AIROSMITH DEVELOPMENT
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October 9th, 2018

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

RE: Notice of Exempt Modification – Antenna Swap for wireless facility located at SOUTH STREET / I-84, MIDDLEBURY, CONNECTICUT – CT03XC028 (lat. 41° 30' 48.64" N, long. - 73° 7' 27.16" W)

Dear Ms. Bachman:

Sprint Spectrum, LP ("Sprint") currently maintains wireless telecommunications antennas at the (71-foot level) on an existing (120-foot self-support tower) at the above-referenced address. The property is owned by the STATE OF CONNECTICUT and the tower is owned by STATE OF CONNECTICUT DEPARTMENT OF PUBLIC SAFETY DIVISION OF STATE POLICE

Sprint's proposed work involves antenna replacement and tower work. Sprint intends to add three (3) new antennas and add six (6) new RRHs onto the tower. All the proposed work is contained within the existing fenced area. Please refer to the attached drawings for site plans prepared by Infinigy Engineering.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Edward St. John, First Selectman and Curt Bosco, Zoning Enforcement Officer of the Town of Middlebury. A copy of this letter is also being sent to Brian Benito the tower manager for STATE OF CONNECTICUT DEPARTMENT OF PUBLIC SAFETY DIVISION OF STATE POLICE, and STATE OF CONNECTICUT who owns the land.

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

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The antennas work is a one-for-one replacement of facility components.

32 Clinton Street, Saratoga Springs, NY 12866
Office 518-306-1733 – Fax 518-306-1711
www.airosmithdevelopment.com

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3. The proposed modifications will include the addition of ground base equipment as depicted on the attached drawings; however, the proposed equipment will not require an extension of the site boundaries.

4. The proposed modifications will not increase noise levels at the facility by six decibels or more.

5. The additional ground based equipment will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard.

For the foregoing reasons, Sprint respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b).

If you have any questions or require any additional information regarding this request, please do not hesitate to give me a call at (518) 350-4222 or email me to aperkowski@airosmithdevelopment.com

Kind Regards,

Arthur Perkowski
Airosmith Development Inc.
32 Clinton Street
Saratoga Springs, NY 12866
518-306-1711 desk & fax
518-871-3707 cell
aperkowski@airosmithdevelopment.com

Attachment

CC: Edward St. John (First Selectman / Middlebury, CT)
BRIAN BENITO (Manager, CT State Police Towers)
Curt Bosco (Zoning Enforcement Officer / Middlebury, CT)
STATE OF CONNECTICUT (Land Owner)

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Street and Apt. No., or PO Box No.: 1212 Whittemore Rd

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Sent To: Curt Bosco

Street and Apt. No., or PO Box No.: 1212 Whittemore Rd

City, State, ZIP+4®: Middlebury CT 06762

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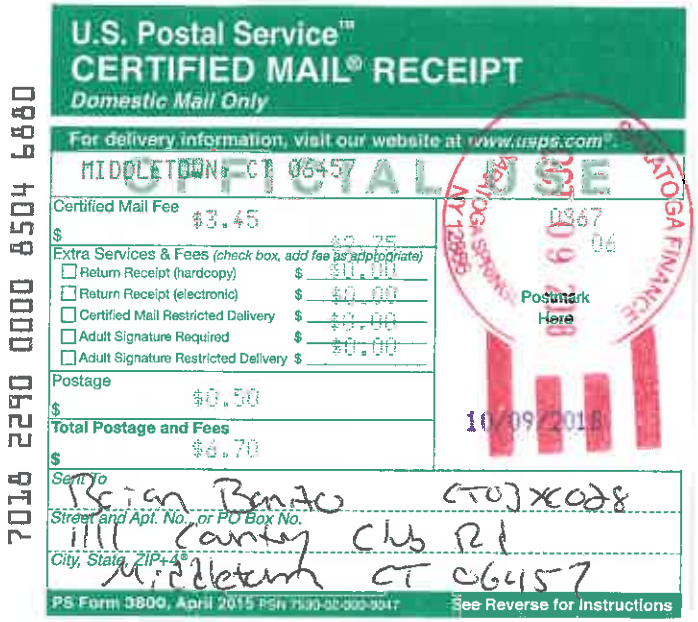

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Total Postage and Fees $6.70

Sent To: Brian Bento CT03X028

Street and Apt. No., or PO Box No.: 111 Country Club Rd

City, State, ZIP+4®: Middletown CT 06457

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Sent To: Darrel Malloy CT03X028

Street and Apt. No., or PO Box No.: 350 Capitol Ave

City, State, ZIP+4®: Hartford CT 06106

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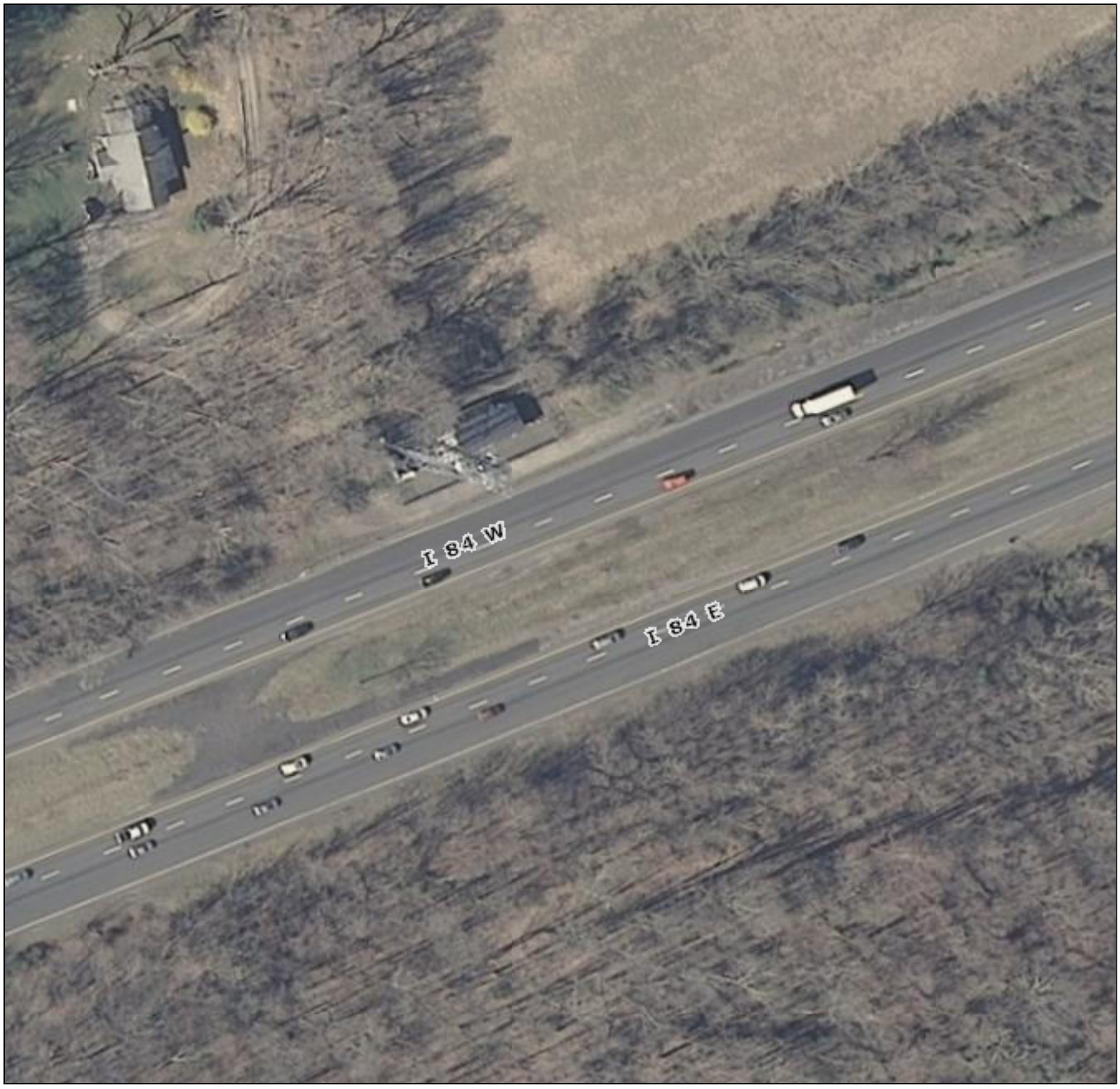
Town of Middlebury

Geographic Information System (GIS)

Date Printed: 10/9/2018



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Middlebury and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 100 feet

0 100 Feet

N W E S

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

SPRINT Existing Facility

Site ID: CT03XC028

(R2E) CT3677 to CT03XC028 South St / I-84 (Police Tower)
South Street / I-84
Middlebury, CT 06762

October 8, 2018

EBI Project Number: 6218006466

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	37.47 %

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

EBI Consulting
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October 8, 2018

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

Emissions Analysis for Site: **CT03XC028 – (R2E) CT3677 to CT03XC028 South St / I-84 (Police Tower)**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **South Street / I-84, Middlebury, 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 **South Street / I-84, Middlebury, 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 antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the Commscope DT465B-2XR** 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 **97 feet** above ground level (AGL) for **Sector A**, **97 feet** above ground level (AGL) for **Sector B** and **97 feet** above ground level (AGL) for Sector C.

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

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**97 feet**	Height (AGL):	**97 feet**	Height (AGL):	**97 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):	8,850.04	ERP (W):	8,850.04	ERP (W):	8,850.04
Antenna A1 MPE%	**4.71 %**	Antenna B1 MPE%	**4.71 %**	Antenna C1 MPE%	**4.71 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	**97 feet**	Height (AGL):	**97 feet**	Height (AGL):	**97 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%	**2.22 %**	Antenna B2 MPE%	**2.22 %**	Antenna C2 MPE%	**2.22 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**6.93 %**
AT&T	2.30 %
Verizon Wireless	19.10 %
MetroPCS	0.96 %
unidentified (from DPS)	6.92 %
DOT	0.13 %
T-Mobile	1.13 %
Site Total MPE %:	**37.47 %**

SPRINT Sector A Total:	6.93 %
SPRINT Sector B Total:	6.93 %
SPRINT Sector C Total:	6.93 %
Site Total:	37.47 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	97	1.90	850 MHz	567	0.33%
Sprint 850 MHz LTE	2	1,093.88	97	9.50	850 MHz	567	1.68%
Sprint 1900 MHz (PCS) CDMA	5	622.47	97	13.51	1900 MHz (PCS)	1000	1.35%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	97	13.51	1900 MHz (PCS)	1000	1.35%
Sprint 2500 MHz (BRS) LTE	8	639.78	97	22.22	2500 MHz (BRS)	1000	2.22%
						Total:	**6.93%**

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:	6.93 %
Sector B:	6.93 %
Sector C:	6.93 %
SPRINT Maximum MPE % (per sector):	6.93 %
Site Total:	37.47 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **37.47 %** 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.

AECOM

Submitted to
Empire Telecom USA, LLC
16 Esquire Road
Billerica, MA 01862

Airosmith Development, Inc.
32 Clinton Street
Saratoga Springs, NY 12866

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
April 9, 2018

DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 160’ SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

AT&T Site Name: CT1078
Sprint Site Name : CT03XC028
Site Address: Intersection of I-84 and South Street
Middlebury, Connecticut

60567641 / EMP-006
60567639 / ASM-006

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and modification of the existing 160' self-supporting lattice tower located west of the intersection of I-84 and South Street in Middlebury, Connecticut.

The structural analysis was conducted in accordance with the 2016 Connecticut State Building Code which includes the TIA-222-G[1] Standard, 2012 International Building Code, the 2016 Connecticut State Building Code Amendments, the AISC[2] Load Resistance Factor Design (LRFD), the ASCE 7[3] design Code, and the Connecticut State Police Requirements which include the TIA/EIA-222-F[4].

The antenna loading considered in the analysis consists of all the existing and proposed antennas, transmission lines and ancillary items as outlined in the Introduction Section of this Report.

The proposed AT&T and Sprint antenna installation is listed below:

Proposed Appurtenances	Carrier	Antenna Center Elevation
Remove:		
(2) Andrew SBNH-1DC6565C Panel Antennas (Alpha and Gamma Sectors) **(1) KMW AM-X-CD-16-65-00T-RET Panel Antenna (Beta Sector)** **(3) TMA Units** **(6) Diplexer Units**	**AT&T (existing)**	**@ 140'**
Install:		
(2) CCI TPA-65R-LCUUUU-H8 Panels (Alpha and Beta Sectors) **(1) Quintel QS66512-3 Panel Antenna (Gamma Sector)** **(3) Ericsson RRUS-32 RRH Units** **(3) Ericsson RRUS-12 RRH Units** **(3) Ericsson A2 Module Units** **(1) Raycap DC6 Surge Suppressor (Squid) Unit**	**AT&T (Proposed)**	**@ 140'**
(3) Commscope DT465B-2XR Panel Antennas **(3) 2x50W 800 MHz RRH Units** **(3) TD-RRH8x20-25 RRH Units** **(1) Hybrid Cable (1-1/4" Outside Diameter Hybriflex Cable)** **(3) Pipe Mount Assemblies (Modeled Commscope Part # PM-SU35-48 Pipe Mount Kits**	**Sprint (Proposed)**	**@97'**

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version G)

2. AISC = American Institute of Steel Construction (14th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2010 Edition)

4. TIA/EIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version F)

1. EXECUTIVE SUMMARY *(continued)*

The results of an initial analysis indicated the existing tower structure did not have enough capacity for the proposed loading conditions. The tower structure requires modifications indicated on sheets SK-1 and SK-2. **Once the modifications indicated on sheets SK-1 and SK-2 are performed, the modified structure with the existing tower anchor bolts and existing foundation are considered structurally adequate with the wind load classification specified herein with the existing and proposed antenna loading.**

The tower deflection (sway) is 0.5175 degrees, and the tower rotation (twist) is 0.2026 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

This analysis is based on:

1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.

2) Tower geometry, member sizes and foundation taken from Tower and Foundation reports prepared by Stainless, Inc. project number 358807 dated December 14, 1993.

3) Soil information taken from geotechnical report prepared by Dr. Clarence Welti, P.E., P.C., dated December 17, 2012.

4) Previous structural analysis and modification performed by AECOM on behalf of Verizon Wireless, project number 60404004, signed and sealed on July 10, 2015.

5) Previous structural analysis performed by AECOM on behalf of Northwest CT Public Safety Communication Center, project number 60492507, signed and sealed on April 26, 2016.

6) Tower Mapping and Inventory of tower performed by D & K Nationwide Communications, Inc., dated March 27, 2016.

7) Previous structural analysis and evaluation performed by AECOM on behalf of Pyramid Network Services, LLC, project number 60509756.21, signed and sealed on February 19, 2017.

8) Proposed AT&T antenna configuration obtained Construction Drawings and Radio Frequency Data Sheet (RFDS) via e-mail dated July 8, 2016.

9) Proposed antenna configuration obtained by Sprint from Construction Drawings dated December 26, 2017 obtained via e-mail.

10) Previous structural analysis and evaluation performed by AECOM on behalf of AT&T project number 60564916 / EMP-002, signed and sealed on January 24, 2018.

11) Previous structural analysis and evaluation performed by AECOM on behalf of Sprint, project number 60558618 / ASM-001, signed and sealed on February 9, 2018.

12) Coax cable orientation as specified in section 6 of this report.

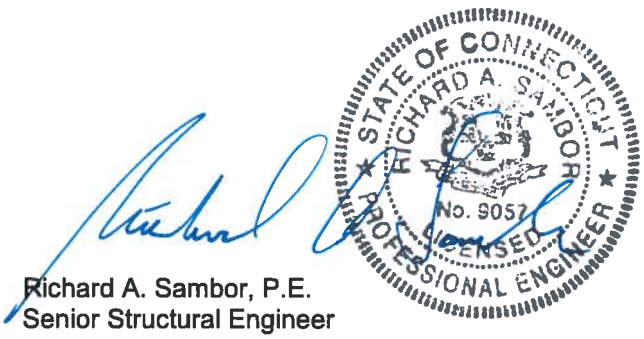
1. EXECUTIVE SUMMARY *(continued)*

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the antenna, cabling and mount configuration used, as well as the physical condition of the tower members, connections and foundations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

AECOM,



Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd
cc: IA, CF/Book – AECOM

2. INTRODUCTION

The subject tower is located west of the intersection of I-84 and South Street in Middlebury, Connecticut. The structure is a self-supporting three-legged 160' steel tapered lattice tower manufactured by Stainless Incorporated.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for Standard for a wind velocity of range of 95 mph to 115 mph (3-second gust) and 50 mph (3-second gust) concurrent with 0.75" ice thickness, considered to increase in thickness with height
- 2012 International Building Code with 2016 Connecticut State Building Code Amendments for a wind speed of 101 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard
- Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice, analyzed under the TIA/EIA-222-F design Standard.

The inventory together with the proposed AT&T and Sprint antenna arrangement is summarized in the table below:

Antenna Type	***Carrier***	***Mount***	***Centerline Elevation***	***Cable***
4' Lightning Rod	D&K – 33 (existing)	Pipe mount above	177'	---
16' Lightning Rod Mounting Pipe	(existing)	None	168'	---
Tower Light	(existing)	None	160'-6"	---
(1) Sinclair SC479-HF1LDF(D00-E6085) Omni Antenna	CSP (Existing)	*Shared with Below Mount*	160'	(1) 1-5/8" AVA Cable
(1) Bird 432E-83I-01 TTA Junction Box (Mounted to Leg)	CSP (Existing)	(1) 6' Side-arm Mount attached to Leg (PSA6)	160'	(1) 1-5/8" AVA Cable (1) 1/2" Coax Cable
(1) Sinclair SC479-HF1LDF(D00I-E6085) (Inverted) Omni Antenna	CSP (Existing)	*Shared with Above Mount*	160'	(1) Jumper Cable from above TTA Unit
(1) 12' Omni Antenna	D&K – 29 (existing)	*Mount Shared with D&K – 21 (below)*	159'	(1) 1-5/8" coax cable
(1) Junction Box	D&K – 30 CSP (existing)	Face Mounted	158'	(1) 1/2" coax cable
(1) Junction Box	D&K – 25 CSP (existing)	*Mount shared with D&K – 18 (below)*	158'	(2) 3/8" coax cables (1) 1/2" coax cable
(1) Sinclair SC479-HF1LDF(D00I-E6085) (Inverted) Omni Antenna	CSP (Existing)	*Mount Shared with 6' Side-arm (PSA6) (above)*	157.5'	(1) 1/2" Jumper from TTA from Above CSP TTA unit @ 160'
(1) 8-Bay 20' Dipole Antenna	D&K – 28 FBI – 3 (existing)	*Mount Shared with D&K – 30 (above)*	157'	(1) 7/8" coax cable

Antenna Type	*Carrier*	*Mount*	*Centerline Elevation*	*Cable*
(1) OGT9-806 Omni*	D&K – 26 CSP-8 (existing)	*Mount Shared with D&K – 19 (below)*	157’	(1) 1-5/8” coax cable*
(1) 4-Bay 20’ Dipole Antenna	D&K – 27 ATF – 2 (existing)	*Mount Shared with D&K – 22 (below)*	155’	(1) 7/8” coax cable
(1) Raycap Distribution Unit (Squid)	D&K – 23 (existing)	1’ Standoff Mounted to Leg	145’	(1) 1-1/4” coax cable
(1) (Inverted) OGT9-806 Omni Antenna *	D&K – 21 CSP-11 (existing)	(2) 8’ Stiff-Arm Mounts	141.3333’	(1) 1-5/8” coax cable
(1) (inverted) Omni	D&K – 22 (existing)	(2) 8’ Stiff-Arm Mounts	141’	(1) 1-5/8” coax cable
(1) (inverted) Omni	D&K – 18 (existing)	(2) 8’ Stiff-Arm Mounts	141’	(1) 1-5/8” coax cable
(1) Radiowaves HD2-4.7 (2 foot dish)	Northwest CT Public Safety (existing)	Mounted to Face	140’	(2) 7/8” AVA5-50FX Heliax Andrew Virtual Air Coaxial Cables
(1) (inverted) Omni	D&K – 20 (existing)	*Shared with below Mount*	139.5’	(1) 1-5/8” coax cable
(1) (inverted) Omni	D&K – 19 (existing)	(1) 10’ Stand-off Arm	139.5’	(1) 1-5/8” coax cable
(2) CCI TPA-65R-LCUUUU-H8 Panels (1 A, 1 B) **(1) Quintel QS66512-3 Panel (1 C)** **(3) RRUS-32 RRH Units** **(3) RRUS-12 RRH Units** **(3) A2 Module Units** **(1) DC6 Squid Unit**	**AT&T (Proposed)**	***See Below Mounts***	**140’**	**(1) Fiber Optic Cable** **(2) DC cables**
(3) Powerwave 7770 (3) TT19-08BP111-001 Twin TMA Units (3) LGP21401 Diplexers (2) SBNH-1D6565C (1 A, 1 B) (1) KMW AM-X-CD-16-65-00T (1 C) (3) RRUS-11 RRH Units (1) Surge Suppressor	AT&T (existing)	(3) T-Frames	140’	(12) 1 1/4” coax cable (1) 3” Flex Conduit with 1 Fiber & 2 DC Cables
(1) Celwave PD1142	D&K – 11 DOT – 4 (existing)	(2) 8’ Stiff-Arm Mounts	120’	(1) 7/8” coax cable
(3) LNX-6515DS-VTM Panel Antennas (3) Smart Bias-T Units (3) EMS RR90-17-02-DP antennas (3) TMA Units	T-Mobile (existing)	(3) 2-Panel Antenna Mounts	119’	(12) 1 5/8” coax cable
(2) 6’ Dishes w/ Ice Shields	D&K – 5 & 6 CSP – 6 & 7 (existing)	(2) Dish Mounts	107’	(2) WEP65 coax cable

Antenna Type	*Carrier*	*Mount*	*Centerline Elevation*	*Cable*
(3) DT465B-2XR Panel Antennas (3) 2x50W 800 MHz RRH Units (3) TD-RRH8x20-25 RRH Units	**Sprint (Proposed)**	**(3) Pipe Mounts attached to Tower (Modeled (3) Commscope PM-SU35-48 Mounts)**	**97'**	**(1) Hybriflex Cable (1-1/4" OD)**
(3) RFS APXVSPP-C-20 Antennas (3) Andrew RRH 800 MHz 2x40W (3) Panasonic RRH 1900 MHz 2x40W	Sprint (existing)	Existing Pipe Mounts w/ (3) Commscope PM-SU35-48 Mounts	97'	(3) Hybriflex cable (1-1/4" OD)
(1) PD10054	D&K-1 CSP – 5 (existing)	1' Standoff Mounted to Leg	82'	(1) 7/8" coax cable
(2) SBNHH-1D65B (1A & 1B) 700 MHz and shared with 2100 MHz (AWS)) (2) 700 MHz RRH Units (1A & 1B) 700 MHz and shared with 2100 MHz (AWS) (2) 2100 MHz (AWS) Units (1A & 1B) 700 MHz and shared with 2100 MHz (AWS) (2) SBNHH-1D65B (1A, 1B) 850 MHz and shared with 1900 MHz (PCS) (1) DB-T1-6Z-8AB-0Z Distribution Box	Verizon (existing)	(2) Antenna Mount Frames (Alpha & Beta Sectors)	75'	(1) 1-5/8" Fiber Optic Cable (HB158-1-08U8-S8J18)

NOTES: Antenna ID Numbering and elevations obtained from Tower Mapping and Existing inventory via tower climb performed by D&K Nationwide Communications, Inc. on March 27, 2016.

"*" indicates future decommissioning of CSP antennas

This structural analysis of the communications tower was performed by AECOM for AT&T and Sprint. The purpose of this analysis was to investigate the structural integrity of the modified tower and existing foundation for existing and proposed antenna loads in compliance with the 2016 Connecticut State Building Code. This analysis was conducted to evaluate stress on the tower and the effect forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with, the TIA-222-G–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2012 International Building Code with 2016 Connecticut State Building Code Amendments and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 7.0.8.3 and used the following conditions for this tower review (following the TIA/EIA-222-G Standard):

- Structure Class 3 – (Essential Communications)
  - NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 3 – (Tower location on top of hill – rolling wind conditions considered)
  - Crest Height used for analysis: (approximate elevations listed below)
    - Tower Base Elevation = 770 feet
    - High point (2 mile Radius) = 800 feet (Ref. Bedlam Hill)
    - Low Point (2 mile Radius) = 389 feet (Ref. Johnson School Building)
    - "H" = (Avg of High/Low) – Base Elevation = 176 feet
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
  - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
  - New Haven County (Wind Speed Range): V = 95 mph - 115 mph (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2012 w/ 2016 CT State Building Code Amendment:
  - (2012) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination of Design Wind Load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed.
  - (2016) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
    - **V.asd = 101 mph** (3-Second Gust) Wind Design Parameter for the Town of Middlebury, Connecticut for Risk Category four (IV) for essential communications (Connecticut State Police).

LOAD CONDITION 1 = 101 MPH (3-SECOND GUST) WIND LOAD (WITHOUT ICE) + TOWER DEAD LOAD
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **0.75 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

The below load condition implements the design requirements of the Connecticut State Police for the tower structures deflection limits with the allowable deflection limit of the combination of the tower's sway (deflection) and twist (rotation) under the TIA-222-F design Standard. This design limit required the design combined value of sway (deflection) and twist (rotation) to be under 0.75 degrees following the TIA-222-F design Standard.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

Load Condition 3 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Seismic event consideration factors/values for design:

- S.s = 0.191 (2016 CT State Building Code – Location Specific Value)
- S.1 = 0.064 (2016 CT State Building Code – Location Specific Value)
- Site Classification = "D" – from Geotechnical Report
- Seismic Design Category = "C" – (2012 International Building Code)
- F.a = 1.6 (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- F.v = 2.4 (Obtained from TIA-222-G Table 2-13 Considering above conditions)

Strength Limit State Load Combinations (TIA-222-G Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. ***1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind load without ice***
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead weight of ice due to factored ice thickness + 1.0 Concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

NOTE 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

NOTE 2: The above "Dead Load Guy Assemblies" are not considered as part of the analysis and are considered as a value of zero.

NOTE 3: The "Load effects due to temperature" do not apply for structures that are self-sustaining (from the TIA-222-G Standard)

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the existing tower structure were evaluated to compare with strength design in accordance with AISC (LRFD). The results of an initial analysis indicated that the existing tower structure did not have enough capacity to support the proposed loading conditions. The tower structure requires modifications shown on sheets SK-1 and SK-2. **Once the modifications indicated on sheets SK-1 and SK-2 are performed, the modified tower structure, existing anchor bolts and existing foundation are considered structurally adequate with the wind load specification with the existing and proposed antenna loading included herein.**

The tower sway (deflection) is 0.5175 degrees and the tower twist (rotation) is 0.2026 degrees. These figures are within the Connecticut State Police specification of 0.75 degrees for sway and twist.

Tower Base Reactions:

Description	Factored Loads (TIA-222-G)
Axial Load (kips)	59
Pier Compression (kips)	444
Pier Uplift (kips)	389
Overall Overturning (kip-ft)	8440
Overall Shear (kips)	107
Shear per Leg (kips)	59

Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Critical Component Size	Controlling Elevation	Stress (% capacity)	Pass/Fail
Tower Leg (T10)	HSS 6.875x0.5 with (3) 2x5/8 Welded Bars	0’ – 25’	86.2	Pass
Diagonal (T10)	(2)L4x3x3/8 Back to Back Angles	0’ – 25’	96.4	Pass
Horizontal (T10)	L4x4x1/2	0’ – 25’	90.0	Pass
Top Girt (T8)	L4x4x1/4	37.5’ – 50’	89.7	Pass
Redundant Horizontal Bracing (T9)	L2x2x5/16	25’ – 37.5’	42.1	Pass
Redundant Diagonal Bracing (T9)	L2x2x5/16	25’ – 37.5’	80.9	Pass
Inner Bracing (T7)	L2-1/2x2x3/16	50’ – 58.333’	12.9	Pass
Tower connection Bolts	(2) A325X 5/8” Bolts (Horizontal)	25’	90.0	Pass

Foundation Summary:

Component	Required	Computed	% Capacity	Pass/Fail
Anchor Rod Capacity (TIA-222-G – 4.9.9)	Ratio < 1.0	0.938	93.8 %	Pass
Overturning Moment Factor of Safety TIA-222-G Conditions	Resist OT * (0.75) Reduction Factor (TIA-222-G – Section 9.4.1) 11745 Kip*ft	9084.71	77.5 %	Pass
Bearing Pressure (TIA-222-G Conditions)	6.750 ksf max	2.2388 ksf	33.2 %	Pass
Footing Pad Flexure (Steel Reinforcement)	Required < 53.04 in^2	51.9677 in^2	98.0 %	Pass

4. FINDINGS AND EVALUATION (cont.)

Maximum Deformations – Proposed Condition

ANSI/TIA-222-G Section 2.8.2 - Limit State Deformations

1. A rotation of 4 degrees about the vertical axis (twist) or any horizontal axis (sway) of the structure
2. A horizontal displacement (in feet) of 3% of the height of the structure.

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load	0.1142	0.2143	4.0	4.8

Tower Twist & Sway at Top (Connecticut State Police Requirements - TIA-222-F):

Description	Current	Total	Allowable
Tower Twist (degrees)	0.2026	0.7201	0.750
Tower Sway (degrees)	0.5175		

5. CONCLUSIONS

The results of an initial analysis indicated the existing tower structure did not have enough capacity for the proposed loading conditions. The tower structure requires modifications indicated on sheets SK-1 and SK-2. **Once the modifications indicated on sheets SK-1 and SK-2 are performed, the modified structure with the existing tower anchor bolts and existing foundation are considered structurally adequate with the wind load classification specified herein with the existing and proposed antenna loading.**

The tower deflection (sway) is 0.5175 degrees, and the tower rotation (twist) is 0.2026 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

Limitations/Assumptions:

This report is based on the following:

1) Tower inventory as listed in this report.

2) Tower is properly installed and maintained.

3) All members are as specified in the original design documents and are in good condition.

4) All required members are in place.

5) All bolts are in place and are properly tightened.

6) Tower is in plumb condition.

7) All member protective coatings are in good condition.

8) All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

9) Foundations are in good condition without defects and were properly constructed to support original design loads as specified in the original design documents.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA-222-G Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

REINFORCEMENT DRAWINGS SK-1 AND SK-2

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CONNECTICUT STATE BUILDING, SUPPLEMENTS AND AMENDMENTS AND LIFE SAFETY CODES.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND NOTES IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND NOTES FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING OPERATING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER. THERE SHALL BE NO INTERRUPTION OF OPERATION WITHOUT TIMELY COORDINATION WITH AND APPROVAL BY THE VARIOUS COMMUNICATIONS OPERATORS.
8. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
10. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
11. THE 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. SUBMIT ANY DISCREPANCIES FROM THE DRAWINGS TO THE ARCHITECT.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
14. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE DOCUMENTS ARE BASED ON ORIGINAL TOWER CONSTRUCTION DRAWINGS BY STAINLESS INC., DATED DECEMBER 1995, AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.

STRUCTURAL NOTES

STRUCTURAL STEEL MATERIAL:

STRUCTURAL STEEL BEAMS, CHANNELS, PLATES..... A36
STRUCTURAL ANGLES..... A36 & A529-50
EXISTING TOWER LEG ..... A 572-Gr. 50 & Gr. 60

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 5/8" DIA. A325-N BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

COMMENCEMENT OF WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN A WIND.

INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

OWNER WILL SUPPLY THE SERVICES OF A SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS WILL BE PROVIDED TO THE OWNER, BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.

Project No.:	ASM006/EMP008
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

Sprint AT&T

SITE ADDRESS: CSP #20, INTERSECTION OF I-84W & SOUTH ST
MIDDLEBURY, CONNECTICUT

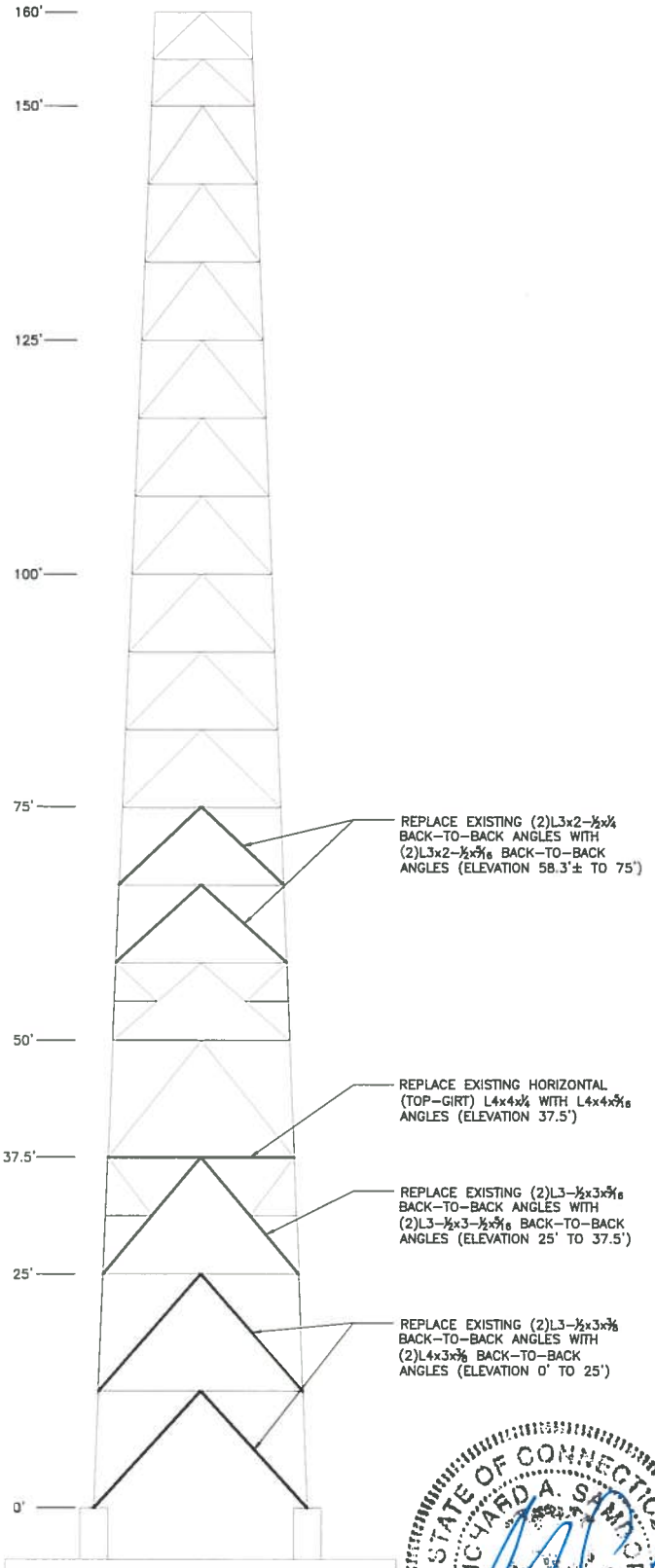
REV.	DATE:	DESCRIPTION

Scale: NONE | Date: 04/09/18
Job No. | File No.

Dwg. No. SK-1

Dwg. 1 of 2

NOTE:
1. REFER TO STRUCTURAL NOTES ON SK-1 FOR INFORMATION.
2. REINFORCEMENT OF TOWER IS REQUIRED FOR ALL 3 SIDES OF EXISTING TOWER STRUCTURE.
3. CONNECTION BOLTS THAT ARE REMOVED DURING MEMBER REPLACEMENT SHALL NOT BE RE-USED FOR CONNECTING REPLACEMENT MEMBERS.
4. CONTRACTOR SHALL VERIFY INFORMATION SHOWN ON THIS SHEET PRIOR TO ORDERING MATERIALS.
5. ANGLE MEMBER REPLACEMENT INDICATED ON THIS SHEET SHALL HAVE A MINIMUM YIELD STRESS OF 50 KSI UNLESS NOTED OTHERWISE.



1 / SK-4 **TOWER ELEVATION**
SCALE: 1" = 20'-0"

STATE OF CONNECTICUT ★ RICHARD A. SAMPSON ★ No. 20 LICENSED PROFESSIONAL ENGINEER

Project No.:	ASM006/EMP006
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

Sprint AT&T

SITE ADDRESS:
CSP #20, INTERSECTION OF I-84W & SOUTH ST
MIDDLEBURY, CONNECTICUT

REV.	DATE:	DESCRIPTION

Scale: | Date: 04/06/18
Job No.VZ5-190 | File No.

Dwg. No. SK-2

SEISMIC BASE SHEAR ANALYSIS

AECOM

Seismic (Vs) Base Shear Implementing TIA–222-G, IBC 2012 & Connecticut State Building Code of 2016

Calculation of Seismic Base Shear Implementing TIA-222-G, IBC 2012 & & CT State Building Code 2016.

Location: Middlebury, CT -Site Class "D"

$S_{DS} = \frac{2}{3} F_A S_S$, where $S_S = 0.191$ and $F_A = 1.6$ $S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.6 * 0.191 = 0.204$

$S_{D1} = \frac{2}{3} F_V S_1$, where $S_1 = 0.064$ and $F_V = 2.4$ $S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 2.4 * 0.064 = 0.102$

TIA-222-G SECTION 2.7 EARTHQUAKE LOADS (PROCEDURES):

1. Importance Factor "I" (tables 2-3 TIA-222-G) = 1.5 (Structure Class 3)

ANSI/TIA-222-G 2.7.7.1 (TOTAL BASE SEISMIC SHEAR (Vs)

W=DL TOWER	=	34.109	Kips
W=Antennas/Mounts	=	9.778	Kips
W=Cables	=	5.937	Kips
		49.824	Kips = WT Total = "W"

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.204 * 49.824 kips * 1.5}{3.0} = 5.0820\ kips,$$ where R = 3.0 for Lattice Tower

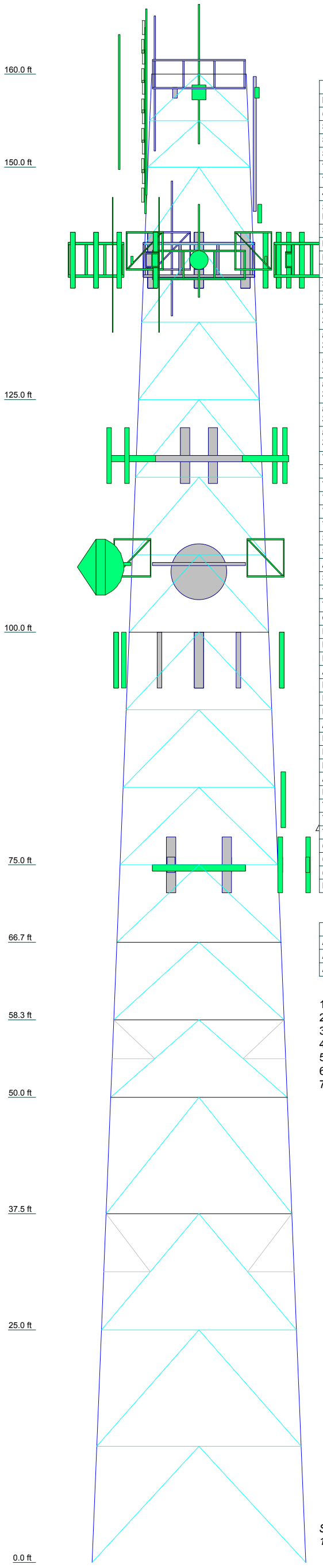
$$V_{S.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.102 * 49.824 kips * 1.5}{3.0} = 1.271 \quad kips$$

*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less that the base shear of wind on structure.

$1.2 * DL + 1.0\ E < 1.2\ DL + 1.6\ W$, (107 Kips), therefore seismic effect on structure Does NOT control Design.

TNX TOWER INPUT / OUTPUT SUMMARY

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs	P.5x.250			P5x0.3 w/ (3) 1.5x5/8 Plates		P5x0.4 w/ (3) 1.5x5/8 Plates	HSS5x.4	HSS6.875x.4		HSS6.875x0.5 w/ (3) 2x5/8 Bars
Leg Grade	A500-50				A572-50			A514-60		A500-50
Diagonals	2L2 1/2x2 1/2x5/16	2L2 1/2x2x3/16	2L2 1/2x2 1/2x5/16	2L3x2 1/2x1/4	2L3x2 1/2x5/16		2L3x3x5/16	2L3 1/2x3x3/8	2L3 1/2x3 1/2x5/16	2L4x3x3/8
Diagonal Grade	A36			A529-50			A36			A529-50
Top Girts	N.A.	L2 1/2x2 1/2x3/16	L3x3x5/16	L3x3x1/4	N.A.	L3x3x1/2	L2x2x5/16	N.A.	L2x2x5/16	N.A.
Horizontals	L3x3x1/4			L3x3x1/2			L2x2x5/16	L4x4x1/4		L4x4x1/2
Red. Horizontals	L3x3x1/4		N.A.	L3x3x1/4			N.A.	N.A.	L2x2x5/16	N.A.
Red. Diagonals	N.A.		N.A.	N.A.			L2x2x5/16	N.A.	L2x2x5/16	N.A.
Inner Bracing	N.A.	L2 1/2x2x3/16		L2 1/2x2x3/16			L2 1/2x2 1/2x3/16			
Face Width (ft) 23	10.2	11	13	15	17	17.6667	18.3333	19	20	21
# Panels @ (ft)	2 @ 5			12 @ 8.33333						4 @ 12.5
Weight (lb) 34108.8	1181.7	2323.9	3860.0	5084.2	2103.3	2141.0	2316.3	3003.5	3416.1	8678.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x21' (DNK-33)	160	SC479-HF1LDF (DNK-19)	139.5
(PSA6) 6' Side-Arm (CSP)	160	10' PCS Frame (1) (DNK-19 (3 antennas Attached - 19,20,26))	139.5
SC479-HF1LDF(D00-E6085) (CSP)	160	SC479-HF1LDF (DNK-20)	139.5
SC479-HF1LDF(D00I-E6085) (Inverted) (CSP)	160 - 145	PD1142-1 (DNK-11)	120
SC479-HF1LDF (DNK-29)	159	DSM2 (T-Mobile DNK 8-10)	119
TMA 432-83H-01T (DNK-25)	158	DSM2 (T-Mobile DNK 8-10)	119
TMA 432-83H-01T (DNK-30)	158	DSM2 (T-Mobile DNK 8-10)	119
432E-83I-01T TTA Unit (CSP)	158	RR90-17-02DP (T-Mobile DNK 8-10)	119
SC479-HF1LDF(D00I-E6085) (DNK-32 - Troop L RX (PNS-Proposed 01272017))	157.5	LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile DNK 8-10)	119
SC479-HF1LDF (DNK-26)	157	LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile DNK 8-10)	119
DB228-A (DNK-28)	157	LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile DNK 8-10)	119
DB304-A (DNK-27)	155	RR90-17-02DP (T-Mobile DNK 8-10)	119
DC6-48-60-18-8F (Squid) Suppressor (DNK-23)	145	RR90-17-02DP (T-Mobile DNK 8-10)	119
SC479-HF1LDF (DNK-21)	141.25	8' Stiff-Arm (DNK-7)	108
SC479-HF1LDF (DNK-18)	141	8' Stiff-Arm (DNK-7)	108
8' Stiff-Arm (DNK-18 (4 antennas Attached - 18, 24, 25, Sinclair))	141	4"x96"x72" Ice Canopy (DNK-5)	107.5
8' Stiff-Arm (DNK-18 (4 antennas Attached - 18, 24, 25, Sinclair))	141	4"x96"x72" Ice Canopy (DNK-6)	107.5
8' Stiff-Arm (DNK-21 (2 antennas Attached - 21,29))	141	6' w/ Radome (DNK-6 / CSP-7)	107
8' Stiff-Arm (DNK-21 (2 antennas Attached - 21,29))	141	6' w/ Radome (DNK-5 / CSP-6)	106.5
8' Stiff-Arm (DNK-22 (5 antennas Attached - 22,27,31,32,33))	141	PM-SU35-48 - Pipe Mount 48" (Sprint DNK 2-4)	97
8' Stiff-Arm (DNK-22 (5 antennas Attached - 22,27,31,32,33))	141	PM-SU35-48 - Pipe Mount 48" (Sprint DNK 2-4)	97
T-Frame (ATT DNK 12-17)	140	RRH 1900 MHz 2x40W (Sprint DNK 2-4)	97
T-Frame (ATT DNK 12-17)	140	RRH 1900 MHz 2x40W (Sprint DNK 2-4)	97
T-Frame (ATT DNK 12-17)	140	RRH 800MHz 2x50W (Sprint)	97
7770.00 (ATT DNK 12-17)	140	RRH 800MHz 2x50W (Sprint)	97
7770.00 (ATT DNK 12-17)	140	RRH 800MHz 2x50W (Sprint)	97
7770.00 (ATT DNK 12-17)	140	RRH 800MHz 2x50W (Sprint DNK 2-4)	97
SBNH-1D6565C (ATT DNK 12-17)	140	DT465B-2XR-V2 Panels (Commscope) (Sprint)	97
SBNH-1D6565C (ATT DNK 12-17)	140	DT465B-2XR-V2 Panels (Commscope) (Sprint)	97
AM-X-CD-16-65-00T-RET (6') (ATT DNK 12-17)	140	DT465B-2XR-V2 Panels (Commscope) (Sprint)	97
Surge Suppressor (ATT DNK 12-17)	140	RRH 800MHz 2x50W (Sprint DNK 2-4)	97
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	140	RRH 800MHz 2x50W (Sprint DNK 2-4)	97
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	140	TD-RRH8x20 (Sprint)	97
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	140	TD-RRH8x20 (Sprint)	97
QS66512-3 Quintel Panel (ATT)	140	TD-RRH8x20 (Sprint)	97
RRUS-32 (ATT)	140	RRH 1900 MHz 2x40W (Sprint DNK 2-4)	97
RRUS-12 (ATT)	140	APXVSPP18-C-A20 (Sprint DNK 2-4)	97
RRUS-11 (ATT DNK 12-17)	140	APXVSPP18-C-A20 (Sprint DNK 2-4)	97
A2 Module Unit (ATT)	140	PM-SU35-48 - Pipe Mount 48" (Sprint)	97
RRUS-32 (ATT)	140	PM-SU35-48 - Pipe Mount 48" (Sprint)	97
RRUS-12 (ATT)	140	PM-SU35-48 - Pipe Mount 48" (Sprint)	97
RRUS-11 (ATT DNK 12-17)	140	APXVSPP18-C-A20 (Sprint DNK 2-4)	97
A2 Module Unit (ATT)	140	PM-SU35-48 - Pipe Mount 48" (Sprint DNK 2-4)	97
RRUS-32 (ATT)	140	16x16 Panel 19dBi 2.45GHz ISM (DNK-1)	82
RRUS-12 (ATT)	140	1' Side Mount Standoff (DNK-1)	82
RRUS-11 (ATT DNK 12-17)	140	SBNHH-1D65B (VZW-700AWS)	75
A2 Module Unit (ATT)	140	RH_2x60-07-L (700 MHz) (VZW)	75
DC6-48-60-18-8F (Squid) Suppressor (ATT)	140	SBNHH-1D65B (VZW-850PCS)	75
TT19-08BP111-001 TMA's (ATT DNK 12-17)	140	5' T-arm (VZW)	75
TT19-08BP111-001 TMA's (ATT DNK 12-17)	140	RRH_2x60-AWS (VZW)	75
TT19-08BP111-001 TMA's (ATT DNK 12-17)	140	SBNHH-1D65B (VZW-700AWS)	75
(2) LGP21401 Diplexer (ATT DNK 12-17)	140	RRH_2x60-AWS (VZW)	75
(2) LGP21401 Diplexer (ATT DNK 12-17)	140	5' T-arm (VZW)	75
(2) LGP21401 Diplexer (ATT DNK 12-17)	140	RH_2x60-07-L (700 MHz) (VZW)	75
HPD2-4.7 (NWCT)	140	SBNHH-1D65B (VZW-850PCS)	75
		DC6-48-60-18-8F (VZW)	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A514-60	60 ksi	80 ksi
A572-50	50 ksi	65 ksi			

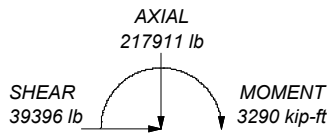
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 3 with Crest Height of 176.00 ft
7. TOWER RATING: 96.4%

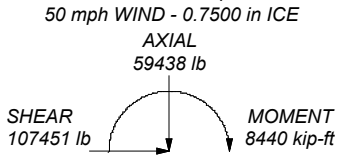
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 443539 lb
SHEAR: 58923 lb

UPLIFT: -388871 lb
SHEAR: 53656 lb



TORQUE 39 kip-ft
50 mph WIND - 0.7500 in ICE

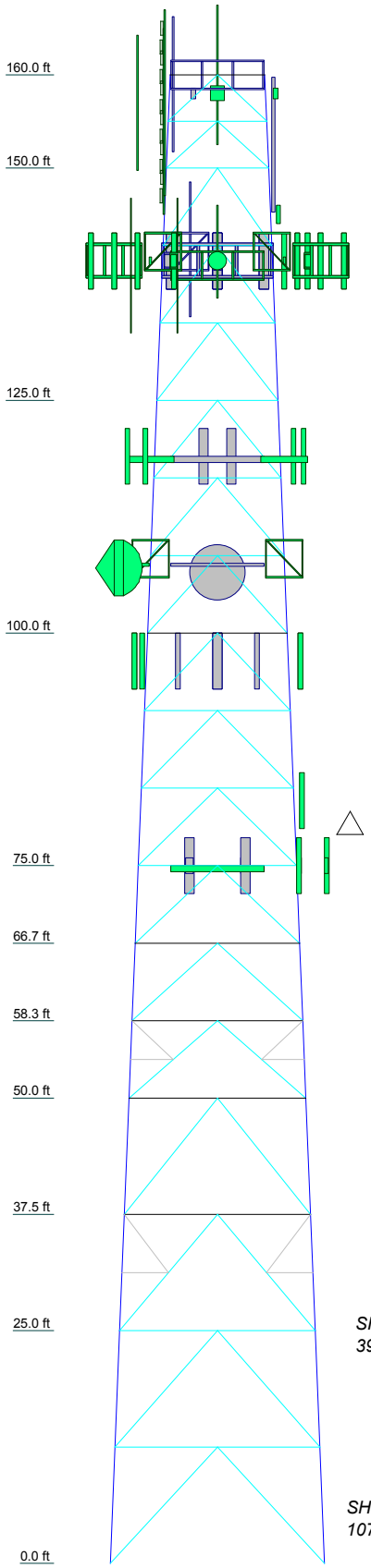


TORQUE 122 kip-ft
REACTIONS - 93 mph WIND

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***160' Self Support Lattice - CSP #20***			
Project: ***Structural Analysis / Tower MODification***			
Client: Empire Telecom (AT&T) / EMP-006 / Airosmith (Sprint) ASM-006	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 04/02/18	Scale: NTS	
Path:		Dwg No. E-1	

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	HSS6.875x0.5 w/ (3) 2x5/8 Bars	HSS6.875x.4		HSS5x.4	A		P5x0.3 w/ (3) 1.5x5/8 Plates		P.5x.250	
Leg Grade	A500-50	A514-60			A572-50			A500-50		
Diagonals	2L4x3x3/8	B	2L3 1/2x3x3/8	2L3x3x5/16	2L3x2 1/2x5/16		2L3x2 1/2x1/4	2L2 1/2x2 1/2x5/16	2L2 1/2x2x3/16	
Diagonal Grade	A529-50		A36		A529-50			A36		
Top Girts	N.A.	L4x4x5/16	L4x4x1/4	L3x3x1/2	N.A.		L3x3x1/4	N.A.		L3x3x1/4
Horizontals	L4x4x1/2		N.A.				L3x3x1/2	L3x3x5/16	L2 1/2x2 1/2x3/16	L3x3x1/4
Red. Horizontals	N.A.	L2x2x5/16	N.A.	L2x2x5/16				N.A.		
Red. Diagonals	N.A.	L2x2x5/16	N.A.	L2x2x5/16				N.A.		
Inner Bracing	L2 1/2x2 1/2x3/16						L2 1/2x2x3/16		N.A.	
Face Width (ft) 23	21	20	19	18.3333	17.6667	17	15	13	11	10.2
# Panels @ (ft)	4 @ 12.5						12 @ 8.33333			2 @ 5
Weight (lb) 34108.8	8678.7	3416.1	3003.5	2316.3	2141.0	2103.3	5084.2	3860.0	2323.9	1181.7



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P5x0.4 w/ (3) 1.5x5/8 Plates	B	2L3 1/2x3 1/2x5/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A514-60	60 ksi	80 ksi
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

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5. Tower Structure Class III.
6. Topographic Category 3 with Crest Height of 176.00 ft
7. TOWER RATING: 96.4%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 443539 lb
SHEAR: 58923 lb

UPLIFT: -388871 lb
SHEAR: 53656 lb

AXIAL 217911 lb
SHEAR 39396 lb *MOMENT 3290 kip-ft*
TORQUE 39 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 59438 lb
SHEAR 107451 lb *MOMENT 8440 kip-ft*
TORQUE 122 kip-ft
REACTIONS - 93 mph WIND

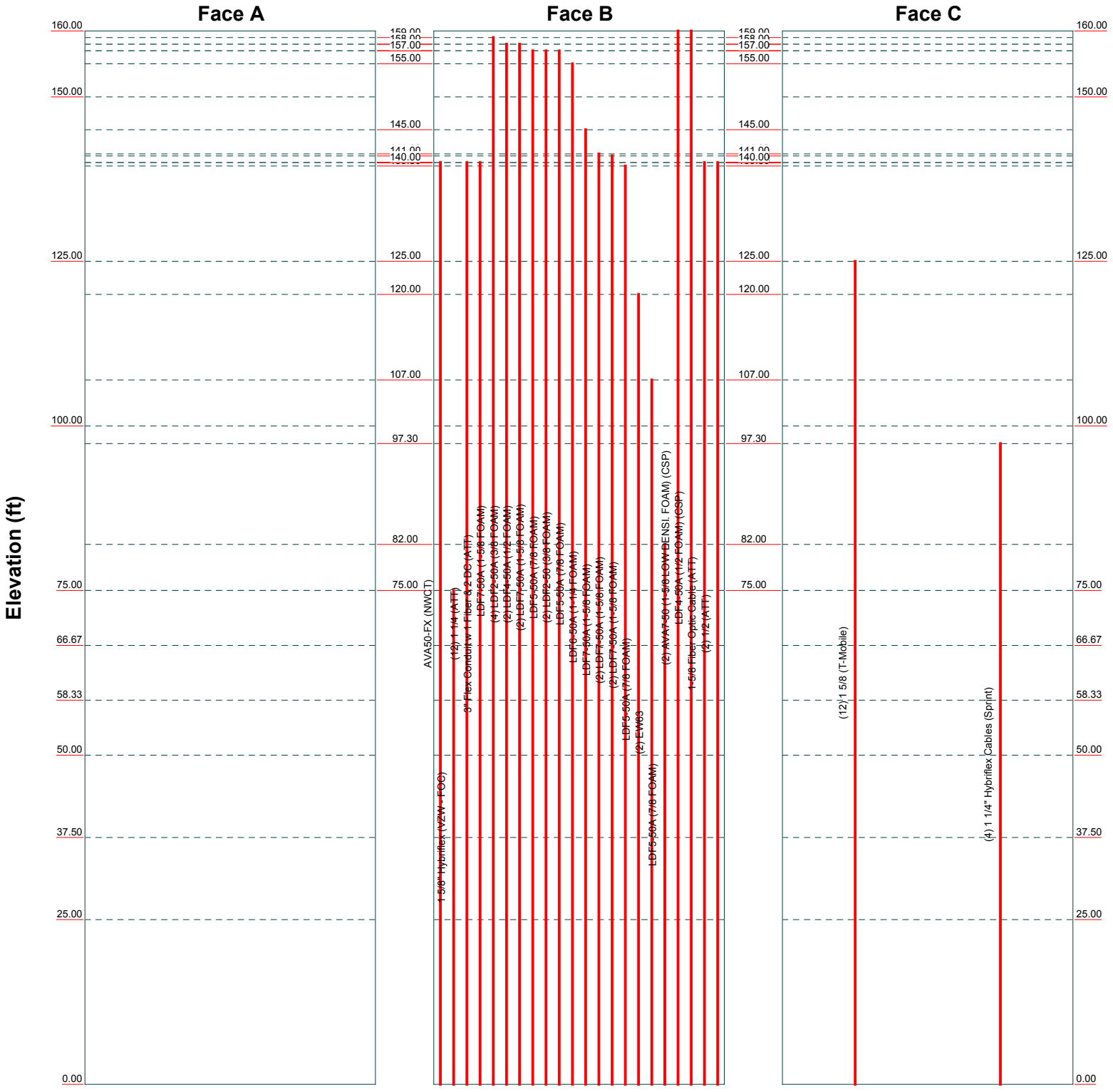
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***160' Self Support Lattice - CSP #20***
Project: ***Structural Analysis / Tower MODification***
Client: Empire Telecom (AT&T) / EMP-006 / Airosmith (Sprint) ASM-006 | Drawn by: MCD | App'd:
Code: TIA-222-G | Date: 04/02/18 | Scale: NTS
Path: | Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
0' - 160'

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



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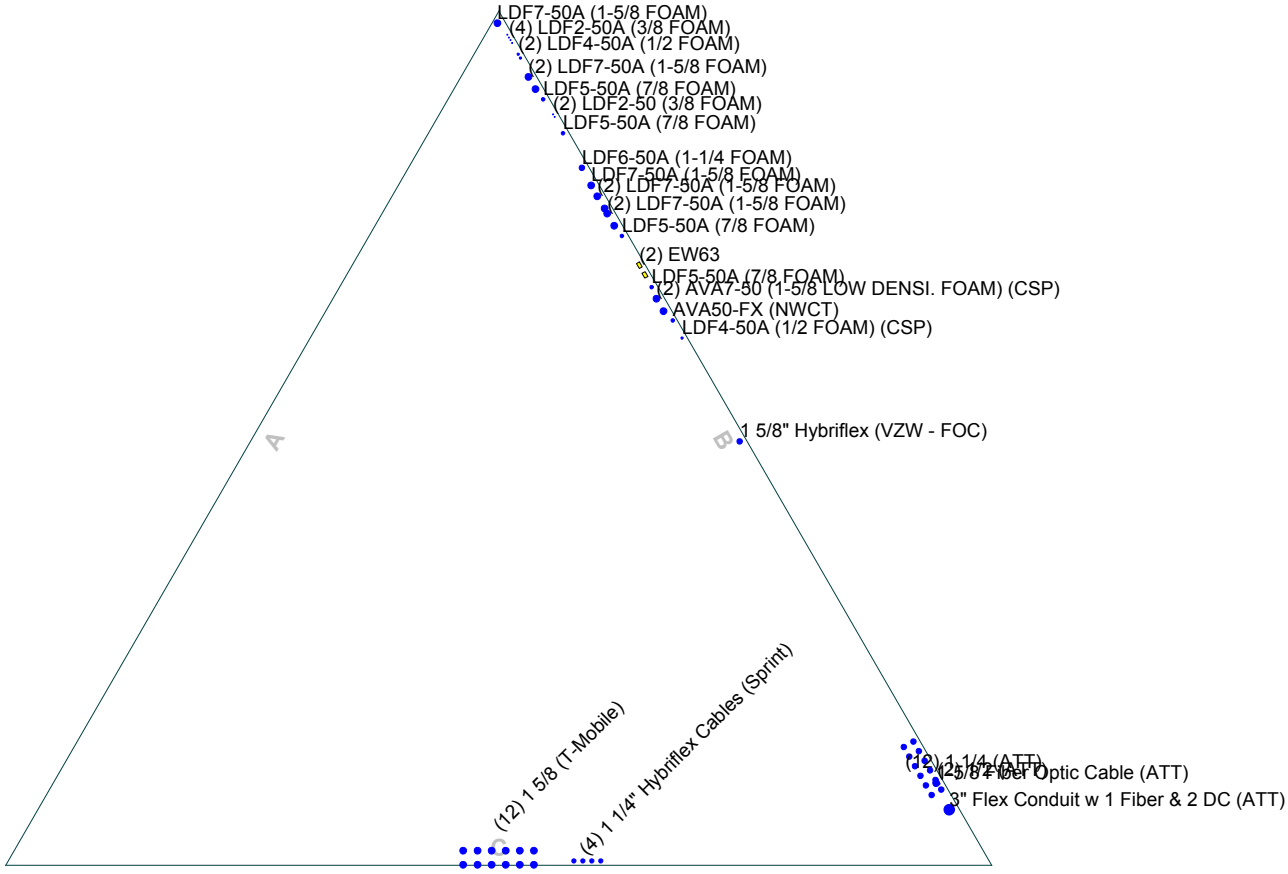
Code:	TIA-222-G	Date: 04/02/18	Scale: NTS
Path:			Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face



(12) 1-1/4 Coax Cables
(1) 3" Flex Conduit w/ 1 F.O.C. & 2 DC Cables
(2) 1/2" (Proposed) DC Cables
(1) 1-5/8" F.O.C (Proposed)

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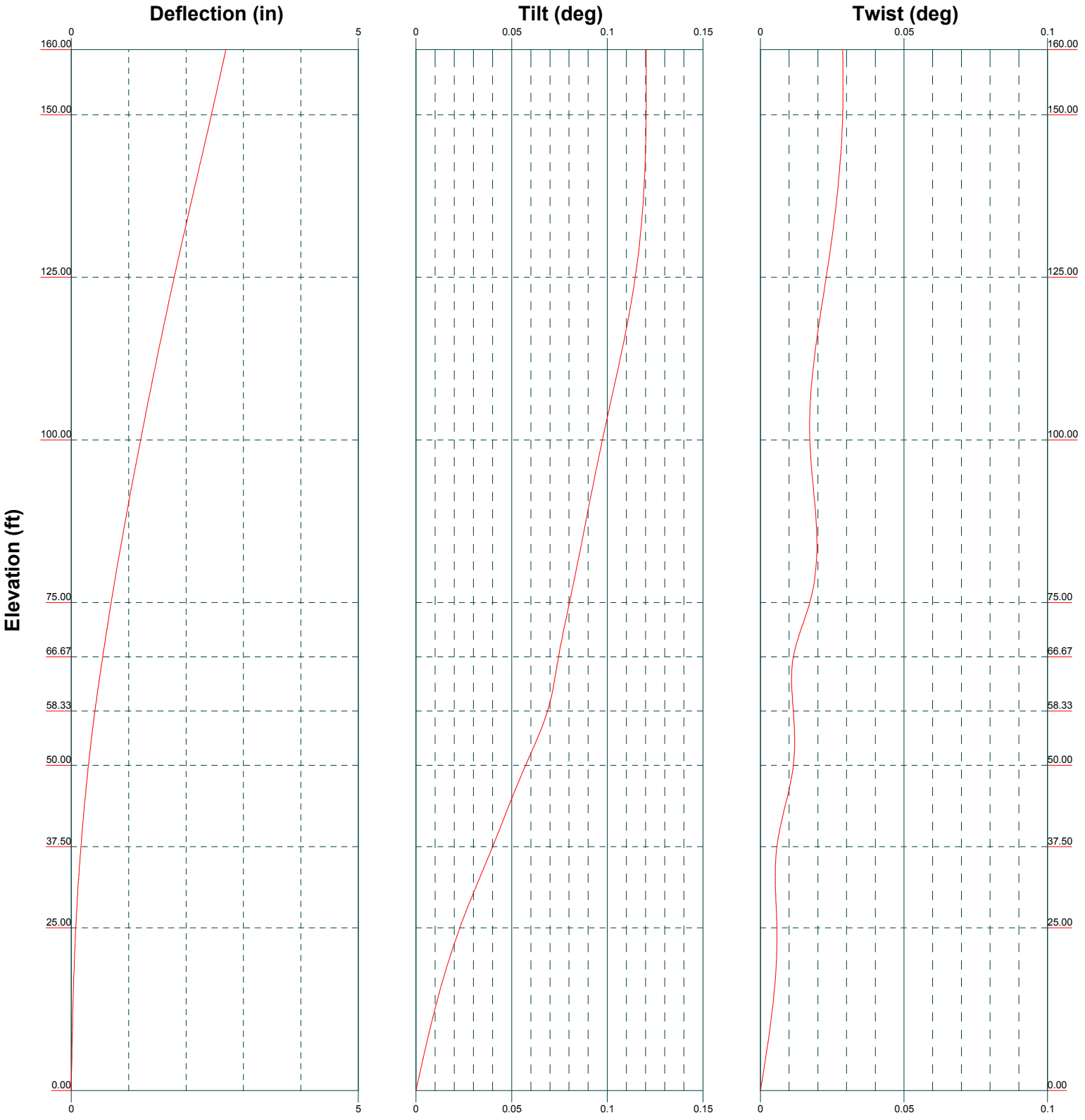
Job:	***160' Self Support Lattice - CSP #20***		
Project:	***Structural Analysis / Tower MODification***		
Client:	Empire Telecom (AT&T) / EMP-006 / Airosmith (Sprint) ASM-006	Drawn by: MCD	App'd:
Code:	TIA-222-G	Date: 04/02/18	Scale: NTS
Path:			Dwg No. E-7

TNX TOWER DEFLECTION, TILT, AND TWIST

TIA-222-G - Service - 60 mph

Maximum Values



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Job: ***160' Self Support Lattice - CSP #20***			
Project: ***Structural Analysis / Tower MODification***			
Client: Empire Telecom (AT&T) / EMP-006 / Airosmith (Sprint) ASM-006		Drawn by: MCD	App'd:
Code: TIA-222-G		Date: 04/02/18	Scale: NTS
Path:			Dwg No. E-5

TNX TOWER DETAILED OUTPUT

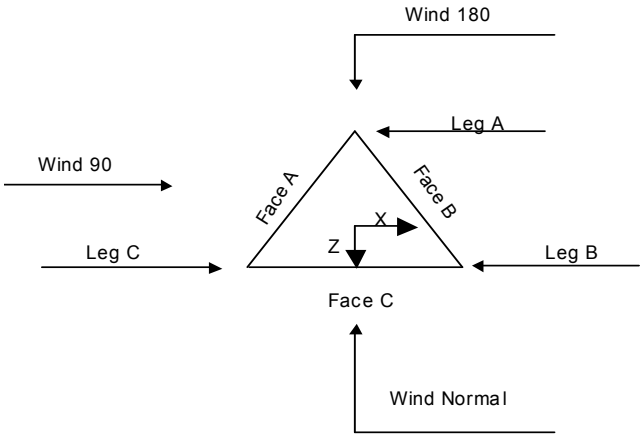
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 160.00 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 10.20 ft at the top and 23.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class III.
Exposure Category C.
Topographic Category 3.
Crest Height 176.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	160.00-150.00			10.20	1	10.00
T2	150.00-125.00			11.00	1	25.00
T3	125.00-100.00			13.00	1	25.00
T4	100.00-75.00			15.00	1	25.00
T5	75.00-66.67			17.00	1	8.33
T6	66.67-58.33			17.67	1	8.33
T7	58.33-50.00			18.33	1	8.33
T8	50.00-37.50			19.00	1	12.50
T9	37.50-25.00			20.00	1	12.50
T10	25.00-0.00			21.00	1	25.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	160.00-150.00	5.00	K Brace Down	No	Yes	0.0000	0.0000
T2	150.00-125.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	125.00-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	75.00-66.67	8.33	K Brace Down	No	Yes	0.0000	0.0000

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
T6	66.67-58.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T7	58.33-50.00	8.33	K1 Down	No	Yes	0.0000	0.0000
T8	50.00-37.50	12.50	K Brace Down	No	Yes	0.0000	0.0000
T9	37.50-25.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T10	25.00-0.00	12.50	K Brace 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 160.00-150.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T2 150.00-125.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T3 125.00-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 100.00-75.00	Arbitrary Shape	P5x0.3 w/ (3) 1.5x5/8 Plates	A500-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4	A36 (36 ksi)
T5 75.00-66.67	Arbitrary Shape	P5x0.4 w/ (3) 1.5x5/8 Plates	A572-50 (50 ksi)	Double Angle	2L3x2 1/2x5/16	A529-50 (50 ksi)
T6 66.67-58.33	Arbitrary Shape	P5x0.4 w/ (3) 1.5x5/8 Plates	A572-50 (50 ksi)	Double Angle	2L3x2 1/2x5/16	A529-50 (50 ksi)
T7 58.33-50.00	Pipe	HSS5x.4	A514-60 (60 ksi)	Double Angle	2L3x3x5/16	A36 (36 ksi)
T8 50.00-37.50	Pipe	HSS6.875x.4	A514-60 (60 ksi)	Double Angle	2L3 1/2x3x3/8	A36 (36 ksi)
T9 37.50-25.00	Pipe	HSS6.875x.4	A514-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16	A529-50 (50 ksi)
T10 25.00-0.00	Arbitrary Shape	HSS6.875x0.5 w/ (3) 2x5/8 Bars	A500-50 (50 ksi)	Double Angle	2L4x3x3/8	A529-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 160.00-150.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36M-50 (50 ksi)
T4 100.00-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 66.67-58.33	Single Angle	L3x3x1/2	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 58.33-50.00	Single Angle	L3x3x1/2	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 50.00-37.50	Single Angle	L4x4x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 37.50-25.00	Single Angle	L4x4x5/16	A529-50 (50 ksi)	Single Angle		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 160.00-150.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T2 150.00-125.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 125.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T4 100.00-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T5 75.00-66.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T6 66.67-58.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T7 58.33-50.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T8 50.00-37.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T9 37.50-25.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T10 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/2	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 125.00-100.00	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T4 100.00-75.00	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 75.00-66.67	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 66.67-58.33	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 58.33-50.00	Equal Angle		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-37.50	Equal Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 37.50-25.00	Equal Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 25.00-0.00	Solid Round		A36 (36 ksi)	Single 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
T7 58.33-50.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2x2x5/16 L2x2x5/16	1 1
T9 37.50-25.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Single Angle	L2x2x5/16 L2x2x5/16	1 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 160.00-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	36.0000
T2 150.00-125.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T3 125.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T4 100.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T5 75.00-66.67	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T6 66.67-58.33	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T7 58.33-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.03	0.0000	36.0000	36.0000
T8 50.00-37.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T9 37.50-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1.03	0.0000	36.0000	36.0000
T10 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	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 160.00-150.00	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	1 1
T2 150.00-125.00	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	1 1
T3 125.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	1 1
T4 100.00-75.00	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	1 1
T5 75.00-66.67	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	1 1
T6 66.67-58.33	Yes	Yes	1	1 1	1 1	1 1	1 1	0.65 0.65	0.65 0.65	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
T7	Yes	Yes	1	1	1	1	1	0.65	0.65	1
58.33-50.00				1	1	1	1	0.65	0.65	1
T8	Yes	Yes	1	1	1	1	1	0.65	0.65	1
50.00-37.50				1	1	1	1	0.65	0.65	1
T9	Yes	Yes	1	1	1	1	1	0.65	0.65	1
37.50-25.00				1	1	1	1	0.65	0.65	1
T10	Yes	Yes	1	1	1	1	1	0.65	0.65	1
25.00-0.00				1	1	1	1	0.65	0.65	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	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-150.00														
T2	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
150.00-125.00														
T3	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
125.00-100.00														
T4	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.00-75.00														
T5 75.00-66.67	0.0000	0.75	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 66.67-58.33	0.0000	0.75	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 58.33-50.00	0.0000	0.75	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 50.00-37.50	0.0000	0.75	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 37.50-25.00	0.0000	0.75	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 25.00-0.00	0.0000	0.75	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	Connection Offsets Diagonal Vert. Top in	Diagonal Horiz. Top in	Diagonal Vert. Bot. in	Diagonal Horiz. Bot. in	K-Bracing Vert. Top in	K-Bracing Horiz. Top in	K-Bracing Vert. Bot. in	K-Bracing Horiz. Bot. in
T1	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
160.00-150.00								
T2	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
150.00-125.00								
T3	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
125.00-100.00								

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T4 100.00-75.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 75.00-66.67	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 66.67-58.33	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 58.33-50.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T8 50.00-37.50	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T9 37.50-25.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T10 25.00-0.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

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 160.00-150.00	Flange	0.7500 A325X	6	0.7500 A325N	1	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T2 150.00-125.00	Flange	0.7500 A325X	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T3 125.00-100.00	Flange	0.7500 A325X	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T4 100.00-75.00	Flange	0.7500 A325X	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T5 75.00-66.67	Flange	0.8750 A325X	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T6 66.67-58.33	Flange	0.8750 A325X	6	0.7500 A325N	1	0.6250 A325X	2	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T7 58.33-50.00	Flange	0.8750 A325X	6	0.7500 A325N	1	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T8 50.00-37.50	Flange	1.0000 A325X	8	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T9 37.50-25.00	Flange	1.0000 A325X	8	1.0000 A325N	1	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0
T10 25.00-0.00	Flange	1.0000 A325X	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
AVA50-FX (NWCT)	B	No	Ar (CaAa)	140.00 - 0.00	-0.5000	-0.14	1	1	1.1020	1.1020		0.29
1 5/8" Hybriflex (VZW - FOC)	B	No	Ar (CaAa)	75.00 - 0.00	-1.0000	0	1	1	1.6250	1.6250		1.48
1 5/8	C	No	Ar (CaAa)	125.00 - 0.00	-3.0000	0	12	6	1.9800	1.9800		1.04

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(T-Mobile) 1 1/4 (ATT)	B	No	Ar (CaAa)	140.00 - 0.00	-4.0000	0.38	12	6	1.5500	1.5500		0.66
3" Flex Conduit w 1 Fiber & 2 DC (ATT)	B	No	Ar (CaAa)	140.00 - 0.00	-1.0000	0.43	1	1	3.0000	3.0000		3.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	159.00 - 0.00	-1.0000	-0.49	1	1	1.9800	1.9800		0.82
LDF2-50A (3/8 FOAM)	B	No	Ar (CaAa)	158.00 - 0.00	-1.0000	-0.47	4	4	0.4400	0.4400		0.08
LDF4-50A (1/2 FOAM)	B	No	Ar (CaAa)	158.00 - 0.00	-1.0000	-0.45	2	2	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	157.00 - 0.00	-1.0000	-0.42	2	2	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	157.00 - 0.00	-1.0000	-0.4	1	1	1.0900	1.0900		0.33
LDF2-50 (3/8 FOAM)	B	No	Ar (CaAa)	157.00 - 0.00	-1.0000	-0.38	2	2	0.4400	0.4400		0.08
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	155.00 - 0.00	-1.0000	-0.36	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	B	No	Ar (CaAa)	145.00 - 0.00	-1.0000	-0.32	1	1	1.5500	1.5500		0.66
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	141.33 - 0.00	-1.0000	-0.3	1	1	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	141.00 - 0.00	-1.0000	-0.28	2	2	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	139.50 - 0.00	-1.0000	-0.26	2	2	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	120.00 - 0.00	-1.0000	-0.24	1	1	1.0900	1.0900		0.33
EW63	B	No	Af (CaAa)	107.00 - 0.00	-1.0000	-0.2	2	2	1.5742	1.5742		0.51
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	82.00 - 0.00	-1.0000	-0.18	1	1	1.0900	1.0900		0.33
AVA7-50 (1-5/8 LOW DENSI. FOAM) (CSP)	B	No	Ar (CaAa)	160.00 - 0.00	-1.0000	-0.16	2	2	1.9800	1.9800		0.72
LDF4-50A (1/2 FOAM) (CSP)	B	No	Ar (CaAa)	160.00 - 0.00	-1.0000	-0.12	1	1	0.6300	0.6300		0.15
1-5/8 Fiber Optic Cable (ATT)	B	No	Ar (CaAa)	140.00 - 0.00	-1.0000	0.4	1	1	1.9800	1.9800		1.30
1/2 (ATT)	B	No	Ar (CaAa)	140.00 - 0.00	-1.0000	0.4	2	2	0.5800	0.5800		0.25
1 1/4" Hybriflex Cables (Sprint)	C	No	Ar (CaAa)	97.30 - 0.00	-0.5000	-0.09	4	4	1.2500	1.2500		1.13

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

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	160.00-150.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	13.484	0.000	44.80
		C	0.000	0.000	0.000	0.000	0.00
T2	150.00-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	98.660	0.000	409.01
		C	0.000	0.000	0.000	0.000	0.00
T3	125.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	140.472	0.000	595.24
		C	0.000	0.000	59.400	0.000	312.00
T4	100.00-75.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	151.116	0.000	617.56
		C	0.000	0.000	70.550	0.000	412.80
T5	75.00-66.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	52.353	0.000	220.14
		C	0.000	0.000	23.967	0.000	141.67
T6	66.67-58.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	52.339	0.000	220.14
		C	0.000	0.000	23.967	0.000	141.67
T7	58.33-50.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	52.327	0.000	220.14
		C	0.000	0.000	23.967	0.000	141.67
T8	50.00-37.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	78.472	0.000	330.21
		C	0.000	0.000	35.950	0.000	212.50
T9	37.50-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	78.468	0.000	330.21
		C	0.000	0.000	35.950	0.000	212.50
T10	25.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	157.038	0.000	660.43
		C	0.000	0.000	71.900	0.000	425.00

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
T1	160.00-150.00	A	2.326	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	69.238	0.000	973.95
		C		0.000	0.000	0.000	0.000	0.00
T2	150.00-125.00	A	2.328	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	377.244	0.000	6093.04
		C		0.000	0.000	0.000	0.000	0.00
T3	125.00-100.00	A	2.334	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	498.307	0.000	8350.28
		C		0.000	0.000	89.051	0.000	2588.29
T4	100.00-75.00	A	2.343	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	531.086	0.000	8872.18
		C		0.000	0.000	130.070	0.000	3278.60
T5	75.00-66.67	A	2.349	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	186.028	0.000	3134.66
		C		0.000	0.000	45.040	0.000	1122.35
T6	66.67-58.33	A	2.350	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	186.106	0.000	3137.31
		C		0.000	0.000	45.048	0.000	1122.87
T7	58.33-50.00	A	2.350	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	186.096	0.000	3136.97
		C		0.000	0.000	45.047	0.000	1122.81
T8	50.00-37.50	A	2.345	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
		B		0.000	0.000	278.793	0.000	4693.49
		C		0.000	0.000	67.532	0.000	1681.83
T9	37.50-25.00	A	2.326	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	277.413	0.000	4646.60
		C		0.000	0.000	67.377	0.000	1672.48
T10	25.00-0.00	A	2.217	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	538.887	0.000	8760.58
		C		0.000	0.000	132.973	0.000	3237.69

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	160.00-150.00	2.0742	-11.3500	1.8629	-10.5142
T2	150.00-125.00	13.4705	-13.4176	8.4593	-13.3985
T3	125.00-100.00	16.4424	-3.8532	11.0565	-9.5042
T4	100.00-75.00	17.5795	-3.9453	11.8079	-8.9009
T5	75.00-66.67	19.0261	-4.5039	13.3877	-10.1500
T6	66.67-58.33	19.5692	-4.6420	13.8131	-10.4660
T7	58.33-50.00	18.7454	-4.4549	13.5178	-10.2332
T8	50.00-37.50	21.3083	-5.0729	15.2086	-11.4919
T9	37.50-25.00	20.6000	-4.9046	15.0159	-11.2949
T10	25.00-0.00	22.0539	-5.2174	16.4071	-12.0710

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	7	LDF7-50A (1-5/8 FOAM)	150.00 - 159.00	0.6000	0.5992
T1	8	LDF2-50A (3/8 FOAM)	150.00 - 158.00	0.6000	0.5992
T1	9	LDF4-50A (1/2 FOAM)	150.00 - 158.00	0.6000	0.5992
T1	10	LDF7-50A (1-5/8 FOAM)	150.00 - 157.00	1.0000	1.0000
T1	11	LDF5-50A (7/8 FOAM)	150.00 - 157.00	0.6000	0.5992
T1	12	LDF2-50 (3/8 FOAM)	150.00 - 157.00	0.6000	0.5992
T1	13	LDF5-50A (7/8 FOAM)	150.00 - 155.00	0.6000	0.5992
T1	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	150.00 - 160.00	1.0000	1.0000
T1	22	LDF4-50A (1/2 FOAM)	150.00 - 160.00	0.6000	0.5992
T2	1	AVA50-FX	125.00 - 140.00	0.6000	0.6000
T2	5	1 1/4	125.00 - 140.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	6	3" Flex Conduit w 1 Fiber & 2 DC	125.00 - 140.00	1.0000	0.6000
T2	7	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	8	LDF2-50A (3/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	9	LDF4-50A (1/2 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	10	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	1.0000	1.0000
T2	11	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	12	LDF2-50 (3/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	13	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	14	LDF6-50A (1-1/4 FOAM)	125.00 - 145.00	0.6000	0.6000
T2	15	LDF7-50A (1-5/8 FOAM)	125.00 - 141.33	1.0000	1.0000
T2	16	LDF7-50A (1-5/8 FOAM)	125.00 - 141.00	0.6000	0.6000
T2	17	LDF7-50A (1-5/8 FOAM)	125.00 - 139.50	0.6000	0.6000
T2	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	125.00 - 150.00	1.0000	1.0000
T2	22	LDF4-50A (1/2 FOAM)	125.00 - 150.00	0.6000	0.6000
T2	23	1-5/8 Fiber Optic Cable	125.00 - 140.00	0.6000	0.6000
T2	24	1/2	125.00 - 140.00	0.6000	0.6000
T3	1	AVA50-FX	100.00 - 125.00	0.6000	0.6000
T3	4	1 5/8	100.00 - 125.00	0.6000	0.6000
T3	5	1 1/4	100.00 - 125.00	0.6000	0.6000
T3	6	3" Flex Conduit w 1 Fiber & 2 DC	100.00 - 125.00	1.0000	0.6000
T3	7	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	8	LDF2-50A (3/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	9	LDF4-50A (1/2 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	10	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	1.0000	1.0000
T3	11	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	12	LDF2-50 (3/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	13	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	14	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	15	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	1.0000	1.0000
T3	16	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	17	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	18	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T3	19	EW63	100.00 - 107.00	0.6000	0.6000
T3	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 125.00	1.0000	1.0000
T3	22	LDF4-50A (1/2 FOAM)	100.00 - 125.00	0.6000	0.6000
T3	23	1-5/8 Fiber Optic Cable	100.00 - 125.00	0.6000	0.6000
T3	24	1/2	100.00 - 125.00	0.6000	0.6000
T4	1	AVA50-FX	75.00 - 100.00	0.6000	0.6000
T4	4	1 5/8	75.00 - 100.00	0.6000	0.6000
T4	5	1 1/4	75.00 - 100.00	0.6000	0.6000
T4	6	3" Flex Conduit w 1 Fiber & 2 DC	75.00 - 100.00	1.0000	0.6000
T4	7	LDF7-50A (1-5/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	8	LDF2-50A (3/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	9	LDF4-50A (1/2 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	10	LDF7-50A (1-5/8 FOAM)	75.00 - 100.00	1.0000	1.0000
T4	11	LDF5-50A (7/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	12	LDF2-50 (3/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	13	LDF5-50A (7/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	14	LDF6-50A (1-1/4 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	15	LDF7-50A (1-5/8 FOAM)	75.00 - 100.00	1.0000	1.0000
T4	16	LDF7-50A (1-5/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	17	LDF7-50A (1-5/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	18	LDF5-50A (7/8 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	19	EW63	75.00 - 100.00	0.6000	0.6000
T4	20	LDF5-50A (7/8 FOAM)	75.00 - 82.00	0.6000	0.6000
T4	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	75.00 - 100.00	1.0000	1.0000
T4	22	LDF4-50A (1/2 FOAM)	75.00 - 100.00	0.6000	0.6000
T4	23	1-5/8 Fiber Optic Cable	75.00 - 100.00	0.6000	0.6000
T4	24	1/2	75.00 - 100.00	0.6000	0.6000
T4	25	1 1/4" Hybriflex Cables	75.00 - 97.30	0.6000	0.6000
T5	1	AVA50-FX	66.67 - 75.00	0.6000	0.6000
T5	2	1 5/8" Hybriflex	66.67 - 75.00	0.6000	0.6000
T5	4	1 5/8	66.67 - 75.00	0.6000	0.6000
T5	5	1 1/4	66.67 - 75.00	0.6000	0.6000
T5	6	3" Flex Conduit w 1 Fiber & 2 DC	66.67 - 75.00	1.0000	0.6000
T5	7	LDF7-50A (1-5/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	8	LDF2-50A (3/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	9	LDF4-50A (1/2 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	10	LDF7-50A (1-5/8 FOAM)	66.67 - 75.00	1.0000	1.0000
T5	11	LDF5-50A (7/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	12	LDF2-50 (3/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	13	LDF5-50A (7/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	14	LDF6-50A (1-1/4 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	15	LDF7-50A (1-5/8 FOAM)	66.67 - 75.00	1.0000	1.0000
T5	16	LDF7-50A (1-5/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	17	LDF7-50A (1-5/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	18	LDF5-50A (7/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	19	EW63	66.67 - 75.00	0.6000	0.6000
T5	20	LDF5-50A (7/8 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	66.67 - 75.00	1.0000	1.0000
T5	22	LDF4-50A (1/2 FOAM)	66.67 - 75.00	0.6000	0.6000
T5	23	1-5/8 Fiber Optic Cable	66.67 - 75.00	0.6000	0.6000
T5	24	1/2	66.67 - 75.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	25	1 1/4" Hybriflex Cables	66.67 - 75.00	0.6000	0.6000
T6	1	AVA50-FX	58.33 - 66.67	0.6000	0.6000
T6	2	1 5/8" Hybriflex	58.33 - 66.67	0.6000	0.6000
T6	4	1 5/8	58.33 - 66.67	0.6000	0.6000
T6	5	1 1/4	58.33 - 66.67	0.6000	0.6000
T6	6	3" Flex Conduit w 1 Fiber & 2 DC	58.33 - 66.67	1.0000	0.6000
T6	7	LDF7-50A (1-5/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	8	LDF2-50A (3/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	9	LDF4-50A (1/2 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	10	LDF7-50A (1-5/8 FOAM)	58.33 - 66.67	1.0000	1.0000
T6	11	LDF5-50A (7/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	12	LDF2-50 (3/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	13	LDF5-50A (7/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	14	LDF6-50A (1-1/4 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	15	LDF7-50A (1-5/8 FOAM)	58.33 - 66.67	1.0000	1.0000
T6	16	LDF7-50A (1-5/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	17	LDF7-50A (1-5/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	18	LDF5-50A (7/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	19	EW63	58.33 - 66.67	0.6000	0.6000
T6	20	LDF5-50A (7/8 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	58.33 - 66.67	1.0000	1.0000
T6	22	LDF4-50A (1/2 FOAM)	58.33 - 66.67	0.6000	0.6000
T6	23	1-5/8 Fiber Optic Cable	58.33 - 66.67	0.6000	0.6000
T6	24	1/2	58.33 - 66.67	0.6000	0.6000
T6	25	1 1/4" Hybriflex Cables	58.33 - 66.67	0.6000	0.6000
T7	1	AVA50-FX	50.00 - 58.33	0.6000	0.6000
T7	2	1 5/8" Hybriflex	50.00 - 58.33	0.6000	0.6000
T7	4	1 5/8	50.00 - 58.33	0.6000	0.6000
T7	5	1 1/4	50.00 - 58.33	0.6000	0.6000
T7	6	3" Flex Conduit w 1 Fiber & 2 DC	50.00 - 58.33	1.0000	0.6000
T7	7	LDF7-50A (1-5/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	8	LDF2-50A (3/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	9	LDF4-50A (1/2 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	10	LDF7-50A (1-5/8 FOAM)	50.00 - 58.33	1.0000	1.0000
T7	11	LDF5-50A (7/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	12	LDF2-50 (3/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	13	LDF5-50A (7/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	14	LDF6-50A (1-1/4 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	15	LDF7-50A (1-5/8 FOAM)	50.00 - 58.33	1.0000	1.0000
T7	16	LDF7-50A (1-5/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	17	LDF7-50A (1-5/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	18	LDF5-50A (7/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	19	EW63	50.00 - 58.33	0.6000	0.6000
T7	20	LDF5-50A (7/8 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	50.00 - 58.33	1.0000	1.0000
T7	22	LDF4-50A (1/2 FOAM)	50.00 - 58.33	0.6000	0.6000
T7	23	1-5/8 Fiber Optic Cable	50.00 - 58.33	0.6000	0.6000
T7	24	1/2	50.00 - 58.33	0.6000	0.6000
T7	25	1 1/4" Hybriflex Cables	50.00 - 58.33	0.6000	0.6000
T8	1	AVA50-FX	37.50 - 50.00	0.6000	0.6000
T8	2	1 5/8" Hybriflex	37.50 - 50.00	0.6000	0.6000
T8	4	1 5/8	37.50 - 50.00	0.6000	0.6000
T8	5	1 1/4	37.50 - 50.00	0.6000	0.6000
T8	6	3" Flex Conduit w 1 Fiber & 2 DC	37.50 - 50.00	1.0000	0.6000
T8	7	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	8	LDF2-50A (3/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	9	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	10	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	1.0000	1.0000
T8	11	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	12	LDF2-50 (3/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	13	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	14	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	15	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	1.0000	1.0000
T8	16	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	17	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	18	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	19	EW63	37.50 - 50.00	0.6000	0.6000
T8	20	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	37.50 - 50.00	1.0000	1.0000
T8	22	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000
T8	23	1-5/8 Fiber Optic Cable	37.50 - 50.00	0.6000	0.6000
T8	24	1/2	37.50 - 50.00	0.6000	0.6000
T8	25	1 1/4" Hybriflex Cables	37.50 - 50.00	0.6000	0.6000
T9	1	AVA50-FX	25.00 - 37.50	0.6000	0.6000
T9	2	1 5/8" Hybriflex	25.00 - 37.50	0.6000	0.6000
T9	4	1 5/8	25.00 - 37.50	0.6000	0.6000
T9	5	1 1/4	25.00 - 37.50	0.6000	0.6000
T9	6	3" Flex Conduit w 1 Fiber & 2 DC	25.00 - 37.50	1.0000	0.6000
T9	7	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	8	LDF2-50A (3/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	9	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	10	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	1.0000	1.0000
T9	11	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	12	LDF2-50 (3/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	13	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	14	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	15	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	1.0000	1.0000
T9	16	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	17	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	18	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	19	EW63	25.00 - 37.50	0.6000	0.6000
T9	20	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	25.00 - 37.50	1.0000	1.0000
T9	22	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T9	23	1-5/8 Fiber Optic Cable	25.00 - 37.50	0.6000	0.6000
T9	24	1/2	25.00 - 37.50	0.6000	0.6000
T9	25	1 1/4" Hybriflex Cables	25.00 - 37.50	0.6000	0.6000
T10	1	AVA50-FX	0.00 - 25.00	0.6000	0.6000
T10	2	1 5/8" Hybriflex	0.00 - 25.00	0.6000	0.6000
T10	4	1 5/8	0.00 - 25.00	0.6000	0.6000
T10	5	1 1/4	0.00 - 25.00	0.6000	0.6000
T10	6	3" Flex Conduit w 1 Fiber & 2 DC	0.00 - 25.00	1.0000	0.6000
T10	7	LDF7-50A (1-5/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	8	LDF2-50A (3/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	9	LDF4-50A (1/2 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	10	LDF7-50A (1-5/8 FOAM)	0.00 - 25.00	1.0000	1.0000
T10	11	LDF5-50A (7/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	12	LDF2-50 (3/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	13	LDF5-50A (7/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	14	LDF6-50A (1-1/4 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	15	LDF7-50A (1-5/8 FOAM)	0.00 - 25.00	1.0000	1.0000
T10	16	LDF7-50A (1-5/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	17	LDF7-50A (1-5/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	18	LDF5-50A (7/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	19	EW63	0.00 - 25.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	20	LDF5-50A (7/8 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	21	AVA7-50 (1-5/8 LOW DENSI. FOAM)	0.00 - 25.00	1.0000	1.0000
T10	22	LDF4-50A (1/2 FOAM)	0.00 - 25.00	0.6000	0.6000
T10	23	1-5/8 Fiber Optic Cable	0.00 - 25.00	0.6000	0.6000
T10	24	1/2	0.00 - 25.00	0.6000	0.6000
T10	25	1 1/4" Hybriflex Cables	0.00 - 25.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
*** Inventory from D&K Climb (3/272016)									
*** Existing Carrier VZW									
SBNHH-1D65B	A	From Leg	2.00	0.0000	75.00	No Ice	8.20	5.42	40.60
(VZW-700&AWS)			-3.00			1/2" Ice	8.66	5.88	91.24
			0.00			1" Ice	9.13	6.35	148.02
SBNHH-1D65B	A	From Leg	2.00	0.0000	75.00	No Ice	8.20	5.42	40.60
(VZW-850&PCS)			3.00			1/2" Ice	8.66	5.88	91.24
			0.00			1" Ice	9.13	6.35	148.02
SBNHH-1D65B	B	From Leg	2.00	0.0000	75.00	No Ice	8.20	5.42	40.60
(VZW-700&AWS)			-3.00			1/2" Ice	8.66	5.88	91.24
			0.00			1" Ice	9.13	6.35	148.02
SBNHH-1D65B	B	From Leg	2.00	0.0000	75.00	No Ice	8.20	5.42	40.60
(VZW-850&PCS)			3.00			1/2" Ice	8.66	5.88	91.24
			0.00			1" Ice	9.13	6.35	148.02
5' T-arm	A	None		0.0000	75.00	No Ice	4.50	2.50	250.00
(VZW)						1/2" Ice	5.50	3.20	315.00
						1" Ice	6.50	3.90	380.00
5' T-arm	A	None		0.0000	75.00	No Ice	4.50	2.50	250.00
(VZW)						1/2" Ice	5.50	3.20	315.00
						1" Ice	6.50	3.90	380.00
RH_2x60-07-L (700 MHz)	A	From Leg	2.00	0.0000	75.00	No Ice	1.82	1.52	60.00
(VZW)			-3.00			1/2" Ice	1.99	1.69	77.37
			0.00			1" Ice	2.18	1.86	97.53
RH_2x60-07-L (700 MHz)	B	From Leg	2.00	0.0000	75.00	No Ice	1.82	1.52	60.00
(VZW)			-3.00			1/2" Ice	1.99	1.69	77.37
			0.00			1" Ice	2.18	1.86	97.53
DC6-48-60-18-8F	C	None		0.0000	75.00	No Ice	1.27	1.27	20.00
(VZW)						1/2" Ice	1.46	1.46	35.12
						1" Ice	1.66	1.66	52.57
RRH_2x60-AWS	A	From Leg	2.00	0.0000	75.00	No Ice	1.87	1.23	44.00
(VZW)			3.00			1/2" Ice	2.04	1.38	59.92
			0.00			1" Ice	2.23	1.53	78.53
RRH_2x60-AWS	B	From Leg	2.00	0.0000	75.00	No Ice	1.87	1.23	44.00
(VZW)			3.00			1/2" Ice	2.04	1.38	59.92
			0.00			1" Ice	2.23	1.53	78.53
*** Existing Carrier - T-Mobile @ 119' Climbed by									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
D&K									
RR90-17-02DP	A	From Leg	2.50	0.0000	119.00	No Ice	4.36	1.97	18.00
(T-Mobile DNK 8-10)			1.50			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
RR90-17-02DP	B	From Leg	2.50	0.0000	119.00	No Ice	4.36	1.97	18.00
(T-Mobile DNK 8-10)			1.50			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
RR90-17-02DP	C	From Leg	2.50	0.0000	119.00	No Ice	4.36	1.97	18.00
(T-Mobile DNK 8-10)			1.50			1/2" Ice	4.70	2.31	40.42
			0.00			1" Ice	5.06	2.66	67.36
DSM2	A	From Leg	0.50	0.0000	119.00	No Ice	2.03	1.56	90.00
(T-Mobile DNK 8-10)			0.00			1/2" Ice	2.30	1.78	134.51
			0.00			1" Ice	2.58	2.01	183.60
DSM2	B	From Leg	0.50	0.0000	119.00	No Ice	2.03	1.56	90.00
(T-Mobile DNK 8-10)			0.00			1/2" Ice	2.30	1.78	134.51
			0.00			1" Ice	2.58	2.01	183.60
DSM2	C	From Leg	0.50	0.0000	119.00	No Ice	2.03	1.56	90.00
(T-Mobile DNK 8-10)			0.00			1/2" Ice	2.30	1.78	134.51
			0.00			1" Ice	2.58	2.01	183.60
LNX-6515DS-VTM w/ 6' 2"	A	From Leg	2.00	0.0000	119.00	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			-1.50			1/2" Ice	12.06	10.21	153.66
(T-Mobile DNK 8-10)			0.00			1" Ice	12.69	11.18	244.76
LNX-6515DS-VTM w/ 6' 2"	B	From Leg	2.00	0.0000	119.00	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			-1.50			1/2" Ice	12.06	10.21	153.66
(T-Mobile DNK 8-10)			0.00			1" Ice	12.69	11.18	244.76
LNX-6515DS-VTM w/ 6' 2"	C	From Leg	2.00	0.0000	119.00	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			-1.50			1/2" Ice	12.06	10.21	153.66
(T-Mobile DNK 8-10)			0.00			1" Ice	12.69	11.18	244.76
*** Existing Carrier - AT&T @ 135' Climbed by D&K									
*** D&K Climbed Inventory - Remaining Antennas									
16x16 Panel 19dBi 2.45GHz	B	From Leg	1.00	0.0000	82.00	No Ice	2.34	2.34	10.00
ISM			0.00			1/2" Ice	2.65	2.65	20.00
(DNK-1)			0.00			1" Ice	2.96	2.96	30.00
1' Side Mount Standoff	B	None		0.0000	82.00	No Ice	2.64	2.64	40.00
(DNK-1)						1/2" Ice	3.69	3.69	50.00
						1" Ice	4.74	4.74	60.00
4"x96"x72" Ice Canopy	A	From Leg	3.00	0.0000	107.50	No Ice	3.73	2.80	300.00
(DNK-5)			0.00			1/2" Ice	4.39	3.30	551.38
			0.00			1" Ice	5.05	3.80	814.11
4"x96"x72" Ice Canopy	C	From Leg	3.00	0.0000	107.50	No Ice	3.73	2.80	300.00
(DNK-6)			0.00			1/2" Ice	4.39	3.30	551.38
			0.00			1" Ice	5.05	3.80	814.11
8' Stiff-Arm	B	From Leg	0.00	45.0000	108.00	No Ice	5.00	5.00	250.00
(DNK-7)			0.00			1/2" Ice	10.00	10.00	300.00
			0.00			1" Ice	15.00	15.00	350.00
8' Stiff-Arm	C	From Leg	0.00	-45.0000	108.00	No Ice	5.00	5.00	250.00
(DNK-7)			0.00			1/2" Ice	10.00	10.00	300.00
			0.00			1" Ice	15.00	15.00	350.00
PD1142-1	C	From Face	5.00	0.0000	120.00	No Ice	1.32	1.32	10.00
(DNK-11)			0.00			1/2" Ice	3.21	3.21	23.85
			0.00			1" Ice	5.12	5.12	49.42
*** Mount shared with DNK-7									
SC479-HF1LDF	C	From Face	2.50	0.0000	141.00	No Ice	4.31	4.31	34.00
(DNK-18)			0.00			1/2" Ice	6.54	6.54	69.82

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
			0.00			1" Ice	8.04	8.04	114.98
8' Stiff-Arm	B	From Leg	0.00	45.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-18 (4 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 18, 24, 25, Sinclair))			0.00			1" Ice	15.00	15.00	350.00
8' Stiff-Arm	C	From Leg	0.00	-45.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-18 (4 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 18, 24, 25, Sinclair))			0.00			1" Ice	15.00	15.00	350.00
SC479-HF1LDF	C	From Leg	1.00	0.0000	139.50	No Ice	4.31	4.31	34.00
(DNK-19)			5.00			1/2" Ice	6.54	6.54	69.82
			0.00			1" Ice	8.04	8.04	114.98
10' PCS Frame (1)	C	None		0.0000	139.50	No Ice	9.00	9.00	250.00
(DNK-19 (3 antennas						1/2" Ice	13.20	13.20	350.00
Attached - 19,20,26))						1" Ice	17.40	17.40	450.00
SC479-HF1LDF	C	From Leg	1.00	0.0000	139.50	No Ice	4.31	4.31	34.00
(DNK-20)			-5.00			1/2" Ice	6.54	6.54	69.82
			0.00			1" Ice	8.04	8.04	114.98
SC479-HF1LDF	A	From Face	0.00	0.0000	141.25	No Ice	4.31	4.31	34.00
(DNK-21)			0.00			1/2" Ice	6.54	6.54	69.82
			0.00			1" Ice	8.04	8.04	114.98
8' Stiff-Arm	A	From Face	0.00	-30.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-21 (2 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 21,29))			0.00			1" Ice	15.00	15.00	350.00
8' Stiff-Arm	C	From Leg	0.00	0.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-21 (2 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 21,29))			0.00			1" Ice	15.00	15.00	350.00
8' Stiff-Arm	A	From Leg	0.00	0.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-22 (5 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 22,27,31,32,33))			0.00			1" Ice	15.00	15.00	350.00
8' Stiff-Arm	C	From Face	0.00	30.0000	141.00	No Ice	5.00	5.00	250.00
(DNK-22 (5 antennas			0.00			1/2" Ice	10.00	10.00	300.00
Attached - 22,27,31,32,33))			0.00			1" Ice	15.00	15.00	350.00
DC6-48-60-18-8F (Squid)	B	From Leg	1.00	0.0000	145.00	No Ice	0.79	0.79	20.00
Suppressor			0.00			1/2" Ice	1.27	1.27	35.12
(DNK-23)			0.00			1" Ice	1.45	1.45	52.57
*** Appears to be leg mounted from Climb Photos *** Mount Shared with DNK-18									
TMA 432-83H-01T	B	From Leg	1.25	0.0000	158.00	No Ice	1.40	0.82	25.00
(DNK-25)			0.00			1/2" Ice	1.55	0.94	37.44
			0.00			1" Ice	1.70	1.06	52.22
*** Mount Shared with DNK-18									
SC479-HF1LDF	C	From Leg	1.00	0.0000	157.00	No Ice	4.33	4.33	34.00
(DNK-26)			5.00			1/2" Ice	6.54	6.54	69.82
			0.00			1" Ice	8.04	8.04	114.98
*** Mount Shared with DNK-19									
DB304-A	C	From Leg	0.50	0.0000	155.00	No Ice	4.85	4.85	45.00
(DNK-27)			0.00			1/2" Ice	8.73	8.73	58.50
			0.00			1" Ice	12.61	12.61	72.00
*** Mount Shared with DNK-22									
DB228-A	C	From Leg	0.50	0.0000	157.00	No Ice	7.30	7.30	72.00
(DNK-28)			0.00			1/2" Ice	13.14	13.14	93.60

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1" Ice	18.98	18.98	115.20
*** Mount Shared with DNK-30										
SC479-HF1LDF	A	From Face	2.50		0.0000	159.00	No Ice	4.33	4.33	34.00
(DNK-29)			0.00				1/2" Ice	6.54	6.54	69.82
			0.00				1" Ice	8.04	8.04	114.98
*** Mount Shared with DNK-21										
TMA 432-83H-01T	A	From Face	0.00		0.0000	158.00	No Ice	1.40	0.82	25.00
(DNK-30)			0.00				1/2" Ice	1.55	0.94	37.44
			0.00				1" Ice	1.70	1.06	52.22
*** Mount Shared with DNK-22										
SC479-HF1LDF(D00I-E6085)	A	From Leg	2.50		0.0000	157.50	No Ice	5.06	5.06	30.00
(DNK-32 - Troop L RX (PNS-Proposed 01272017))			0.00				1/2" Ice	6.54	6.54	69.82
			0.00				1" Ice	8.04	8.04	114.98
*** Mount Shared with DNK-22										
Lightning Rod 2"x21'	A	None			0.0000	160.00	No Ice	4.20	4.20	80.00
(DNK-33)							1/2" Ice	6.33	6.33	112.30
							1" Ice	8.47	8.47	157.78
*** PNS-621 Proposal Mount/Ant										
(PSA6) 6' Side-Arm	A	From Leg	0.00		45.0000	160.00	No Ice	10.60	10.60	140.00
(CSP)			0.00				1/2" Ice	15.40	15.40	212.00
			0.00				1" Ice	20.20	20.20	284.00
SC479-HF1LDF(D00-E6085)	A	From Leg	0.00		45.0000	160.00	No Ice	5.06	5.06	30.00
(CSP)			6.00				1/2" Ice	6.54	6.54	69.82
			0.00				1" Ice	8.04	8.04	114.98
432E-83I-01T TTA Unit	A	None			0.0000	158.00	No Ice	2.85	0.97	25.00
(CSP)							1/2" Ice	3.06	1.11	44.70
							1" Ice	3.28	1.26	67.39
SC479-HF1LDF(D00I-E6085) (Inverted)	A	From Leg	0.00		45.0000	145.00 - 160.00	No Ice	4.33	4.33	34.00
(CSP)			6.00				1/2" Ice	6.54	6.54	69.82
			0.00				1" Ice	8.04	8.04	114.98
*** AIROSmith Antennas - Sprint (1/12/2018)										
APXVSPP18-C-A20	A	From Face	0.50		0.0000	97.00	No Ice	8.26	6.71	90.00
(Sprint DNK 2-4)			0.00				1/2" Ice	8.81	7.66	149.38
			0.00				1" Ice	9.36	8.49	223.56
APXVSPP18-C-A20	B	From Face	0.50		0.0000	97.00	No Ice	8.26	6.71	90.00
(Sprint DNK 2-4)			0.00				1/2" Ice	8.81	7.66	149.38
			0.00				1" Ice	9.36	8.49	223.56
APXVSPP18-C-A20	C	From Leg	0.50		0.0000	97.00	No Ice	8.26	6.71	90.00
(Sprint DNK 2-4)			0.00				1/2" Ice	8.81	7.66	149.38
			0.00				1" Ice	9.36	8.49	223.56
DT465B-2XR-V2 Panels	A	From Leg	1.50		0.0000	97.00	No Ice	9.10	5.97	58.00
(Commscope)			0.00				1/2" Ice	9.56	6.43	116.00
(Sprint)			0.00				1" Ice	10.04	6.90	180.29
DT465B-2XR-V2 Panels	B	From Leg	1.50		0.0000	97.00	No Ice	9.10	5.97	58.00
(Commscope)			0.00				1/2" Ice	9.56	6.43	116.00
(Sprint)			0.00				1" Ice	10.04	6.90	180.29
DT465B-2XR-V2 Panels	C	From Leg	1.50		0.0000	97.00	No Ice	9.10	5.97	58.00
(Commscope)			0.00				1/2" Ice	9.56	6.43	116.00
(Sprint)			0.00				1" Ice	10.04	6.90	180.29
RRH 800MHz 2x50W	A	From Face	1.00		0.0000	97.00	No Ice	2.49	2.34	70.00

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
(Sprint)			1.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
RRH 800MHz 2x50W	B	From Face	1.00	0.0000	97.00	No Ice	2.49	2.34	70.00
(Sprint)			1.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
RRH 800MHz 2x50W	C	From Face	1.00	0.0000	97.00	No Ice	2.49	2.34	70.00
(Sprint)			-5.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
RRH 800MHz 2x50W	A	From Face	1.00	0.0000	97.00	No Ice	2.49	2.34	70.00
(Sprint DNK 2-4)			1.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
RRH 800MHz 2x50W	B	From Face	1.00	0.0000	97.00	No Ice	2.49	2.34	70.00
(Sprint DNK 2-4)			1.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
RRH 800MHz 2x50W	C	From Face	1.00	0.0000	97.00	No Ice	2.49	2.34	70.00
(Sprint DNK 2-4)			-5.00			1/2" Ice	2.71	2.66	95.17
			0.00			1" Ice	2.94	3.02	125.05
TD-RRH8x20	A	From Face	0.50	0.0000	97.00	No Ice	4.72	1.70	66.13
(Sprint)			0.00			1/2" Ice	5.01	1.92	93.27
			0.00			1" Ice	5.32	2.14	123.93
TD-RRH8x20	B	From Face	0.50	0.0000	97.00	No Ice	4.72	1.70	66.13
(Sprint)			0.00			1/2" Ice	5.01	1.92	93.27
			0.00			1" Ice	5.32	2.14	123.93
TD-RRH8x20	C	From Face	0.50	0.0000	97.00	No Ice	4.72	1.70	66.13
(Sprint)			-5.00			1/2" Ice	5.01	1.92	93.27
			0.00			1" Ice	5.32	2.14	123.93
RRH 1900 MHz 2x40W	A	From Face	0.50	0.0000	97.00	No Ice	2.49	3.34	100.00
(Sprint DNK 2-4)			0.00			1/2" Ice	2.71	3.69	126.85
			0.00			1" Ice	2.94	4.08	162.74
RRH 1900 MHz 2x40W	B	From Face	0.50	0.0000	97.00	No Ice	2.49	3.34	100.00
(Sprint DNK 2-4)			0.00			1/2" Ice	2.71	3.69	126.85
			0.00			1" Ice	2.94	4.08	162.74
RRH 1900 MHz 2x40W	C	From Face	0.50	0.0000	97.00	No Ice	2.49	3.34	100.00
(Sprint DNK 2-4)			-5.00			1/2" Ice	2.71	3.69	126.85
			0.00			1" Ice	2.94	4.08	162.74
PM-SU35-48 - Pipe Mount	A	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint DNK 2-4)			0.00			1" Ice	5.73	5.73	205.59
PM-SU35-48 - Pipe Mount	B	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint DNK 2-4)			0.00			1" Ice	5.73	5.73	205.59
PM-SU35-48 - Pipe Mount	C	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint DNK 2-4)			0.00			1" Ice	5.73	5.73	205.59
*** AIROSmith Antennas - Sprint (1/12/2018)									
*** Empire Antennas - 1/16/2018									
T-Frame	A	From Leg	2.00	0.0000	140.00	No Ice	8.90	8.90	224.00
(ATT DNK 12-17)			0.00			1/2" Ice	13.80	13.80	317.00
			0.00			1" Ice	18.80	18.80	410.00
T-Frame	B	From Leg	2.00	0.0000	140.00	No Ice	8.90	8.90	224.00
(ATT DNK 12-17)			0.00			1/2" Ice	13.80	13.80	317.00
			0.00			1" Ice	18.80	18.80	410.00
T-Frame	C	From Leg	2.00	0.0000	140.00	No Ice	8.90	8.90	224.00
(ATT DNK 12-17)			0.00			1/2" Ice	13.80	13.80	317.00
			0.00			1" Ice	18.80	18.80	410.00

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
7770.00	A	From Leg	1.50	0.0000	140.00	No Ice	5.53	4.01	52.03
(ATT DNK 12-17)			-5.00			1/2" Ice	5.89	4.64	97.08
			0.00			1" Ice	6.26	5.28	148.33
7770.00	B	From Leg	1.50	0.0000	140.00	No Ice	5.53	4.01	52.03
(ATT DNK 12-17)			-5.00			1/2" Ice	5.89	4.64	97.08
			0.00			1" Ice	6.26	5.28	148.33
7770.00	C	From Leg	1.50	0.0000	140.00	No Ice	5.53	4.01	52.03
(ATT DNK 12-17)			-5.00			1/2" Ice	5.89	4.64	97.08
			0.00			1" Ice	6.26	5.28	148.33
SBNH-1D6565C	A	From Leg	1.50	0.0000	140.00	No Ice	11.48	9.64	81.81
(ATT DNK 12-17)			0.00			1/2" Ice	12.11	11.07	169.21
			0.00			1" Ice	12.75	12.39	266.40
SBNH-1D6565C	B	From Leg	1.50	0.0000	140.00	No Ice	11.48	9.64	81.81
(ATT DNK 12-17)			0.00			1/2" Ice	12.11	11.07	169.21
			0.00			1" Ice	12.75	12.39	266.40
AM-X-CD-16-65-00T-RET	B	From Leg	1.50	0.0000	140.00	No Ice	8.26	4.64	50.00
(6')			0.00			1/2" Ice	8.81	5.09	95.50
(ATT DNK 12-17)			0.00			1" Ice	9.36	5.54	148.00
Surge Suppressor	B	From Face	0.50	0.0000	140.00	No Ice	0.80	0.80	30.00
(ATT DNK 12-17)			5.00			1/2" Ice	0.94	0.94	41.94
			0.00			1" Ice	1.09	1.09	55.86
TPA-65R-LCUUUU-H8	A	From Leg	1.50	0.0000	140.00	No Ice	12.86	10.38	104.20
Panel w/ RET			-5.00			1/2" Ice	13.46	11.79	202.42
(ATT)			0.00			1" Ice	14.08	13.05	310.44
TPA-65R-LCUUUU-H8	B	From Leg	1.50	0.0000	140.00	No Ice	12.86	10.38	104.20
Panel w/ RET			-5.00			1/2" Ice	13.46	11.79	202.42
(ATT)			0.00			1" Ice	14.08	13.05	310.44
QS66512-3 Quintel Panel	C	From Leg	1.50	0.0000	140.00	No Ice	8.13	8.22	126.90
(ATT)			-5.00			1/2" Ice	8.59	9.19	199.99
			0.00			1" Ice	9.05	10.02	281.01
RRUS-32	A	From Leg	1.50	0.0000	140.00	No Ice	3.33	2.36	80.00
(ATT)			-5.00			1/2" Ice	3.55	2.56	112.20
			0.00			1" Ice	3.78	2.76	148.06
RRUS-12	A	From Leg	1.50	0.0000	140.00	No Ice	3.15	1.29	58.00
(ATT)			-5.00			1/2" Ice	3.36	1.44	81.22
			0.00			1" Ice	3.59	1.60	107.64
RRUS-11	A	From Leg	1.50	0.0000	140.00	No Ice	2.57	1.07	50.00
(ATT DNK 12-17)			-5.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
A2 Module Unit	A	From Leg	1.50	0.0000	140.00	No Ice	2.08	0.50	22.00
(ATT)			-5.00			1/2" Ice	2.26	0.61	34.73
			0.00			1" Ice	2.44	0.73	49.92
RRUS-32	B	From Leg	1.50	0.0000	140.00	No Ice	3.33	2.36	80.00
(ATT)			-5.00			1/2" Ice	3.55	2.56	112.20
			0.00			1" Ice	3.78	2.76	148.06
RRUS-12	B	From Leg	1.50	0.0000	140.00	No Ice	3.15	1.29	58.00
(ATT)			-5.00			1/2" Ice	3.36	1.44	81.22
			0.00			1" Ice	3.59	1.60	107.64
RRUS-11	B	From Leg	1.50	0.0000	140.00	No Ice	2.57	1.07	50.00
(ATT DNK 12-17)			-5.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
A2 Module Unit	B	From Leg	1.50	0.0000	140.00	No Ice	2.08	0.50	22.00
(ATT)			-5.00			1/2" Ice	2.26	0.61	34.73
			0.00			1" Ice	2.44	0.73	49.92
RRUS-32	C	From Leg	1.50	0.0000	140.00	No Ice	3.33	2.36	80.00
(ATT)			-5.00			1/2" Ice	3.55	2.56	112.20
			0.00			1" Ice	3.78	2.76	148.06

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
RRUS-12	C	From Leg	1.50	0.0000	140.00	No Ice	3.15	1.29	58.00
(ATT)			-5.00			1/2" Ice	3.36	1.44	81.22
			0.00			1" Ice	3.59	1.60	107.64
RRUS-11	C	From Leg	1.50	0.0000	140.00	No Ice	2.57	1.07	50.00
(ATT DNK 12-17)			-5.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
A2 Module Unit	C	From Leg	1.50	0.0000	140.00	No Ice	2.08	0.50	22.00
(ATT)			-5.00			1/2" Ice	2.26	0.61	34.73
			0.00			1" Ice	2.44	0.73	49.92
DC6-48-60-18-8F (Squid)	A	From Leg	0.50	0.0000	140.00	No Ice	0.79	0.79	20.00
Suppressor			0.00			1/2" Ice	1.27	1.27	35.12
(ATT)			0.00			1" Ice	1.45	1.45	52.57
TT19-08BP111-001 TMA's	A	From Leg	1.50	0.0000	140.00	No Ice	0.55	0.45	16.00
(ATT DNK 12-17)			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
TT19-08BP111-001 TMA's	B	From Leg	1.50	0.0000	140.00	No Ice	0.55	0.45	16.00
(ATT DNK 12-17)			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
TT19-08BP111-001 TMA's	C	From Leg	1.50	0.0000	140.00	No Ice	0.55	0.45	16.00
(ATT DNK 12-17)			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
(2) LGP21401 Diplexer	A	From Leg	1.50	0.0000	140.00	No Ice	1.10	0.21	14.10
(ATT DNK 12-17)			0.00			1/2" Ice	1.24	0.27	21.26
			0.00			1" Ice	1.38	0.35	30.32
(2) LGP21401 Diplexer	B	From Leg	1.50	0.0000	140.00	No Ice	1.10	0.21	14.10
(ATT DNK 12-17)			0.00			1/2" Ice	1.24	0.27	21.26
			0.00			1" Ice	1.38	0.35	30.32
(2) LGP21401 Diplexer	C	From Leg	1.50	0.0000	140.00	No Ice	1.10	0.21	14.10
(ATT DNK 12-17)			0.00			1/2" Ice	1.24	0.27	21.26
			0.00			1" Ice	1.38	0.35	30.32
PM-SU35-48 - Pipe Mount	A	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint)			0.00			1" Ice	5.73	5.73	205.59
PM-SU35-48 - Pipe Mount	B	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint)			0.00			1" Ice	5.73	5.73	205.59
PM-SU35-48 - Pipe Mount	C	From Leg	1.50	0.0000	97.00	No Ice	5.07	5.07	112.00
48"			0.00			1/2" Ice	5.39	5.39	156.37
(Sprint)			0.00			1" Ice	5.73	5.73	205.59

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
HPD2-4.7	C	Paraboloid	From	0.50	Worst		140.00	2.00	No Ice	3.14	27.00
(NWCT)		w/Shroud (HP)	Face	0.00					1/2" Ice	3.41	44.50
				0.00					1" Ice	3.68	62.00
6' w/ Radome	A	Paraboloid	From	1.00	Worst		106.50	6.00	No Ice	28.27	230.00

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight lb
(DNK-5 / CSP-6)		w/Radome	Leg	0.00					1/2" Ice	29.07	340.00
				0.00					1" Ice	29.86	450.00
6' w/ Radome	C	Paraboloid	From	1.00	Worst		107.00	6.00	No Ice	28.27	230.00
(DNK-6 / CSP-7)		w/Radome	Leg	0.00					1/2" Ice	29.07	340.00
				0.00					1" Ice	29.86	450.00

222-G Verification Constants

Constant	Value
Wind Importance Factor Without Ice	1.15
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1.25
K_d	0.85
Z_g	900
α	9.5
K_{zmin}	0.85
K_e	1
K_t	0.53
f	2

222-G Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_r w/Ice ft²	A_rR_r ft²	A_rR_r w/Ice ft²
T1	1	P.5x.250	53.414	51.698	C	0.175	0.401	4.171	8.053	1.992	5.126
160.00-150.00											
	1	P.5x.250	53.414	51.698	A	0.175	0.401	4.171	8.053	1.992	5.126
	2	P.5x.250	53.414	51.698	C	0.175	0.401	4.171	8.053	1.992	5.126
	2	P.5x.250	53.414	51.698	B	0.175	0.401	4.171	8.053	1.992	5.126
	3	P.5x.250	53.414	51.698	B	0.175	0.401	4.171	8.053	1.992	5.126
	3	P.5x.250	53.414	51.698	A	0.175	0.401	4.171	8.053	1.992	5.126
					A		Sum:	8.342	16.105	3.984	10.252
					B			8.342	16.105	3.984	10.252
					C			8.342	16.105	3.984	10.252
T2	22	P.5x.250	53.713	52.006	C	0.13	0.301	10.428	20.139	4.790	12.066
150.00-125.00											
	22	P.5x.250	53.713	52.006	A	0.13	0.301	10.428	20.139	4.790	12.066
	23	P.5x.250	53.713	52.006	C	0.13	0.301	10.428	20.139	4.790	12.066
	23	P.5x.250	53.713	52.006	B	0.13	0.301	10.428	20.139	4.790	12.066
	24	P.5x.250	53.713	52.006	B	0.13	0.301	10.428	20.139	4.790	12.066
	24	P.5x.250	53.713	52.006	A	0.13	0.301	10.428	20.139	4.790	12.066
					A		Sum:	20.856	40.277	9.580	24.131
					B			20.856	40.277	9.580	24.131
					C			20.856	40.277	9.580	24.131
T3	52	P.5x.250	54.318	52.657	C	0.122	0.281	10.428	20.164	4.731	11.961
125.00-100.00											
	52	P.5x.250	54.318	52.657	A	0.122	0.281	10.428	20.164	4.731	11.961
	53	P.5x.250	54.318	52.657	C	0.122	0.281	10.428	20.164	4.731	11.961
	53	P.5x.250	54.318	52.657	B	0.122	0.281	10.428	20.164	4.731	11.961
	54	P.5x.250	54.318	52.657	B	0.122	0.281	10.428	20.164	4.731	11.961
	54	P.5x.250	54.318	52.657	A	0.122	0.281	10.428	20.164	4.731	11.961

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
					A		Sum:	20.856	40.327	9.461	23.923
					B			20.856	40.327	9.461	23.923
					C			20.856	40.327	9.461	23.923
T4 100.00-75.00	91	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	C	0.14	0.286	15.101	24.874	6.248	14.793
	91	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	A	0.14	0.286	15.101	24.874	6.248	14.793
	92	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	C	0.14	0.286	15.101	24.874	6.248	14.793
	92	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	B	0.14	0.286	15.101	24.874	6.248	14.793
	93	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	B	0.14	0.286	15.101	24.874	6.248	14.793
	93	P5x0.3 w/ (3) 1.5x5/8 Plates	79.844	57.301	A	0.14	0.286	15.101	24.874	6.248	14.793
					A		Sum:	30.202	49.748	12.496	29.586
					B			30.202	49.748	12.496	29.586
					C			30.202	49.748	12.496	29.586
T5 75.00-66.67	130	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	C	0.134	0.275	5.034	8.299	2.066	4.910
	130	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	A	0.134	0.275	5.034	8.299	2.066	4.910
	131	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	C	0.134	0.275	5.034	8.299	2.066	4.910
	131	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	B	0.134	0.275	5.034	8.299	2.066	4.910
	132	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	B	0.134	0.275	5.034	8.299	2.066	4.910
	132	P5x0.4 w/ (3) 1.5x5/8 Plates	80.757	57.998	A	0.134	0.275	5.034	8.299	2.066	4.910
					A		Sum:	10.067	16.598	4.133	9.819
					B			10.067	16.598	4.133	9.819
					C			10.067	16.598	4.133	9.819
T6 66.67-58.33	145	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	C	0.131	0.27	5.034	8.301	2.059	4.900
	145	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	A	0.131	0.27	5.034	8.301	2.059	4.900
	146	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	C	0.131	0.27	5.034	8.301	2.059	4.900
	146	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	B	0.131	0.27	5.034	8.301	2.059	4.900
	147	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	B	0.131	0.27	5.034	8.301	2.059	4.900
	147	P5x0.4 w/ (3) 1.5x5/8 Plates	81.216	58.34	A	0.131	0.27	5.034	8.301	2.059	4.900
					A		Sum:	10.067	16.603	4.119	9.800
					B			10.067	16.603	4.119	9.800
					C			10.067	16.603	4.119	9.800
T7 58.33-50.00	160	HSS5x.4	56.379	54.836	C	0.131	0.32	3.476	6.743	1.553	4.082
	160	HSS5x.4	56.379	54.836	A	0.131	0.32	3.476	6.743	1.553	4.082
	161	HSS5x.4	56.379	54.836	C	0.131	0.32	3.476	6.743	1.553	4.082
	161	HSS5x.4	56.379	54.836	B	0.131	0.32	3.476	6.743	1.553	4.082
	162	HSS5x.4	56.379	54.836	B	0.131	0.32	3.476	6.743	1.553	4.082
	162	HSS5x.4	56.379	54.836	A	0.131	0.32	3.476	6.743	1.553	4.082
					A		Sum:	6.952	13.487	3.106	8.165
					B			6.952	13.487	3.106	8.165
					C			6.952	13.487	3.106	8.165
T8 50.00-37.50	187	HSS6.875x.4	77.918	65.716	C	0.118	0.23	7.169	12.060	2.890	6.999
	187	HSS6.875x.4	77.918	65.716	A	0.118	0.23	7.169	12.060	2.890	6.999
	188	HSS6.875x.4	77.918	65.716	C	0.118	0.23	7.169	12.060	2.890	6.999

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_r w/Ice ft²	A_rR_r ft²	A_rR_r w/Ice ft²
	188	HSS6.875x.4	77.918	65.716	B	0.118	0.23	7.169	12.060	2.890	6.999
	189	HSS6.875x.4	77.918	65.716	B	0.118	0.23	7.169	12.060	2.890	6.999
	189	HSS6.875x.4	77.918	65.716	A	0.118	0.23	7.169	12.060	2.890	6.999
					A		Sum:	14.338	24.121	5.780	13.998
					B			14.338	24.121	5.780	13.998
					C			14.338	24.121	5.780	13.998
T9 37.50-25.00	202	HSS6.875x.4	78.005	65.575	C	0.129	0.272	7.169	12.021	2.929	7.102
	202	HSS6.875x.4	78.005	65.575	A	0.129	0.272	7.169	12.021	2.929	7.102
	203	HSS6.875x.4	78.005	65.575	C	0.129	0.272	7.169	12.021	2.929	7.102
	203	HSS6.875x.4	78.005	65.575	B	0.129	0.272	7.169	12.021	2.929	7.102
	204	HSS6.875x.4	78.005	65.575	B	0.129	0.272	7.169	12.021	2.929	7.102
	204	HSS6.875x.4	78.005	65.575	A	0.129	0.272	7.169	12.021	2.929	7.102
					A		Sum:	14.338	24.042	5.858	14.204
					B			14.338	24.042	5.858	14.204
					C			14.338	24.042	5.858	14.204
T10 25.00-0.00	229	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	C	0.133	0.23	20.293	29.543	8.324	17.147
	229	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	A	0.133	0.23	20.293	29.543	8.324	17.147
	230	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	C	0.133	0.23	20.293	29.543	8.324	17.147
	230	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	B	0.133	0.23	20.293	29.543	8.324	17.147
	231	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	B	0.133	0.23	20.293	29.543	8.324	17.147
	231	HSS6.875x0.5 w/ (3) 2x5/8 Bars	108.841	71.147	A	0.133	0.23	20.293	29.543	8.324	17.147
					A		Sum:	40.587	59.085	16.648	34.293
					B			40.587	59.085	16.648	34.293
					C			40.587	59.085	16.648	34.293

222-G Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 160.00-150.00	155.00		1.388	5.82	1.19		36	A	0.175	3.984
								B	0.175	3.984
								C	0.175	3.984
T2 150.00-125.00	137.50		1.353	4.771	1.235		36	A	0.13	9.580
								B	0.13	9.580
								C	0.13	9.580
T3 125.00-100.00	112.50		1.297	3.591	1.317		37	A	0.122	9.461
								B	0.122	9.461
								C	0.122	9.461
T4 100.00-75.00	87.50		1.231	2.703	1.431		38	A	0.14	12.496
								B	0.14	12.496
								C	0.14	12.496
T5 75.00-66.67	70.83		1.177	2.237	1.53		39	A	0.134	4.133
								B	0.134	4.133
								C	0.134	4.133
T6 66.67-58.33	62.50		1.146	2.034	1.589		39	A	0.131	4.119

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
								B	0.131	4.119
								C	0.131	4.119
T7 58.33-50.00	54.17		1.112	1.851	1.655		40	A	0.131	3.106
								B	0.131	3.106
								C	0.131	3.106
T8 50.00-37.50	43.75		1.063	1.644	1.749		40	A	0.118	5.780
								B	0.118	5.780
								C	0.118	5.780
T9 37.50-25.00	31.25		0.991	1.426	1.881		40	A	0.129	5.858
								B	0.129	5.858
								C	0.129	5.858
T10 25.00-0.00	12.50		0.85	1.153	2.131		39	A	0.133	16.648
								B	0.133	16.648
								C	0.133	16.648

222-G Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 160.00-150.00	155.00	155.00	1.388	5.82	1.19	2.3264	9	A	0.401	22.167
								B	0.401	22.167
								C	0.401	22.167
T2 150.00-125.00	137.50	137.50	1.353	4.771	1.235	2.3281	9	A	0.301	45.954
								B	0.301	45.954
								C	0.301	45.954
T3 125.00-100.00	112.50	112.50	1.297	3.591	1.317	2.3341	9	A	0.281	47.877
								B	0.281	47.877
								C	0.281	47.877
T4 100.00-75.00	87.50	87.50	1.231	2.703	1.431	2.3431	10	A	0.286	55.787
								B	0.286	55.787
								C	0.286	55.787
T5 75.00-66.67	70.83	70.83	1.177	2.237	1.53	2.3487	10	A	0.275	19.049
								B	0.275	19.049
								C	0.275	19.049
T6 66.67-58.33	62.50	62.50	1.146	2.034	1.589	2.3503	10	A	0.27	19.286
								B	0.27	19.286
								C	0.27	19.286
T7 58.33-50.00	54.17	54.17	1.112	1.851	1.655	2.3501	10	A	0.32	22.989
								B	0.32	22.989
								C	0.32	22.989
T8 50.00-37.50	43.75	43.75	1.063	1.644	1.749	2.3453	10	A	0.23	25.270
								B	0.23	25.270
								C	0.23	25.270
T9 37.50-25.00	31.25	31.25	0.991	1.426	1.881	2.3264	10	A	0.272	31.470
								B	0.272	31.470
								C	0.272	31.470
T10 25.00-0.00	12.50	12.50	0.85	1.153	2.131	2.2174	10	A	0.23	57.132
								B	0.23	57.132
								C	0.23	57.132

222-G Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 160.00-150.00	155.00		1.388	5.82	1.19		13	A	0.175	3.984
								B	0.175	3.984
								C	0.175	3.984
T2 150.00-125.00	137.50		1.353	4.771	1.235		13	A	0.13	9.580
								B	0.13	9.580
								C	0.13	9.580
T3 125.00-100.00	112.50		1.297	3.591	1.317		13	A	0.122	9.461
								B	0.122	9.461
								C	0.122	9.461
T4 100.00-75.00	87.50		1.231	2.703	1.431		14	A	0.14	12.496
								B	0.14	12.496
								C	0.14	12.496
T5 75.00-66.67	70.83		1.177	2.237	1.53		14	A	0.134	4.133
								B	0.134	4.133
								C	0.134	4.133
T6 66.67-58.33	62.50		1.146	2.034	1.589		14	A	0.131	4.119
								B	0.131	4.119
								C	0.131	4.119
T7 58.33-50.00	54.17		1.112	1.851	1.655		14	A	0.131	3.106
								B	0.131	3.106
								C	0.131	3.106
T8 50.00-37.50	43.75		1.063	1.644	1.749		15	A	0.118	5.780
								B	0.118	5.780
								C	0.118	5.780
T9 37.50-25.00	31.25		0.991	1.426	1.881		15	A	0.129	5.858
								B	0.129	5.858
								C	0.129	5.858
T10 25.00-0.00	12.50		0.85	1.153	2.131		14	A	0.133	16.648
								B	0.133	16.648
								C	0.133	16.648

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	155.00	1.388	36	110.170	A	10.889	8.342	8.342	43.38	0.000	0.000
160.00-150.00					B	10.889	8.342		43.38	13.484	0.000
					C	10.889	8.342		43.38	0.000	0.000
T2	137.50	1.353	36	310.425	A	19.557	20.856	20.856	51.61	0.000	0.000
150.00-125.00					B	19.557	20.856		51.61	98.660	0.000
					C	19.557	20.856		51.61	0.000	0.000
T3	112.50	1.297	37	360.425	A	23.281	20.856	20.856	47.25	0.000	0.000
125.00-100.00					B	23.281	20.856		47.25	140.472	0.000
					C	23.281	20.856		47.25	59.400	0.000
T4	87.50	1.231	38	416.680	A	28.204	30.202	30.202	51.71	0.000	0.000
100.00-75.00					B	28.204	30.202		51.71	151.116	0.000
					C	28.204	30.202		51.71	70.550	0.000
T5 75.00-66.67	70.83	1.177	39	150.004	A	9.964	10.067	10.067	50.26	0.000	0.000
					B	9.964	10.067		50.26	52.353	0.000
					C	9.964	10.067		50.26	23.967	0.000
T6 66.67-58.33	62.50	1.146	39	155.560	A	10.257	10.067	10.067	49.53	0.000	0.000
					B	10.257	10.067		49.53	52.339	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	10.257	10.067		49.53	23.967	0.000
T7 58.33-50.00	54.17	1.112	40	159.031	A	13.957	6.952	6.952	33.25	0.000	0.000
					B	13.957	6.952		33.25	52.327	0.000
					C	13.957	6.952		33.25	23.967	0.000
T8 50.00-37.50	43.75	1.063	40	250.917	A	15.266	14.338	14.338	48.43	0.000	0.000
					B	15.266	14.338		48.43	78.472	0.000
					C	15.266	14.338		48.43	35.950	0.000
T9 37.50-25.00	31.25	0.991	40	263.417	A	19.771	14.338	14.338	42.04	0.000	0.000
					B	19.771	14.338		42.04	78.468	0.000
					C	19.771	14.338		42.04	35.950	0.000
T10 25.00-0.00	12.50	0.85	39	572.674	A	35.491	40.587	40.587	53.35	0.000	0.000
					B	35.491	40.587		53.35	157.038	0.000
					C	35.491	40.587		53.35	71.900	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	155.00	1.388	9	2.3264	114.050	A	10.889	34.822	16.105	35.23	0.000	0.000
160.00-150.00						B	10.889	34.822		35.23	69.238	0.000
						C	10.889	34.822		35.23	0.000	0.000
T2	137.50	1.353	9	2.3281	320.133	A	19.557	76.701	40.277	41.84	0.000	0.000
150.00-125.00						B	19.557	76.701		41.84	377.244	0.000
						C	19.557	76.701		41.84	0.000	0.000
T3	112.50	1.297	9	2.3341	370.158	A	23.281	80.707	40.327	38.78	0.000	0.000
125.00-100.00						B	23.281	80.707		38.78	498.307	0.000
						C	23.281	80.707		38.78	89.051	0.000
T4 100.00-75.00	87.50	1.231	10	2.3431	426.451	A	28.204	93.804	49.748	40.77	0.000	0.000
						B	28.204	93.804		40.77	531.086	0.000
						C	28.204	93.804		40.77	130.070	0.000
T5 75.00-66.67	70.83	1.177	10	2.3487	153.269	A	9.964	32.201	16.598	39.37	0.000	0.000
						B	9.964	32.201		39.37	186.028	0.000
						C	9.964	32.201		39.37	45.040	0.000
T6 66.67-58.33	62.50	1.146	10	2.3503	158.827	A	10.257	32.674	16.603	38.67	0.000	0.000
						B	10.257	32.674		38.67	186.106	0.000
						C	10.257	32.674		38.67	45.048	0.000
T7 58.33-50.00	54.17	1.112	10	2.3501	162.297	A	13.957	37.974	13.487	25.97	0.000	0.000
						B	13.957	37.974		25.97	186.096	0.000
						C	13.957	37.974		25.97	45.047	0.000
T8 50.00-37.50	43.75	1.063	10	2.3453	255.807	A	15.266	43.542	24.121	41.02	0.000	0.000
						B	15.266	43.542		41.02	278.793	0.000
						C	15.266	43.542		41.02	67.532	0.000
T9 37.50-25.00	31.25	0.991	10	2.3264	268.268	A	19.771	53.268	24.042	32.92	0.000	0.000
						B	19.771	53.268		32.92	277.413	0.000
						C	19.771	53.268		32.92	67.377	0.000
T10 25.00-0.00	12.50	0.85	10	2.2174	581.921	A	35.491	98.435	59.085	44.12	0.000	0.000
						B	35.491	98.435		44.12	538.887	0.000
						C	35.491	98.435		44.12	132.973	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	155.00	1.388	13	110.170	A	10.889	8.342	8.342	43.38	0.000	0.000
160.00-150.00					B	10.889	8.342		43.38	13.484	0.000
					C	10.889	8.342		43.38	0.000	0.000
T2	137.50	1.353	13	310.425	A	19.557	20.856	20.856	51.61	0.000	0.000
150.00-125.00					B	19.557	20.856		51.61	98.660	0.000
					C	19.557	20.856		51.61	0.000	0.000
T3	112.50	1.297	13	360.425	A	23.281	20.856	20.856	47.25	0.000	0.000
125.00-100.00					B	23.281	20.856		47.25	140.472	0.000
					C	23.281	20.856		47.25	59.400	0.000
T4	87.50	1.231	14	416.680	A	28.204	30.202	30.202	51.71	0.000	0.000
100.00-75.00					B	28.204	30.202		51.71	151.116	0.000
					C	28.204	30.202		51.71	70.550	0.000
T5 75.00-66.67	70.83	1.177	14	150.004	A	9.964	10.067	10.067	50.26	0.000	0.000
					B	9.964	10.067		50.26	52.353	0.000
					C	9.964	10.067		50.26	23.967	0.000
T6 66.67-58.33	62.50	1.146	14	155.560	A	10.257	10.067	10.067	49.53	0.000	0.000
					B	10.257	10.067		49.53	52.339	0.000
					C	10.257	10.067		49.53	23.967	0.000
T7 58.33-50.00	54.17	1.112	14	159.031	A	13.957	6.952	6.952	33.25	0.000	0.000
					B	13.957	6.952		33.25	52.327	0.000
					C	13.957	6.952		33.25	23.967	0.000
T8 50.00-37.50	43.75	1.063	15	250.917	A	15.266	14.338	14.338	48.43	0.000	0.000
					B	15.266	14.338		48.43	78.472	0.000
					C	15.266	14.338		48.43	35.950	0.000
T9 37.50-25.00	31.25	0.991	15	263.417	A	19.771	14.338	14.338	42.04	0.000	0.000
					B	19.771	14.338		42.04	78.468	0.000
					C	19.771	14.338		42.04	35.950	0.000
T10 25.00-0.00	12.50	0.85	14	572.674	A	35.491	40.587	40.587	53.35	0.000	0.000
					B	35.491	40.587		53.35	157.038	0.000
					C	35.491	40.587		53.35	71.900	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	36	1	1	14.873	1540.72	154.07	C
160.00-150.00			B	0.175	2.683		1	1	14.873			
			C	0.175	2.683		1	1	14.873			
T2	409.01	2323.89	A	0.13	2.846	36	1	1	29.136	4706.11	188.24	C
150.00-125.00			B	0.13	2.846		1	1	29.136			
			C	0.13	2.846		1	1	29.136			
T3	907.24	3860.01	A	0.122	2.875	37	1	1	32.743	7132.79	285.31	C
125.00-100.00			B	0.122	2.875		1	1	32.743			
			C	0.122	2.875		1	1	32.743			
T4	1030.36	5084.15	A	0.14	2.808	38	1	1	40.700	8423.30	336.93	C
100.00-75.00			B	0.14	2.808		1	1	40.700			
			C	0.14	2.808		1	1	40.700			
T5	361.81	2103.33	A	0.134	2.833	39	1	1	14.097	2981.33	357.76	C
75.00-66.67			B	0.134	2.833		1	1	14.097			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.134	2.833		1	1	14.097			
T6	361.81	2140.98	A	0.131	2.844	39	1	1	14.376	3046.62	365.59	C
66.67-58.33			B	0.131	2.844		1	1	14.376			
			C	0.131	2.844		1	1	14.376			
T7	361.81	2316.33	A	0.131	2.841	40	1	1	17.063	3335.42	400.25	C
58.33-50.00			B	0.131	2.841		1	1	17.063			
			C	0.131	2.841		1	1	17.063			
T8	542.71	3003.52	A	0.118	2.893	40	1	1	21.047	4649.30	371.94	C
50.00-37.50			B	0.118	2.893		1	1	21.047			
			C	0.118	2.893		1	1	21.047			
T9	542.71	3416.13	A	0.129	2.848	40	1	1	25.629	5075.04	406.00	C
37.50-25.00			B	0.129	2.848		1	1	25.629			
			C	0.129	2.848		1	1	25.629			
T10	1085.43	8678.73	A	0.133	2.836	39	1	1	52.139	9929.61	397.18	C
25.00-0.00			B	0.133	2.836		1	1	52.139			
			C	0.133	2.836		1	1	52.139			
Sum Weight:	5647.68	34108.77						OTM	3493.76 kip-ft	50820.24		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	36	0.825	1	12.967	1385.31	138.53	C
160.00-150.00			B	0.175	2.683		0.825	1	12.967			
			C	0.175	2.683		0.825	1	12.967			
T2	409.01	2323.89	A	0.13	2.846	36	0.825	1	25.714	4406.75	176.27	C
150.00-125.00			B	0.13	2.846		0.825	1	25.714			
			C	0.13	2.846		0.825	1	25.714			
T3	907.24	3860.01	A	0.122	2.875	37	0.825	1	28.668	6764.55	270.58	C
125.00-100.00			B	0.122	2.875		0.825	1	28.668			
			C	0.122	2.875		0.825	1	28.668			
T4	1030.36	5084.15	A	0.14	2.808	38	0.825	1	35.765	7974.45	318.98	C
100.00-75.00			B	0.14	2.808		0.825	1	35.765			
			C	0.14	2.808		0.825	1	35.765			
T5	361.81	2103.33	A	0.134	2.833	39	0.825	1	12.353	2817.66	338.12	C
75.00-66.67			B	0.134	2.833		0.825	1	12.353			
			C	0.134	2.833		0.825	1	12.353			
T6	361.81	2140.98	A	0.131	2.844	39	0.825	1	12.581	2875.56	345.07	C
66.67-58.33			B	0.131	2.844		0.825	1	12.581			
			C	0.131	2.844		0.825	1	12.581			
T7	361.81	2316.33	A	0.131	2.841	40	0.825	1	14.621	3100.45	372.05	C
58.33-50.00			B	0.131	2.841		0.825	1	14.621			
			C	0.131	2.841		0.825	1	14.621			
T8	542.71	3003.52	A	0.118	2.893	40	0.825	1	18.375	4384.90	350.79	C
50.00-37.50			B	0.118	2.893		0.825	1	18.375			
			C	0.118	2.893		0.825	1	18.375			
T9	542.71	3416.13	A	0.129	2.848	40	0.825	1	22.169	4737.12	378.97	C
37.50-25.00			B	0.129	2.848		0.825	1	22.169			
			C	0.129	2.848		0.825	1	22.169			
T10	1085.43	8678.73	A	0.133	2.836	39	0.825	1	45.928	9342.71	373.71	C
25.00-0.00			B	0.133	2.836		0.825	1	45.928			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	5647.68	34108.77	C	0.133	2.836		0.825	1 OTM	45.928 3283.33 kip-ft	47789.45		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	36	0.8	1	12.695	1363.11	136.31	C
160.00-150.00			B	0.175	2.683		0.8	1	12.695			
			C	0.175	2.683		0.8	1	12.695			
T2	409.01	2323.89	A	0.13	2.846	36	0.8	1	25.225	4363.98	174.56	C
150.00-125.00			B	0.13	2.846		0.8	1	25.225			
			C	0.13	2.846		0.8	1	25.225			
T3	907.24	3860.01	A	0.122	2.875	37	0.8	1	28.086	6711.94	268.48	C
125.00-100.00			B	0.122	2.875		0.8	1	28.086			
			C	0.122	2.875		0.8	1	28.086			
T4	1030.36	5084.15	A	0.14	2.808	38	0.8	1	35.060	7910.32	316.41	C
100.00-75.00			B	0.14	2.808		0.8	1	35.060			
			C	0.14	2.808		0.8	1	35.060			
T5	361.81	2103.33	A	0.134	2.833	39	0.8	1	12.104	2794.27	335.31	C
75.00-66.67			B	0.134	2.833		0.8	1	12.104			
			C	0.134	2.833		0.8	1	12.104			
T6	361.81	2140.98	A	0.131	2.844	39	0.8	1	12.324	2851.13	342.14	C
66.67-58.33			B	0.131	2.844		0.8	1	12.324			
			C	0.131	2.844		0.8	1	12.324			
T7	361.81	2316.33	A	0.131	2.841	40	0.8	1	14.272	3066.88	368.03	C
58.33-50.00			B	0.131	2.841		0.8	1	14.272			
			C	0.131	2.841		0.8	1	14.272			
T8	542.71	3003.52	A	0.118	2.893	40	0.8	1	17.994	4347.13	347.77	C
50.00-37.50			B	0.118	2.893		0.8	1	17.994			
			C	0.118	2.893		0.8	1	17.994			
T9	542.71	3416.13	A	0.129	2.848	40	0.8	1	21.675	4688.85	375.11	C
37.50-25.00			B	0.129	2.848		0.8	1	21.675			
			C	0.129	2.848		0.8	1	21.675			
T10	1085.43	8678.73	A	0.133	2.836	39	0.8	1	45.041	9258.86	370.35	C
25.00-0.00			B	0.133	2.836		0.8	1	45.041			
			C	0.133	2.836		0.8	1	45.041			
Sum Weight:	5647.68	34108.77						OTM	3253.27 kip-ft	47356.48		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	36	0.85	1	13.239	1407.51	140.75	C
160.00-150.00			B	0.175	2.683		0.85	1	13.239			
			C	0.175	2.683		0.85	1	13.239			
T2	409.01	2323.89	A	0.13	2.846	36	0.85	1	26.203	4449.52	177.98	C
150.00-125.00			B	0.13	2.846		0.85	1	26.203			
			C	0.13	2.846		0.85	1	26.203			
T3	907.24	3860.01	A	0.122	2.875	37	0.85	1	29.250	6817.15	272.69	C
125.00-100.00			B	0.122	2.875		0.85	1	29.250			
			C	0.122	2.875		0.85	1	29.250			
T4	1030.36	5084.15	A	0.14	2.808	38	0.85	1	36.470	8038.57	321.54	C
100.00-75.00			B	0.14	2.808		0.85	1	36.470			
			C	0.14	2.808		0.85	1	36.470			
T5	361.81	2103.33	A	0.134	2.833	39	0.85	1	12.603	2841.04	340.92	C
75.00-66.67			B	0.134	2.833		0.85	1	12.603			
			C	0.134	2.833		0.85	1	12.603			
T6	361.81	2140.98	A	0.131	2.844	39	0.85	1	12.837	2900.00	348.00	C
66.67-58.33			B	0.131	2.844		0.85	1	12.837			
			C	0.131	2.844		0.85	1	12.837			
T7	361.81	2316.33	A	0.131	2.841	40	0.85	1	14.970	3134.01	376.08	C
58.33-50.00			B	0.131	2.841		0.85	1	14.970			
			C	0.131	2.841		0.85	1	14.970			
T8	542.71	3003.52	A	0.118	2.893	40	0.85	1	18.757	4422.67	353.81	C
50.00-37.50			B	0.118	2.893		0.85	1	18.757			
			C	0.118	2.893		0.85	1	18.757			
T9	542.71	3416.13	A	0.129	2.848	40	0.85	1	22.663	4785.39	382.83	C
37.50-25.00			B	0.129	2.848		0.85	1	22.663			
			C	0.129	2.848		0.85	1	22.663			
T10	1085.43	8678.73	A	0.133	2.836	39	0.85	1	46.816	9426.55	377.06	C
25.00-0.00			B	0.133	2.836		0.85	1	46.816			
			C	0.133	2.836		0.85	1	46.816			
Sum Weight:	5647.68	34108.77						OTM	3313.39 kip-ft	48222.42		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	973.95	4811.28	A	0.401	2.062	9	1	1	33.056	919.14	91.91	C
160.00-150.00			B	0.401	2.062		1	1	33.056			
			C	0.401	2.062		1	1	33.056			
T2	6093.04	9531.09	A	0.301	2.294	9	1	1	65.511	3184.80	127.39	C
150.00-125.00			B	0.301	2.294		1	1	65.511			
			C	0.301	2.294		1	1	65.511			
T3	10938.57	12846.86	A	0.281	2.348	9	1	1	71.158	4404.16	176.17	C
125.00-100.00			B	0.281	2.348		1	1	71.158			
			C	0.281	2.348		1	1	71.158			
T4	12150.78	16522.28	A	0.286	2.334	10	1	1	83.991	5134.24	205.37	C
100.00-75.00			B	0.286	2.334		1	1	83.991			
			C	0.286	2.334		1	1	83.991			
T5	4257.01	6088.78	A	0.275	2.364	10	1	1	29.014	1831.46	219.78	C
75.00-66.67			B	0.275	2.364		1	1	29.014			
			C	0.275	2.364		1	1	29.014			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	4260.19	6218.81	A	0.27	2.378	10	1	1	29.543	1866.78	224.01	C
66.67-58.33			B	0.27	2.378		1	1	29.543			
			C	0.27	2.378		1	1	29.543			
T7	4259.78	7092.54	A	0.32	2.244	10	1	1	36.947	1994.24	239.31	C
58.33-50.00			B	0.32	2.244		1	1	36.947			
			C	0.32	2.244		1	1	36.947			
T8	6375.32	8354.74	A	0.23	2.499	10	1	1	40.536	2821.55	225.72	C
50.00-37.50			B	0.23	2.499		1	1	40.536			
			C	0.23	2.499		1	1	40.536			
T9	6319.07	9985.80	A	0.272	2.372	10	1	1	51.241	2993.76	239.50	C
37.50-25.00			B	0.272	2.372		1	1	51.241			
			C	0.272	2.372		1	1	51.241			
T10	11998.27	21412.84	A	0.23	2.498	10	1	1	92.623	5623.92	224.96	C
25.00-0.00			B	0.23	2.498		1	1	92.623			
			C	0.23	2.498		1	1	92.623			
Sum Weight:	67625.99	102865.02						OTM	2166.81 kip-ft	30774.05		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	973.95	4811.28	A	0.401	2.062	9	0.825	1	31.150	889.11	88.91	C
160.00-150.00			B	0.401	2.062		0.825	1	31.150			
			C	0.401	2.062		0.825	1	31.150			
T2	6093.04	9531.09	A	0.301	2.294	9	0.825	1	62.089	3124.14	124.97	C
150.00-125.00			B	0.301	2.294		0.825	1	62.089			
			C	0.301	2.294		0.825	1	62.089			
T3	10938.57	12846.86	A	0.281	2.348	9	0.825	1	67.084	4328.58	173.14	C
125.00-100.00			B	0.281	2.348		0.825	1	67.084			
			C	0.281	2.348		0.825	1	67.084			
T4	12150.78	16522.28	A	0.286	2.334	10	0.825	1	79.055	5040.48	201.62	C
100.00-75.00			B	0.286	2.334		0.825	1	79.055			
			C	0.286	2.334		0.825	1	79.055			
T5	4257.01	6088.78	A	0.275	2.364	10	0.825	1	27.270	1797.13	215.66	C
75.00-66.67			B	0.275	2.364		0.825	1	27.270			
			C	0.275	2.364		0.825	1	27.270			
T6	4260.19	6218.81	A	0.27	2.378	10	0.825	1	27.748	1830.83	219.70	C
66.67-58.33			B	0.27	2.378		0.825	1	27.748			
			C	0.27	2.378		0.825	1	27.748			
T7	4259.78	7092.54	A	0.32	2.244	10	0.825	1	34.504	1947.58	233.71	C
58.33-50.00			B	0.32	2.244		0.825	1	34.504			
			C	0.32	2.244		0.825	1	34.504			
T8	6375.32	8354.74	A	0.23	2.499	10	0.825	1	37.865	2764.13	221.13	C
50.00-37.50			B	0.23	2.499		0.825	1	37.865			
			C	0.23	2.499		0.825	1	37.865			
T9	6319.07	9985.80	A	0.272	2.372	10	0.825	1	47.781	2923.02	233.84	C
37.50-25.00			B	0.272	2.372		0.825	1	47.781			
			C	0.272	2.372		0.825	1	47.781			
T10	11998.27	21412.84	A	0.23	2.498	10	0.825	1	86.412	5493.95	219.76	C
25.00-0.00			B	0.23	2.498		0.825	1	86.412			
			C	0.23	2.498		0.825	1	86.412			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	67625.99	102865.02						OTM	2123.56 kip-ft	30138.95		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	973.95	4811.28	A	0.401	2.062	9	0.8	1	30.878	884.82	88.48	C
160.00-150.00			B	0.401	2.062		0.8	1	30.878			
			C	0.401	2.062		0.8	1	30.878			
T2	6093.04	9531.09	A	0.301	2.294	9	0.8	1	61.600	3115.48	124.62	C
150.00-125.00			B	0.301	2.294		0.8	1	61.600			
			C	0.301	2.294		0.8	1	61.600			
T3	10938.57	12846.86	A	0.281	2.348	9	0.8	1	66.502	4317.78	172.71	C
125.00-100.00			B	0.281	2.348		0.8	1	66.502			
			C	0.281	2.348		0.8	1	66.502			
T4	12150.78	16522.28	A	0.286	2.334	10	0.8	1	78.350	5027.08	201.08	C
100.00-75.00			B	0.286	2.334		0.8	1	78.350			
			C	0.286	2.334		0.8	1	78.350			
T5	4257.01	6088.78	A	0.275	2.364	10	0.8	1	27.021	1792.23	215.07	C
75.00-66.67			B	0.275	2.364		0.8	1	27.021			
			C	0.275	2.364		0.8	1	27.021			
T6	4260.19	6218.81	A	0.27	2.378	10	0.8	1	27.491	1825.70	219.08	C
66.67-58.33			B	0.27	2.378		0.8	1	27.491			
			C	0.27	2.378		0.8	1	27.491			
T7	4259.78	7092.54	A	0.32	2.244	10	0.8	1	34.155	1940.92	232.91	C
58.33-50.00			B	0.32	2.244		0.8	1	34.155			
			C	0.32	2.244		0.8	1	34.155			
T8	6375.32	8354.74	A	0.23	2.499	10	0.8	1	37.483	2755.93	220.47	C
50.00-37.50			B	0.23	2.499		0.8	1	37.483			
			C	0.23	2.499		0.8	1	37.483			
T9	6319.07	9985.80	A	0.272	2.372	10	0.8	1	47.287	2912.91	233.03	C
37.50-25.00			B	0.272	2.372		0.8	1	47.287			
			C	0.272	2.372		0.8	1	47.287			
T10	11998.27	21412.84	A	0.23	2.498	10	0.8	1	85.525	5475.38	219.02	C
25.00-0.00			B	0.23	2.498		0.8	1	85.525			
			C	0.23	2.498		0.8	1	85.525			
Sum Weight:	67625.99	102865.02						OTM	2117.38 kip-ft	30048.23		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	973.95	4811.28	A	0.401	2.062	9	0.85	1	31.423	893.40	89.34	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
160.00-150.00			B	0.401	2.062		0.85	1	31.423			
			C	0.401	2.062		0.85	1	31.423			
T2	6093.04	9531.09	A	0.301	2.294	9	0.85	1	62.578	3132.81	125.31	C
150.00-125.00			B	0.301	2.294		0.85	1	62.578			
			C	0.301	2.294		0.85	1	62.578			
T3	10938.57	12846.86	A	0.281	2.348	9	0.85	1	67.666	4339.38	173.58	C
125.00-100.00			B	0.281	2.348		0.85	1	67.666			
			C	0.281	2.348		0.85	1	67.666			
T4	12150.78	16522.28	A	0.286	2.334	10	0.85	1	79.760	5053.87	202.15	C
100.00-75.00			B	0.286	2.334		0.85	1	79.760			
			C	0.286	2.334		0.85	1	79.760			
T5	4257.01	6088.78	A	0.275	2.364	10	0.85	1	27.519	1802.04	216.24	C
75.00-66.67			B	0.275	2.364		0.85	1	27.519			
			C	0.275	2.364		0.85	1	27.519			
T6	4260.19	6218.81	A	0.27	2.378	10	0.85	1	28.004	1835.97	220.32	C
66.67-58.33			B	0.27	2.378		0.85	1	28.004			
			C	0.27	2.378		0.85	1	28.004			
T7	4259.78	7092.54	A	0.32	2.244	10	0.85	1	34.853	1954.25	234.51	C
58.33-50.00			B	0.32	2.244		0.85	1	34.853			
			C	0.32	2.244		0.85	1	34.853			
T8	6375.32	8354.74	A	0.23	2.499	10	0.85	1	38.246	2772.33	221.79	C
50.00-37.50			B	0.23	2.499		0.85	1	38.246			
			C	0.23	2.499		0.85	1	38.246			
T9	6319.07	9985.80	A	0.272	2.372	10	0.85	1	48.275	2933.12	234.65	C
37.50-25.00			B	0.272	2.372		0.85	1	48.275			
			C	0.272	2.372		0.85	1	48.275			
T10	11998.27	21412.84	A	0.23	2.498	10	0.85	1	87.300	5512.51	220.50	C
25.00-0.00			B	0.23	2.498		0.85	1	87.300			
			C	0.23	2.498		0.85	1	87.300			
Sum Weight:	67625.99	102865.02						OTM	2129.74 kip-ft	30229.68		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	13	1	1	14.873	557.65	55.77	C
160.00-150.00			B	0.175	2.683		1	1	14.873			
			C	0.175	2.683		1	1	14.873			
T2	409.01	2323.89	A	0.13	2.846	13	1	1	29.136	1703.34	68.13	C
150.00-125.00			B	0.13	2.846		1	1	29.136			
			C	0.13	2.846		1	1	29.136			
T3	907.24	3860.01	A	0.122	2.875	13	1	1	32.743	2581.66	103.27	C
125.00-100.00			B	0.122	2.875		1	1	32.743			
			C	0.122	2.875		1	1	32.743			
T4	1030.36	5084.15	A	0.14	2.808	14	1	1	40.700	3048.74	121.95	C
100.00-75.00			B	0.14	2.808		1	1	40.700			
			C	0.14	2.808		1	1	40.700			
T5	361.81	2103.33	A	0.134	2.833	14	1	1	14.097	1079.07	129.49	C
75.00-66.67			B	0.134	2.833		1	1	14.097			
			C	0.134	2.833		1	1	14.097			
T6	361.81	2140.98	A	0.131	2.844	14	1	1	14.376	1102.70	132.32	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
66.67-58.33			B	0.131	2.844		1	1	14.376			
			C	0.131	2.844		1	1	14.376			
T7	361.81	2316.33	A	0.131	2.841	14	1	1	17.063	1207.23	144.87	C
58.33-50.00			B	0.131	2.841		1	1	17.063			
			C	0.131	2.841		1	1	17.063			
T8	542.71	3003.52	A	0.118	2.893	15	1	1	21.047	1682.78	134.62	C
50.00-37.50			B	0.118	2.893		1	1	21.047			
			C	0.118	2.893		1	1	21.047			
T9	542.71	3416.13	A	0.129	2.848	15	1	1	25.629	1836.87	146.95	C
37.50-25.00			B	0.129	2.848		1	1	25.629			
			C	0.129	2.848		1	1	25.629			
T10	1085.43	8678.73	A	0.133	2.836	14	1	1	52.139	3593.94	143.76	C
25.00-0.00			B	0.133	2.836		1	1	52.139			
			C	0.133	2.836		1	1	52.139			
Sum Weight:	5647.68	34108.77						OTM	1264.54 kip-ft	18393.97		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	13	0.825	1	12.967	501.40	50.14	C
160.00-150.00			B	0.175	2.683		0.825	1	12.967			
			C	0.175	2.683		0.825	1	12.967			
T2	409.01	2323.89	A	0.13	2.846	13	0.825	1	25.714	1594.99	63.80	C
150.00-125.00			B	0.13	2.846		0.825	1	25.714			
			C	0.13	2.846		0.825	1	25.714			
T3	907.24	3860.01	A	0.122	2.875	13	0.825	1	28.668	2448.37	97.93	C
125.00-100.00			B	0.122	2.875		0.825	1	28.668			
			C	0.122	2.875		0.825	1	28.668			
T4	1030.36	5084.15	A	0.14	2.808	14	0.825	1	35.765	2886.29	115.45	C
100.00-75.00			B	0.14	2.808		0.825	1	35.765			
			C	0.14	2.808		0.825	1	35.765			
T5	361.81	2103.33	A	0.134	2.833	14	0.825	1	12.353	1019.83	122.38	C
75.00-66.67			B	0.134	2.833		0.825	1	12.353			
			C	0.134	2.833		0.825	1	12.353			
T6	361.81	2140.98	A	0.131	2.844	14	0.825	1	12.581	1040.79	124.89	C
66.67-58.33			B	0.131	2.844		0.825	1	12.581			
			C	0.131	2.844		0.825	1	12.581			
T7	361.81	2316.33	A	0.131	2.841	14	0.825	1	14.621	1122.18	134.66	C
58.33-50.00			B	0.131	2.841		0.825	1	14.621			
			C	0.131	2.841		0.825	1	14.621			
T8	542.71	3003.52	A	0.118	2.893	15	0.825	1	18.375	1587.08	126.97	C
50.00-37.50			B	0.118	2.893		0.825	1	18.375			
			C	0.118	2.893		0.825	1	18.375			
T9	542.71	3416.13	A	0.129	2.848	15	0.825	1	22.169	1714.56	137.16	C
37.50-25.00			B	0.129	2.848		0.825	1	22.169			
			C	0.129	2.848		0.825	1	22.169			
T10	1085.43	8678.73	A	0.133	2.836	14	0.825	1	45.928	3381.52	135.26	C
25.00-0.00			B	0.133	2.836		0.825	1	45.928			
			C	0.133	2.836		0.825	1	45.928			
Sum Weight:	5647.68	34108.77						OTM	1188.38	17297.00		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									kip-ft			

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	13	0.8	1	12.695	493.37	49.34	C
160.00-150.00			B	0.175	2.683		0.8	1	12.695			
			C	0.175	2.683		0.8	1	12.695			
T2	409.01	2323.89	A	0.13	2.846	13	0.8	1	25.225	1579.51	63.18	C
150.00-125.00			B	0.13	2.846		0.8	1	25.225			
			C	0.13	2.846		0.8	1	25.225			
T3	907.24	3860.01	A	0.122	2.875	13	0.8	1	28.086	2429.33	97.17	C
125.00-100.00			B	0.122	2.875		0.8	1	28.086			
			C	0.122	2.875		0.8	1	28.086			
T4	1030.36	5084.15	A	0.14	2.808	14	0.8	1	35.060	2863.08	114.52	C
100.00-75.00			B	0.14	2.808		0.8	1	35.060			
			C	0.14	2.808		0.8	1	35.060			
T5	361.81	2103.33	A	0.134	2.833	14	0.8	1	12.104	1011.36	121.36	C
75.00-66.67			B	0.134	2.833		0.8	1	12.104			
			C	0.134	2.833		0.8	1	12.104			
T6	361.81	2140.98	A	0.131	2.844	14	0.8	1	12.324	1031.94	123.83	C
66.67-58.33			B	0.131	2.844		0.8	1	12.324			
			C	0.131	2.844		0.8	1	12.324			
T7	361.81	2316.33	A	0.131	2.841	14	0.8	1	14.272	1110.03	133.20	C
58.33-50.00			B	0.131	2.841		0.8	1	14.272			
			C	0.131	2.841		0.8	1	14.272			
T8	542.71	3003.52	A	0.118	2.893	15	0.8	1	17.994	1573.41	125.87	C
50.00-37.50			B	0.118	2.893		0.8	1	17.994			
			C	0.118	2.893		0.8	1	17.994			
T9	542.71	3416.13	A	0.129	2.848	15	0.8	1	21.675	1697.09	135.77	C
37.50-25.00			B	0.129	2.848		0.8	1	21.675			
			C	0.129	2.848		0.8	1	21.675			
T10	1085.43	8678.73	A	0.133	2.836	14	0.8	1	45.041	3351.17	134.05	C
25.00-0.00			B	0.133	2.836		0.8	1	45.041			
			C	0.133	2.836		0.8	1	45.041			
Sum Weight:	5647.68	34108.77						OTM	1177.50 kip-ft	17140.29		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	44.80	1181.68	A	0.175	2.683	13	0.85	1	13.239	509.44	50.94	C
160.00-150.00			B	0.175	2.683		0.85	1	13.239			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.175	2.683		0.85	1	13.239			
T2	409.01	2323.89	A	0.13	2.846	13	0.85	1	26.203	1610.47	64.42	C
150.00-125.00			B	0.13	2.846		0.85	1	26.203			
			C	0.13	2.846		0.85	1	26.203			
T3	907.24	3860.01	A	0.122	2.875	13	0.85	1	29.250	2467.41	98.70	C
125.00-100.00			B	0.122	2.875		0.85	1	29.250			
			C	0.122	2.875		0.85	1	29.250			
T4	1030.36	5084.15	A	0.14	2.808	14	0.85	1	36.470	2909.49	116.38	C
100.00-75.00			B	0.14	2.808		0.85	1	36.470			
			C	0.14	2.808		0.85	1	36.470			
T5	361.81	2103.33	A	0.134	2.833	14	0.85	1	12.603	1028.29	123.39	C
75.00-66.67			B	0.134	2.833		0.85	1	12.603			
			C	0.134	2.833		0.85	1	12.603			
T6	361.81	2140.98	A	0.131	2.844	14	0.85	1	12.837	1049.63	125.96	C
66.67-58.33			B	0.131	2.844		0.85	1	12.837			
			C	0.131	2.844		0.85	1	12.837			
T7	361.81	2316.33	A	0.131	2.841	14	0.85	1	14.970	1134.33	136.12	C
58.33-50.00			B	0.131	2.841		0.85	1	14.970			
			C	0.131	2.841		0.85	1	14.970			
T8	542.71	3003.52	A	0.118	2.893	15	0.85	1	18.757	1600.75	128.06	C
50.00-37.50			B	0.118	2.893		0.85	1	18.757			
			C	0.118	2.893		0.85	1	18.757			
T9	542.71	3416.13	A	0.129	2.848	15	0.85	1	22.663	1732.03	138.56	C
37.50-25.00			B	0.129	2.848		0.85	1	22.663			
			C	0.129	2.848		0.85	1	22.663			
T10	1085.43	8678.73	A	0.133	2.836	14	0.85	1	46.816	3411.86	136.47	C
25.00-0.00			B	0.133	2.836		0.85	1	46.816			
			C	0.133	2.836		0.85	1	46.816			
Sum Weight:	5647.68	34108.77						OTM	1199.26 kip-ft	17453.71		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	11767.25					
Bracing Weight	22341.53					
Total Member Self-Weight	34108.77			3.06	-13.37	
Total Weight	49531.86			3.06	-13.37	
Wind 0 deg - No Ice		-180.21	-67031.58	-5437.38	7.46	74.33
Wind 30 deg - No Ice		32040.05	-55711.16	-4541.88	-2624.73	45.99
Wind 45 deg - No Ice		45098.60	-45127.96	-3680.39	-3695.92	28.27
Wind 60 deg - No Ice		54925.28	-31627.84	-2578.87	-4505.15	8.94
Wind 90 deg - No Ice		64392.23	180.21	23.89	-5272.18	-30.01
Wind 120 deg - No Ice		58105.20	33671.85	2741.33	-4734.25	-64.24
Wind 135 deg - No Ice		47129.16	47158.52	3839.26	-3848.67	-73.94
Wind 150 deg - No Ice		32352.18	55891.37	4568.84	-2660.81	-75.99
Wind 180 deg - No Ice		180.21	63567.81	5203.02	-34.20	-69.12
Wind 210 deg - No Ice		-32040.05	55711.16	4548.01	2598.00	-45.99
Wind 225 deg - No Ice		-45098.60	45127.96	3686.52	3669.18	-28.27
Wind 240 deg - No Ice		-57924.99	33359.72	2705.25	4686.68	-10.09
Wind 270 deg - No Ice		-64392.23	-180.21	-17.76	5245.44	30.01

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 300 deg - No Ice		-55105.49	-31939.97	-2614.95	4499.24	60.19
Wind 315 deg - No Ice		-47129.16	-47158.52	-3833.13	3821.93	73.94
Wind 330 deg - No Ice		-32352.18	-55891.37	-4562.71	2634.07	75.99
Member Ice	68756.24					
Total Weight Ice	208004.76			-120.99	-175.21	
Wind 0 deg - Ice		-38.91	-39373.50	-3376.67	-171.04	28.37
Wind 30 deg - Ice		19373.24	-33607.56	-2906.30	-1780.88	10.51
Wind 45 deg - Ice		27353.89	-27364.67	-2389.57	-2443.75	0.48
Wind 60 deg - Ice		33437.21	-19290.14	-1720.51	-2949.77	-9.53
Wind 90 deg - Ice		38813.89	38.91	-116.83	-3393.76	-27.10
Wind 120 deg - Ice		34104.70	19720.45	1510.45	-2996.75	-38.08
Wind 135 deg - Ice		27781.02	27791.80	2178.82	-2474.99	-39.42
Wind 150 deg - Ice		19440.64	33646.47	2668.48	-1788.10	-37.61
Wind 180 deg - Ice		38.91	38647.68	3085.25	-179.38	-27.59
Wind 210 deg - Ice		-19373.24	33607.56	2664.31	1430.46	-10.51
Wind 225 deg - Ice		-27353.89	27364.67	2147.58	2093.33	-0.48
Wind 240 deg - Ice		-34065.79	19653.05	1503.23	2642.16	9.71
Wind 270 deg - Ice		-38813.89	-38.91	-125.16	3043.34	27.10
Wind 300 deg - Ice		-33476.12	-19357.54	-1727.72	2603.52	37.12
Wind 315 deg - Ice		-27781.02	-27791.80	-2420.81	2124.57	39.42
Wind 330 deg - Ice		-19440.64	-33646.47	-2910.47	1437.67	37.61
Total Weight	49531.86			3.06	-13.37	
Wind 0 deg - Service		-65.23	-24261.53	-1970.15	11.68	26.90
Wind 30 deg - Service		11596.63	-20164.20	-1646.03	-941.02	16.64
Wind 45 deg - Service		16323.07	-16333.70	-1334.22	-1328.73	10.23
Wind 60 deg - Service		19879.76	-11447.44	-935.54	-1621.62	3.23
Wind 90 deg - Service		23306.24	65.23	6.51	-1899.24	-10.86
Wind 120 deg - Service		21030.70	12187.25	990.06	-1704.54	-23.25
Wind 135 deg - Service		17058.02	17068.64	1387.45	-1384.01	-26.76
Wind 150 deg - Service		11709.61	20229.42	1651.52	-954.08	-27.51
Wind 180 deg - Service		65.23	23007.85	1881.05	-3.40	-25.02
Wind 210 deg - Service		-11596.63	20164.20	1643.98	949.30	-16.64
Wind 225 deg - Service		-16323.07	16333.70	1332.17	1337.01	-10.23
Wind 240 deg - Service		-20965.48	12074.28	977.01	1705.29	-3.65
Wind 270 deg - Service		-23306.24	-65.23	-8.57	1907.52	10.86
Wind 300 deg - Service		-19944.98	-11560.41	-948.60	1637.44	21.78
Wind 315 deg - Service		-17058.02	-17068.64	-1389.51	1392.30	26.76
Wind 330 deg - Service		-11709.61	-20229.42	-1653.57	962.36	27.51

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice

Comb. No.	Description
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	160 - 150	Leg	Max Tension	29	647.22	-0.35	-0.01
			Max. Compression	35	-4053.30	-0.15	-0.04
			Max. Mx	28	495.85	0.45	-0.09
			Max. My	25	-347.51	-0.17	0.50
			Max. Vy	18	-558.39	0.00	0.00
			Max. Vx	10	901.74	0.00	0.00
		Diagonal	Max Tension	21	2406.32	0.00	0.00
			Max. Compression	20	-2525.70	0.00	0.00
			Max. Mx	34	-232.82	0.14	0.00
			Max. My	34	-213.51	0.00	0.00
			Max. Vy	34	-75.43	0.00	0.00
			Max. Vx	34	-2.35	0.00	0.00
		Horizontal	Max Tension	6	1954.40	0.02	0.00
			Max. Compression	25	-1954.37	0.00	0.00
			Max. Mx	48	-125.95	0.09	0.02
			Max. My	35	532.85	0.08	0.02
			Max. Vy	48	-81.45	0.09	0.02
			Max. Vx	35	5.36	0.00	0.00
		Top Girt	Max Tension	29	928.18	0.00	0.00
			Max. Compression	12	-958.97	0.02	0.00
			Max. Mx	48	-41.41	0.08	0.02
			Max. My	38	-317.27	0.08	0.02
			Max. Vy	48	78.25	0.08	0.02
			Max. Vx	38	5.20	0.00	0.00
T2	150 - 125	Leg	Max Tension	29	16264.90	-0.84	-0.10
			Max. Compression	35	-22651.01	0.12	-0.02
			Max. Mx	28	5468.84	2.30	-0.14
			Max. My	4	-1016.46	-0.06	2.34
			Max. Vy	28	-2885.78	-1.81	-0.14
			Max. Vx	20	2782.09	-0.02	1.68
		Diagonal	Max Tension	17	10718.57	0.00	0.00
			Max. Compression	16	-10835.86	0.00	0.00
			Max. Mx	34	-226.88	0.24	0.00
			Max. My	34	-202.79	0.00	-0.01
			Max. Vy	34	-89.22	0.00	0.00
			Max. Vx	34	-3.35	0.00	0.00
		Horizontal	Max Tension	30	6720.51	0.00	0.00
			Max. Compression	15	-6690.85	0.02	0.00
			Max. Mx	38	31.59	0.11	0.03
			Max. My	38	-493.44	0.11	0.03
			Max. Vy	38	80.19	0.11	0.03
			Max. Vx	35	-6.25	0.00	0.00
T3	125 - 100	Leg	Max Tension	29	58959.36	-0.46	-0.14
			Max. Compression	12	-70679.79	1.25	0.13
			Max. Mx	8	55850.33	-1.28	0.12
			Max. My	26	-6289.12	-0.04	-1.37
			Max. Vy	8	-981.37	-0.46	0.19
			Max. Vx	32	1128.62	-0.01	0.44
		Diagonal	Max Tension	17	15749.42	0.00	0.00
			Max. Compression	16	-16028.06	0.00	0.00
			Max. Mx	34	-449.39	0.35	0.00
			Max. My	34	-399.42	0.00	-0.01
			Max. Vy	34	-123.26	0.00	0.00
			Max. Vx	34	4.26	0.00	0.00
		Horizontal	Max Tension	30	10721.21	0.00	0.00
			Max. Compression	15	-10606.18	0.05	0.01
			Max. Mx	38	61.71	0.22	0.01
			Max. My	12	2131.24	0.00	-0.03
			Max. Vy	38	123.40	0.22	0.01
			Max. Vx	12	-4.58	0.00	-0.03
		Inner Bracing	Max Tension	13	6.59	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. Compression	43	-13.31	0.00	0.00
			Max. Mx	34	-9.90	-0.12	0.00
			Max. Vy	34	68.40	0.00	0.00
T4	100 - 75	Leg	Max Tension	29	121713.94	-0.27	-0.10
			Max. Compression	12	-142193.41	0.64	0.10
			Max. Mx	8	73185.14	2.54	-0.08
			Max. My	4	-6890.18	-0.02	2.67
			Max. Vy	8	-1326.64	-1.28	0.12
			Max. Vx	4	-1355.37	-0.02	-1.14
		Diagonal	Max Tension	33	22093.76	0.00	0.00
			Max. Compression	32	-22443.81	0.00	0.00
			Max. Mx	34	-646.72	0.44	0.00
			Max. My	34	-581.12	0.00	-0.01
			Max. Vy	34	-147.10	0.00	0.00
			Max. Vx	34	-4.76	0.00	0.00
		Horizontal	Max Tension	16	15959.57	0.10	-0.00
			Max. Compression	33	-15768.94	0.00	0.00
			Max. Mx	38	-238.54	0.30	0.01
			Max. My	12	260.15	0.04	-0.03
			Max. Vy	38	-159.30	0.30	0.01
			Max. Vx	12	-5.48	0.04	-0.03
		Top Girt	Max Tension	30	13097.35	0.00	0.00
			Max. Compression	15	-12988.18	0.04	0.01
			Max. Mx	38	-547.41	0.20	0.01
			Max. My	12	572.41	0.02	-0.03
			Max. Vy	38	118.95	0.20	0.01
			Max. Vx	12	-5.10	0.02	-0.03
		Inner Bracing	Max Tension	15	223.75	0.00	0.00
			Max. Compression	14	-228.47	0.00	0.00
			Max. Mx	34	-11.70	-0.16	0.00
			Max. Vy	34	78.30	0.00	0.00
T5	75 - 66.6667	Leg	Max Tension	29	145578.68	-0.63	-0.10
			Max. Compression	12	-169266.82	0.99	0.10
			Max. Mx	12	-169266.82	0.99	0.10
			Max. My	4	-9316.43	-0.02	-0.83
			Max. Vy	28	-951.35	-0.63	-0.10
			Max. Vx	2	-1233.57	-0.35	-0.81
		Diagonal	Max Tension	33	24732.69	0.00	0.00
			Max. Compression	32	-25141.78	0.00	0.00
			Max. Mx	34	-590.48	0.50	0.00
			Max. My	34	-668.97	0.00	-0.02
			Max. Vy	34	-164.24	0.00	0.00
			Max. Vx	34	5.21	0.00	0.00
		Horizontal	Max Tension	32	18177.55	0.00	0.00
			Max. Compression	33	-18001.91	0.00	0.00
			Max. Mx	38	-426.37	0.31	0.01
			Max. My	12	3118.54	0.06	-0.04
			Max. Vy	38	165.03	0.31	0.01
			Max. Vx	12	-5.53	0.06	-0.04
		Inner Bracing	Max Tension	13	6.52	0.00	0.00
			Max. Compression	43	-15.91	0.00	0.00
			Max. Mx	34	-12.50	-0.17	0.00
			Max. Vy	34	81.73	0.00	0.00
T6	66.6667 - 58.3333	Leg	Max Tension	29	170961.17	-0.89	-0.10
			Max. Compression	12	-197898.16	-0.80	0.17
			Max. Mx	12	-197493.53	0.99	0.10
			Max. My	4	-11131.51	-0.14	-1.65
			Max. Vy	2	387.33	0.98	-0.15
			Max. Vx	2	412.34	0.19	-1.57
		Diagonal	Max Tension	33	25775.27	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. Compression	32	-26204.49	0.00	0.00
			Max. Mx	34	-769.29	0.53	0.00
			Max. My	34	-716.57	0.00	-0.02
			Max. Vy	34	170.53	0.00	0.00
			Max. Vx	34	-5.32	0.00	0.00
		Top Girt	Max Tension	32	19320.08	0.00	0.00
			Max. Compression	33	-19052.74	0.00	0.00
			Max. Mx	38	466.81	0.34	0.01
			Max. My	12	-875.40	0.06	-0.04
			Max. Vy	38	171.51	0.34	0.01
			Max. Vx	12	5.29	0.06	-0.04
		Inner Bracing	Max Tension	33	328.78	0.00	0.00
			Max. Compression	32	-336.17	0.00	0.00
			Max. Mx	34	-12.87	-0.19	0.00
			Max. Vy	34	85.00	0.00	0.00
T7	58.3333 - 50	Leg	Max Tension	29	196246.44	0.55	-0.16
			Max. Compression	12	-226223.03	0.02	0.22
			Max. Mx	12	-226124.31	2.72	-0.15
			Max. My	4	-11844.72	-0.14	-1.65
			Max. Vy	12	-913.72	2.72	-0.15
			Max. Vx	4	-745.95	-0.14	-1.65
		Diagonal	Max Tension	33	26728.09	0.00	0.00
			Max. Compression	32	-27308.17	0.00	0.00
			Max. Mx	30	14032.56	-0.26	0.01
			Max. My	38	-1031.59	-0.01	-0.03
			Max. Vy	37	119.22	-0.17	-0.03
			Max. Vx	40	6.89	0.00	0.00
		Top Girt	Max Tension	32	20249.95	0.00	0.00
			Max. Compression	33	-20144.93	0.00	0.00
			Max. Mx	38	-527.16	0.39	0.00
			Max. My	12	2983.44	0.04	-0.04
			Max. Vy	38	-182.09	0.39	0.00
			Max. Vx	46	5.50	0.32	-0.02
		Redund Horz 1 Bracing	Max Tension	12	3922.49	0.00	0.00
			Max. Compression	12	-3922.49	0.00	0.00
			Max. Mx	34	904.20	-0.05	0.00
			Max. My	34	689.65	0.00	0.00
			Max. Vy	34	45.15	0.00	0.00
			Max. Vx	34	-1.04	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	12	2598.54	0.00	0.00
			Max. Compression	12	-2598.54	0.00	0.00
			Max. Mx	34	599.00	-0.07	0.00
			Max. My	34	456.87	0.00	-0.00
			Max. Vy	34	43.50	0.00	0.00
			Max. Vx	34	1.38	0.00	0.00
		Inner Bracing	Max Tension	17	345.84	0.00	0.00
			Max. Compression	16	-354.69	0.00	0.00
			Max. Mx	34	-5.01	-0.20	0.00
			Max. Vy	34	88.65	0.00	0.00
T8	50 - 37.5	Leg	Max Tension	29	223483.36	-0.17	-0.21
			Max. Compression	12	-256852.96	-0.85	0.35
			Max. Mx	12	-256852.96	-1.27	0.35
			Max. My	4	-13352.28	-0.18	-2.53
			Max. Vy	25	330.13	0.06	0.07
			Max. Vx	2	505.51	0.15	-2.48
		Diagonal	Max Tension	33	34418.55	0.00	0.00
			Max. Compression	32	-34934.53	0.00	0.00
			Max. Mx	34	-602.89	0.91	0.00
			Max. My	34	-780.86	0.00	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	34	-227.54	0.00	0.00
			Max. Vx	34	8.41	0.00	0.00
		Top Girt	Max Tension	32	21760.82	0.00	0.00
			Max. Compression	33	-21419.91	0.00	0.00
			Max. Mx	38	488.13	0.45	0.02
			Max. My	12	-845.99	-0.03	-0.07
			Max. Vy	38	194.27	0.45	0.02
			Max. Vx	12	-8.36	-0.03	-0.07
		Inner Bracing	Max Tension	33	369.16	0.00	0.00
			Max. Compression	32	-379.16	0.00	0.00
			Max. Mx	34	-17.26	-0.23	0.00
			Max. Vy	34	97.53	0.00	0.00
T9	37.5 - 25	Leg	Max Tension	29	261461.82	0.55	-0.33
			Max. Compression	12	-299541.54	-2.92	0.42
			Max. Mx	12	-299368.78	7.04	-0.30
			Max. My	4	-14925.65	-0.33	-3.19
			Max. Vy	12	1725.77	7.04	-0.30
			Max. Vx	2	1017.65	0.96	-3.10
		Diagonal	Max Tension	33	36609.32	-0.29	-0.01
			Max. Compression	32	-37328.57	0.00	0.00
			Max. Mx	30	18594.74	-0.45	0.02
			Max. My	35	-1160.90	-0.23	0.05
			Max. Vy	37	-151.25	-0.29	-0.05
			Max. Vx	48	9.76	0.00	0.00
		Top Girt	Max Tension	32	23374.91	0.00	0.00
			Max. Compression	33	-23278.24	0.00	0.00
			Max. Mx	38	-608.61	0.54	0.01
			Max. My	12	3598.77	-0.03	-0.07
			Max. Vy	38	-217.82	0.54	0.01
			Max. Vx	12	-8.53	-0.03	-0.07
		Redund Horz 1 Bracing	Max Tension	12	5194.45	0.00	0.00
			Max. Compression	12	-5194.45	0.00	0.00
			Max. Mx	34	1043.04	-0.06	0.00
			Max. My	34	824.93	0.00	0.00
			Max. Vy	34	48.71	0.00	0.00
			Max. Vx	34	-1.12	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	12	4078.42	0.00	0.00
			Max. Compression	12	-4078.42	0.00	0.00
			Max. Mx	34	846.85	-0.09	0.00
			Max. My	34	647.69	0.00	-0.00
			Max. Vy	34	46.27	0.00	0.00
			Max. Vx	34	-1.77	0.00	0.00
		Inner Bracing	Max Tension	33	398.94	0.00	0.00
			Max. Compression	32	-410.25	0.00	0.00
			Max. Mx	34	-6.08	-0.26	0.00
			Max. Vy	34	-102.27	0.00	0.00
T10	25 - 0	Leg	Max Tension	29	346016.67	-3.35	-0.27
			Max. Compression	12	-395615.40	0.00	0.00
			Max. Mx	12	-348233.71	3.63	0.29
			Max. My	4	-15906.33	-0.33	-3.19
			Max. Vy	2	-855.83	3.62	-0.43
			Max. Vx	2	-677.97	-1.78	-2.29
		Diagonal	Max Tension	33	39832.63	0.00	0.00
			Max. Compression	32	-40580.61	0.00	0.00
			Max. Mx	34	-1071.45	1.17	0.00
			Max. My	34	-451.30	0.00	0.04
			Max. Vy	34	-275.78	0.00	0.00
			Max. Vx	34	-9.41	0.00	0.00
		Horizontal	Max Tension	32	27327.22	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. Compression	33	-26933.69	0.00	0.00
			Max. Mx	38	-154.56	0.68	0.01
			Max. My	12	4133.59	0.07	-0.08
			Max. Vy	38	-263.22	0.68	0.01
			Max. Vx	12	8.98	0.06	-0.07
		Inner Bracing	Max Tension	13	9.61	0.00	0.00
			Max. Compression	43	-25.78	0.00	0.00
			Max. Mx	34	-20.50	-0.29	0.00
			Max. Vy	34	-105.98	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	439245.78	50930.73	-28918.32
	Max. H_x	24	439245.78	50930.73	-28918.32
	Max. H_z	7	-375383.41	-43703.19	27931.13
	Min. Vert	9	-387019.35	-46365.97	26348.70
	Min. H_x	9	-387019.35	-46365.97	26348.70
	Min. H_z	22	408996.65	45710.17	-29077.47
Leg B	Max. Vert	12	443538.82	-49677.99	-31685.59
	Max. H_x	29	-388871.15	45202.42	28907.99
	Max. H_z	33	-339172.41	35770.60	31977.73
	Min. Vert	29	-388871.15	45202.42	28907.99
	Min. H_x	12	443538.82	-49677.99	-31685.59
	Min. H_z	16	375226.89	-37793.03	-33150.83
Leg A	Max. Vert	2	441191.92	3022.89	58738.66
	Max. H_x	26	21301.29	14715.31	1489.04
	Max. H_z	2	441191.92	3022.89	58738.66
	Min. Vert	19	-388229.54	-2798.19	-53492.48
	Min. H_x	13	-197509.85	-14779.14	-27854.31
	Min. H_z	19	-388229.54	-2798.19	-53492.48

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	49531.86	-0.00	-0.00	3.06	-13.37	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	59438.23	-288.34	-107250.52	-8393.28	17.29	118.93
0.9 Dead+1.6 Wind 0 deg - No Ice	44578.67	-288.34	-107250.52	-8394.20	21.30	118.93
1.2 Dead+1.6 Wind 30 deg - No Ice	59438.23	51264.08	-89137.86	-7010.83	-4045.61	73.58
0.9 Dead+1.6 Wind 30 deg - No Ice	44578.67	51264.08	-89137.86	-7011.75	-4041.60	73.58
1.2 Dead+1.6 Wind 45 deg - No Ice	59438.23	72157.76	-72204.73	-5680.91	-5699.19	45.23
0.9 Dead+1.6 Wind 45 deg - No Ice	44578.67	72157.76	-72204.73	-5681.83	-5695.18	45.23
1.2 Dead+1.6 Wind 60 deg - No	59438.23	87880.45	-50604.54	-3980.56	-6948.52	14.30

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
Ice 0.9 Dead+1.6 Wind 60 deg - No Ice	44578.67	87880.45	-50604.54	-3981.48	-6944.50	14.30
1.2 Dead+1.6 Wind 90 deg - No Ice	59438.23	103027.57	288.34	37.01	-8132.90	-48.01
0.9 Dead+1.6 Wind 90 deg - No Ice	44578.67	103027.57	288.34	36.09	-8128.89	-48.01
1.2 Dead+1.6 Wind 120 deg - No Ice	59438.23	92968.32	53874.97	4231.02	-7302.92	-102.79
0.9 Dead+1.6 Wind 120 deg - No Ice	44578.67	92968.32	53874.97	4230.10	-7298.91	-102.79
1.2 Dead+1.6 Wind 135 deg - No Ice	59438.23	72565.53	72612.50	5735.40	-5746.32	-118.30
0.9 Dead+1.6 Wind 135 deg - No Ice	44578.67	72565.53	72612.50	5734.48	-5742.31	-118.30
1.2 Dead+1.6 Wind 150 deg - No Ice	59438.23	51763.49	89426.19	7051.51	-4103.33	-121.59
0.9 Dead+1.6 Wind 150 deg - No Ice	44578.67	51763.49	89426.19	7050.59	-4099.32	-121.59
1.2 Dead+1.6 Wind 180 deg - No Ice	59438.23	288.34	101708.50	8029.88	-49.37	-110.60
0.9 Dead+1.6 Wind 180 deg - No Ice	44578.67	288.34	101708.50	8028.96	-45.36	-110.60
1.2 Dead+1.6 Wind 210 deg - No Ice	59438.23	-51264.08	89137.86	7018.18	4013.52	-73.58
0.9 Dead+1.6 Wind 210 deg - No Ice	44578.67	-51264.08	89137.86	7017.26	4017.54	-73.58
1.2 Dead+1.6 Wind 225 deg - No Ice	59438.23	-72157.76	72204.73	5688.27	5667.11	-45.23
0.9 Dead+1.6 Wind 225 deg - No Ice	44578.67	-72157.76	72204.73	5687.35	5671.12	-45.23
1.2 Dead+1.6 Wind 240 deg - No Ice	59438.23	-92679.98	53375.55	4173.29	7237.51	-16.14
0.9 Dead+1.6 Wind 240 deg - No Ice	44578.67	-92679.98	53375.55	4172.37	7241.52	-16.14
1.2 Dead+1.6 Wind 270 deg - No Ice	59438.23	-103027.57	-288.34	-29.65	8100.82	48.01
0.9 Dead+1.6 Wind 270 deg - No Ice	44578.67	-103027.57	-288.34	-30.57	8104.83	48.01
1.2 Dead+1.6 Wind 300 deg - No Ice	59438.23	-88168.78	-51103.95	-4038.29	6949.76	96.30
0.9 Dead+1.6 Wind 300 deg - No Ice	44578.67	-88168.78	-51103.95	-4039.21	6953.77	96.30
1.2 Dead+1.6 Wind 315 deg - No Ice	59438.23	-72565.53	-72612.50	-5728.04	5714.24	118.30
0.9 Dead+1.6 Wind 315 deg - No Ice	44578.67	-72565.53	-72612.50	-5728.96	5718.25	118.30
1.2 Dead+1.6 Wind 330 deg - No Ice	59438.23	-51763.49	-89426.19	-7044.15	4071.25	121.59
0.9 Dead+1.6 Wind 330 deg - No Ice	44578.67	-51763.49	-89426.19	-7045.07	4075.26	121.59
1.2 Dead+1.0 Ice	217911.13	0.00	-0.00	-120.38	-177.89	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	217911.13	-38.91	-39373.50	-3245.24	-173.72	28.37
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	217911.13	19373.24	-33607.56	-2793.81	-1718.96	10.52
1.2 Dead+1.0 Wind 45 deg+1.0 Ice	217911.13	27353.89	-27364.67	-2297.81	-2355.28	0.48
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	217911.13	33437.21	-19290.14	-1655.57	-2841.05	-9.53
1.2 Dead+1.0 Wind 90 deg+1.0	217911.13	38813.89	38.91	-116.21	-3267.26	-27.10

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
Ice						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	217911.13	34104.70	19720.45	1445.66	-2886.14	-38.08
1.2 Dead+1.0 Wind 135 deg+1.0 Ice	217911.13	27408.92	27419.70	2062.94	-2361.17	-39.42
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	217911.13	19440.64	33646.47	2557.22	-1726.18	-37.61
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	217911.13	38.91	38647.68	2957.23	-182.05	-27.59
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	217911.13	-19373.24	33607.56	2553.05	1363.19	-10.52
1.2 Dead+1.0 Wind 225 deg+1.0 Ice	217911.13	-27353.89	27364.67	2057.05	1999.51	-0.48
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	217911.13	-34065.79	19653.05	1438.44	2526.20	9.71
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	217911.13	-38813.89	-38.91	-124.55	2911.49	27.10
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	217911.13	-33476.12	-19357.54	-1662.79	2489.44	37.12
1.2 Dead+1.0 Wind 315 deg+1.0 Ice	217911.13	-27408.92	-27419.70	-2303.70	2005.40	39.42
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	217911.13	-19440.64	-33646.47	-2797.98	1370.41	37.61
Dead+Wind 0 deg - Service	49531.86	-65.23	-24261.53	-1896.44	-5.83	26.90
Dead+Wind 30 deg - Service	49531.86	11596.63	-20164.20	-1583.71	-924.91	16.64
Dead+Wind 45 deg - Service	49531.86	16323.07	-16333.70	-1282.87	-1298.97	10.23
Dead+Wind 60 deg - Service	49531.86	19879.76	-11447.44	-898.22	-1581.59	3.23
Dead+Wind 90 deg - Service	49531.86	23306.24	65.23	10.60	-1849.51	-10.86
Dead+Wind 120 deg - Service	49531.86	21030.70	12187.25	959.35	-1661.76	-23.25
Dead+Wind 135 deg - Service	49531.86	16415.31	16425.94	1299.66	-1309.64	-26.76
Dead+Wind 150 deg - Service	49531.86	11709.61	20229.42	1597.38	-937.97	-27.51
Dead+Wind 180 deg - Service	49531.86	65.23	23007.85	1818.70	-20.91	-25.02
Dead+Wind 210 deg - Service	49531.86	-11596.63	20164.20	1589.84	898.17	-16.64
Dead+Wind 225 deg - Service	49531.86	-16323.07	16333.70	1289.00	1272.24	-10.23
Dead+Wind 240 deg - Service	49531.86	-20965.48	12074.28	946.29	1627.48	-3.65
Dead+Wind 270 deg - Service	49531.86	-23306.24	-65.23	-4.47	1822.78	10.86
Dead+Wind 300 deg - Service	49531.86	-19944.98	-11560.41	-911.28	1562.39	21.78
Dead+Wind 315 deg - Service	49531.86	-16415.31	-16425.94	-1293.53	1282.90	26.76
Dead+Wind 330 deg - Service	49531.86	-11709.61	-20229.42	-1591.25	911.23	27.51

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-49531.86	0.00	0.00	49531.86	0.00	0.000%
2	-288.34	-59438.23	-107250.52	288.34	59438.23	107250.52	0.000%
3	-288.34	-44578.67	-107250.52	288.34	44578.67	107250.52	0.000%
4	51264.08	-59438.23	-89137.86	-51264.08	59438.23	89137.86	0.000%
5	51264.08	-44578.67	-89137.86	-51264.08	44578.67	89137.86	0.000%
6	72157.76	-59438.23	-72204.73	-72157.76	59438.23	72204.73	0.000%
7	72157.76	-44578.67	-72204.73	-72157.76	44578.67	72204.73	0.000%
8	87880.45	-59438.23	-50604.54	-87880.45	59438.23	50604.54	0.000%
9	87880.45	-44578.67	-50604.54	-87880.45	44578.67	50604.54	0.000%
10	103027.57	-59438.23	288.34	-103027.57	59438.23	-288.34	0.000%
11	103027.57	-44578.67	288.34	-103027.57	44578.67	-288.34	0.000%
12	92968.32	-59438.23	53874.97	-92968.32	59438.23	-53874.97	0.000%
13	92968.32	-44578.67	53874.97	-92968.32	44578.67	-53874.97	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
14	72565.53	-59438.23	72612.50	-72565.53	59438.23	-72612.50	0.000%
15	72565.53	-44578.67	72612.50	-72565.53	44578.67	-72612.50	0.000%
16	51763.49	-59438.23	89426.19	-51763.49	59438.23	-89426.19	0.000%
17	51763.49	-44578.67	89426.19	-51763.49	44578.67	-89426.19	0.000%
18	288.34	-59438.23	101708.50	-288.34	59438.23	-101708.50	0.000%
19	288.34	-44578.67	101708.50	-288.34	44578.67	-101708.50	0.000%
20	-51264.08	-59438.23	89137.86	51264.08	59438.23	-89137.86	0.000%
21	-51264.08	-44578.67	89137.86	51264.08	44578.67	-89137.86	0.000%
22	-72157.76	-59438.23	72204.73	72157.76	59438.23	-72204.73	0.000%
23	-72157.76	-44578.67	72204.73	72157.76	44578.67	-72204.73	0.000%
24	-92679.98	-59438.23	53375.55	92679.98	59438.23	-53375.55	0.000%
25	-92679.98	-44578.67	53375.55	92679.98	44578.67	-53375.55	0.000%
26	-103027.57	-59438.23	-288.34	103027.57	59438.23	288.34	0.000%
27	-103027.57	-44578.67	-288.34	103027.57	44578.67	288.34	0.000%
28	-88168.78	-59438.23	-51103.95	88168.78	59438.23	51103.95	0.000%
29	-88168.78	-44578.67	-51103.95	88168.78	44578.67	51103.95	0.000%
30	-72565.53	-59438.23	-72612.50	72565.53	59438.23	72612.50	0.000%
31	-72565.53	-44578.67	-72612.50	72565.53	44578.67	72612.50	0.000%
32	-51763.49	-59438.23	-89426.19	51763.49	59438.23	89426.19	0.000%
33	-51763.49	-44578.67	-89426.19	51763.49	44578.67	89426.19	0.000%
34	0.00	-217911.13	0.00	-0.00	217911.13	0.00	0.000%
35	-38.91	-217911.13	-39373.50	38.91	217911.13	39373.50	0.000%
36	19373.24	-217911.13	-33607.56	-19373.24	217911.13	33607.56	0.000%
37	27353.89	-217911.13	-27364.67	-27353.89	217911.13	27364.67	0.000%
38	33437.21	-217911.13	-19290.14	-33437.21	217911.13	19290.14	0.000%
39	38813.89	-217911.13	38.91	-38813.89	217911.13	-38.91	0.000%
40	34104.70	-217911.13	19720.45	-34104.70	217911.13	-19720.45	0.000%
41	27408.92	-217911.13	27419.70	-27408.92	217911.13	-27419.70	0.000%
42	19440.64	-217911.13	33646.47	-19440.64	217911.13	-33646.47	0.000%
43	38.91	-217911.13	38647.68	-38.91	217911.13	-38647.68	0.000%
44	-19373.24	-217911.13	33607.56	19373.24	217911.13	-33607.56	0.000%
45	-27353.89	-217911.13	27364.67	27353.89	217911.13	-27364.67	0.000%
46	-34065.79	-217911.13	19653.05	34065.79	217911.13	-19653.05	0.000%
47	-38813.89	-217911.13	-38.91	38813.89	217911.13	38.91	0.000%
48	-33476.12	-217911.13	-19357.54	33476.12	217911.13	19357.54	0.000%
49	-27408.92	-217911.13	-27419.70	27408.92	217911.13	27419.70	0.000%
50	-19440.64	-217911.13	-33646.47	19440.64	217911.13	33646.47	0.000%
51	-65.23	-49531.86	-24261.53	65.23	49531.86	24261.53	0.000%
52	11596.63	-49531.86	-20164.20	-11596.63	49531.86	20164.20	0.000%
53	16323.07	-49531.86	-16333.70	-16323.07	49531.86	16333.70	0.000%
54	19879.76	-49531.86	-11447.44	-19879.76	49531.86	11447.44	0.000%
55	23306.24	-49531.86	65.23	-23306.24	49531.86	-65.23	0.000%
56	21030.70	-49531.86	12187.25	-21030.70	49531.86	-12187.25	0.000%
57	16415.31	-49531.86	16425.94	-16415.31	49531.86	-16425.94	0.000%
58	11709.61	-49531.86	20229.42	-11709.61	49531.86	-20229.42	0.000%
59	65.23	-49531.86	23007.85	-65.23	49531.86	-23007.85	0.000%
60	-11596.63	-49531.86	20164.20	11596.63	49531.86	-20164.20	0.000%
61	-16323.07	-49531.86	16333.70	16323.07	49531.86	-16333.70	0.000%
62	-20965.48	-49531.86	12074.28	20965.48	49531.86	-12074.28	0.000%
63	-23306.24	-49531.86	-65.23	23306.24	49531.86	65.23	0.000%
64	-19944.98	-49531.86	-11560.41	19944.98	49531.86	11560.41	0.000%
65	-16415.31	-49531.86	-16425.94	16415.31	49531.86	16425.94	0.000%
66	-11709.61	-49531.86	-20229.42	11709.61	49531.86	20229.42	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 150	2.694	56	0.1195	0.0273
T2	150 - 125	2.441	56	0.1196	0.0266
T3	125 - 100	1.793	56	0.1165	0.0223
T4	100 - 75	1.208	56	0.0991	0.0188
T5	75 - 66.6667	0.695	56	0.0819	0.0145
T6	66.6667 - 58.3333	0.548	56	0.0753	0.0129
T7	58.3333 - 50	0.412	56	0.0677	0.0112
T8	50 - 37.5	0.300	56	0.0550	0.0096
T9	37.5 - 25	0.169	56	0.0401	0.0070
T10	25 - 0	0.079	56	0.0236	0.0044

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 2"x21'	56	2.694	0.1195	0.0273	210057
159.00	SC479-HF1LDF	56	2.669	0.1195	0.0272	210057
158.00	TMA 432-83H-01T	56	2.644	0.1195	0.0272	210057
157.50	SC479-HF1LDF(D00I-E6085)	56	2.631	0.1195	0.0271	210057
157.00	SC479-HF1LDF	56	2.619	0.1195	0.0271	210057
155.00	DB304-A	56	2.569	0.1195	0.0270	210057
150.00	SC479-HF1LDF(D00I-E6085) (Inverted)	56	2.441	0.1196	0.0266	125540
145.00	DC6-48-60-18-8F (Squid) Suppressor	56	2.312	0.1197	0.0260	202099
141.25	SC479-HF1LDF	56	2.214	0.1196	0.0254	658661
141.00	SC479-HF1LDF	56	2.207	0.1196	0.0253	775446
140.00	HPD2-4.7	56	2.181	0.1196	0.0251	Inf
139.50	SC479-HF1LDF	56	2.168	0.1196	0.0251	Inf
120.00	PD1142-1	56	1.669	0.1139	0.0216	83012
119.00	RR90-17-02DP	56	1.645	0.1133	0.0214	84840
108.00	8' Stiff-Arm	56	1.387	0.1053	0.0199	111393
107.50	4"x96"x72" Ice Canopy	56	1.376	0.1049	0.0199	112975
107.00	6' w/ Radome	56	1.364	0.1045	0.0198	114602
106.50	6' w/ Radome	56	1.353	0.1041	0.0197	116276
97.00	APXVSPP18-C-A20	56	1.142	0.0970	0.0184	121962
82.00	16x16 Panel 19dBi 2.45GHz ISM	56	0.829	0.0870	0.0158	69893
75.00	SBNHH-1D65B	56	0.695	0.0819	0.0145	61907

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 150	11.876	12	0.5281	0.1205
T2	150 - 125	10.760	12	0.5282	0.1176
T3	125 - 100	7.898	12	0.5139	0.0988
T4	100 - 75	5.318	12	0.4365	0.0832
T5	75 - 66.6667	3.061	12	0.3604	0.0640
T6	66.6667 - 58.3333	2.412	12	0.3311	0.0570
T7	58.3333 - 50	1.817	12	0.2978	0.0496

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	50 - 37.5	1.321	12	0.2417	0.0423
T9	37.5 - 25	0.745	12	0.1765	0.0310
T10	25 - 0	0.350	12	0.1038	0.0193

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 2"x21'	12	11.876	0.5281	0.1205	48545
159.00	SC479-HF1LDF	12	11.765	0.5281	0.1203	48545
158.00	TMA 432-83H-01T	12	11.655	0.5281	0.1201	48545
157.50	SC479-HF1LDF(D00I-E6085)	12	11.599	0.5281	0.1200	48545
157.00	SC479-HF1LDF	12	11.544	0.5281	0.1198	48545
155.00	DB304-A	12	11.321	0.5281	0.1193	48545
150.00	SC479-HF1LDF(D00I-E6085) (Inverted)	12	10.760	0.5282	0.1176	29050
145.00	DC6-48-60-18-8F (Squid) Suppressor	12	10.188	0.5284	0.1148	47285
141.25	SC479-HF1LDF	12	9.755	0.5282	0.1121	163650
141.00	SC479-HF1LDF	12	9.726	0.5282	0.1119	195768
140.00	HPD2-4.7	12	9.610	0.5280	0.1112	298073
139.50	SC479-HF1LDF	12	9.552	0.5279	0.1108	264420
120.00	PD1142-1	12	7.353	0.5023	0.0953	18718
119.00	RR90-17-02DP	12	7.246	0.4995	0.0946	19121
108.00	8' Stiff-Arm	12	6.108	0.4639	0.0881	25063
107.50	4"x96"x72" Ice Canopy	12	6.058	0.4622	0.0878	25422
107.00	6' w/ Radome	12	6.008	0.4604	0.0875	25792
106.50	6' w/ Radome	12	5.958	0.4587	0.0872	26172
97.00	APXVSPP18-C-A20	12	5.028	0.4270	0.0813	27466
82.00	16x16 Panel 19dBi 2.45GHz ISM	12	3.650	0.3827	0.0699	15842
75.00	SBNHH-1D65B	12	3.061	0.3604	0.0640	14070

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325X	0.7500	6	225.18	29820.60	0.008 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	2406.32	17943.80	0.134 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	977.20	10263.30	0.095 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	2	464.09	10263.30	0.045 ✔	1	Member Block Shear
T2	150	Leg	A325X	0.7500	6	2710.82	29820.60	0.091 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	10718.60	17943.80	0.597 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	3360.26	7187.70	0.468 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T3	125	Leg	A325X	0.7500	6	9826.56	29820.60	0.330 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	15749.40	29906.30	0.527 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	5360.61	12829.10	0.418 ✔	1	Member Block Shear
T4	100	Leg	A325X	0.7500	6	20285.70	29820.60	0.680 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	22093.80	25230.00	0.876 ✔	1	Member Bearing
		Horizontal	A325X	0.6250	2	7979.78	15186.40	0.525 ✔	1	Bolt Shear
T5	75	Leg	A325X	0.8750	6	24263.10	40589.10	0.598 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	25141.80	35784.70	0.703 ✔	1	Bolt Shear
		Horizontal	A325X	0.6250	2	9088.77	15186.40	0.598 ✔	1	Bolt Shear
T6	66.6667	Leg	A325X	0.8750	6	28493.50	40589.10	0.702 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	26204.50	35784.70	0.732 ✔	1	Bolt Shear
		Top Girt	A325X	0.6250	2	9660.04	15186.40	0.636 ✔	1	Bolt Shear
T7	58.3333	Leg	A325X	0.8750	6	32677.80	40589.10	0.805 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	26728.10	31537.50	0.848 ✔	1	Member Bearing
		Top Girt	A325X	0.6250	2	10125.00	15186.40	0.667 ✔	1	Bolt Shear
T8	50	Leg	A325X	1.0000	8	27935.40	53014.40	0.527 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	34418.60	48810.90	0.705 ✔	1	Member Block Shear
T9	37.5	Leg	A325X	1.0000	8	32640.60	53014.40	0.616 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	36609.30	45703.10	0.801 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	2	11687.50	15186.40	0.770 ✔	1	Bolt Shear
T10	25	Leg	A325X	1.0000	8	43252.10	53014.40	0.816 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	39832.60	54843.80	0.726 ✔	1	Member Block Shear
		Horizontal	A325X	0.6250	2	13663.60	15186.40	0.900 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	160 - 150	P.5x.250	10.01	5.01	35.7 K=1.00	3.7306	-4053.30	152929.00	0.027 [1] ✔
T2	150 - 125	P.5x.250	25.03	8.34	59.5 K=1.00	3.7306	-22651.00	129561.00	0.175 [1] ✔
T3	125 - 100	P.5x.250	25.03	8.34	59.5 K=1.00	3.7306	-70679.80	129561.00	0.546 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 75	P5x0.3 w/ (3) 1.5x5/8 Plates	25.03	8.34	51.4 K=1.00	7.2544	-142193.00	269039.00	0.529 [1] ✔
T5	75 - 66.6667	P5x0.4 w/ (3) 1.5x5/8 Plates	8.34	8.34	53.2 K=1.00	8.6530	-169267.00	316528.00	0.535 [1] ✔
T6	66.6667 - 58.3333	P5x0.4 w/ (3) 1.5x5/8 Plates	8.34	8.34	53.2 K=1.00	8.6530	-197898.00	316528.00	0.625 [1] ✔
T7	58.3333 - 50	HSS5x.4	8.34	4.17	30.7 K=1.00	5.7805	-226223.00	287435.00	0.787 [1] ✔
T8	50 - 37.5	HSS6.875x.4	12.51	12.51	65.5 K=1.00	8.1367	-256853.00	301661.00	0.851 [1] ✔
T9	37.5 - 25	HSS6.875x.4	12.51	6.26	32.7 K=1.00	8.1367	-299542.00	399956.00	0.749 [1] ✔
T10	25 - 0	HSS6.875x0.5 w/ (3) 2x5/8 Bars	25.03	12.51	58.7 K=1.00	13.1229	-395615.00	459193.00	0.862 [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	160 - 150	2L2 1/2x2x3/16	7.43	6.88	104.5 K=1.00	1.6200	-2525.70	29528.70	0.086 [1] ✔
T2	150 - 125	2L2 1/2x2x3/16	10.57	9.96	151.3 K=1.00	1.6200	-10835.90	15986.60	0.678 [1] ✔
T3	125 - 100	2L2 1/2x2 1/2x5/16	11.21	10.63	167.6 K=1.00	2.9300	-16028.10	23555.00	0.680 [1] ✔
T4	100 - 75	2L3x2 1/2x1/4	11.91	11.21	142.4 K=1.00	2.6300	-22443.80	29311.90	0.766 [1] ✔
T5	75 - 66.6667	2L3x2 1/2x5/16	12.15	11.46	146.8 K=1.00	3.2422	-25141.80	33987.10	0.740 [1] ✔
T6	66.6667 - 58.3333	2L3x2 1/2x5/16	12.39	11.71	150.0 K=1.00	3.2422	-26204.50	32542.60	0.805 [1] ✔
T7	58.3333 - 50	2L3x3x5/16	12.64	12.09	115.1 K=1.00	3.5500	-27308.20	57230.60	0.477 [1] ✔
T8	50 - 37.5	2L3 1/2x3x3/8	16.01	15.22	167.5 K=1.00	4.5900	-34934.50	36939.50	0.946 [1] ✔
T9	37.5 - 25	2L3 1/2x3 1/2x5/16	16.33	15.55	126.9 K=1.00	4.1800	-37328.60	58613.30	0.637 [1] ✔
T10	25 - 0	2L4x3x3/8	16.99	16.06	163.3 K=1.00	4.9700	-40580.60	42115.30	0.964 [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	160 - 150	L3x3x1/4	10.60	5.09	93.5 K=0.91	1.4400	-1954.37	29433.90	0.066 [1] ✔
T2	150 - 125	L2 1/2x2 1/2x3/16	12.33	5.96	106.9 K=0.74	0.9020	-6690.85	16005.30	0.418 [1] ✔
T3	125 - 100	L3x3x5/16	14.33	6.96	106.1 K=0.75	1.7800	-10606.20	31894.50	0.333 [1] ✔
T4	100 - 75	L3x3x1/2	16.33	7.86	112.5 K=0.70	2.7500	-15768.90	45750.70	0.345 [1] ✔
T5	75 - 66.6667	L3x3x1/2	17.00	8.20	114.7 K=0.68	2.7500	-18001.90	44548.30	0.404 [1] ✔
T10	25 - 0	L4x4x1/2	22.00	10.59	112.8 K=0.69	3.7500	-26933.70	62155.00	0.433 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	160 - 150	L3x3x1/4	10.20	4.69	107.6 K=1.13	1.4400	-958.97	25371.20	0.038 [1] ✔
T4	100 - 75	L3x3x1/4	15.00	7.29	141.2 K=0.96	1.4400	-12988.20	16310.60	0.796 [1] ✔
T6	66.6667 - 58.3333	L3x3x1/2	17.67	8.33	159.1 K=0.93	2.7500	-19052.70	24547.70	0.776 [1] ✔
T7	58.3333 - 50	L3x3x1/2	18.33	8.67	164.3 K=0.92	2.7500	-20144.90	23013.00	0.875 [1] ✔
T8	50 - 37.5	L4x4x1/4	19.00	9.29	135.5 K=0.97	1.9400	-21419.90	23877.90	0.897 [1] ✔
T9	37.5 - 25	L4x4x5/16	20.00	9.52	138.6 K=0.96	2.4000	-23278.20	28223.90	0.825 [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 $\frac{P_u}{\phi P_n}$
T7	58.3333 - 50	L2x2x5/16	4.58	4.38	134.6 K=1.00	1.1500	-3922.49	14336.70	0.274 [1] ✔
T9	37.5 - 25	L2x2x5/16	5.00	4.71	145.0 K=1.00	1.1500	-5194.45	12351.20	0.421 [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 $\frac{P_u}{\phi P_n}$
T7	58.3333 - 50	L2x2x5/16	6.07	5.66	174.1 K=1.00	1.1500	-2598.54	8572.07	0.303 [1] ✔
T9	37.5 - 25	L2x2x5/16	7.85	7.38	227.0 K=1.00	1.1500	-4078.42	5040.84	0.809 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T3	125 - 100	L2 1/2x2x3/16	7.17	7.17	201.4 K=1.00	0.8090	-13.31	4505.54	0.003 [1] ✔
T4	100 - 75	L2 1/2x2x3/16	7.50	7.50	210.8 K=1.00	0.8090	-228.47	4113.95	0.056 [1] ✔
T5	75 - 66.6667	L2 1/2x2x3/16	8.50	8.50	238.9 K=1.00	0.8090	-15.91	3202.90	0.005 [1] ✔
T6	66.6667 - 58.3333	L2 1/2x2x3/16	8.83	8.83	248.2 K=1.00	0.8090	-336.17	2965.74	0.113 [1] ✔
T7	58.3333 - 50	L2 1/2x2x3/16 KL/R > 250 (C) - 184	9.17	9.17	257.6 K=1.00	0.8090	-354.70	2753.97	0.129 [1] ✔
T8	50 - 37.5	L2 1/2x2 1/2x3/16	9.50	9.50	230.3 K=1.00	0.9020	-379.16	3841.91	0.099 [1] ✔
T9	37.5 - 25	L2 1/2x2 1/2x3/16	10.00	10.00	242.4 K=1.00	0.9020	-410.25	3467.32	0.118 [1] ✔
T10	25 - 0	L2 1/2x2 1/2x3/16 KL/R > 250 (C) - 242	11.00	11.00	266.7 K=1.00	0.9020	-25.78	2865.56	0.009 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	160 - 150	P.5x.250	10.01	5.01	35.7	3.7306	651.95	167879.00	0.004 [1] ✔
T2	150 - 125	P.5x.250	25.03	8.34	59.5	3.7306	16264.90	167879.00	0.097 [1] ✔
T3	125 - 100	P.5x.250	25.03	8.34	59.5	3.7306	58959.40	167879.00	0.351 [1] ✔
T4	100 - 75	P5x0.3 w/ (3) 1.5x5/8 Plates	25.03	8.34	51.4	7.2544	121714.00	326448.00	0.373 [1] ✔
T5	75 - 66.6667	P5x0.4 w/ (3) 1.5x5/8 Plates	8.34	8.34	53.2	8.6530	145579.00	389385.00	0.374 [1] ✔
T6	66.6667 - 58.3333	P5x0.4 w/ (3) 1.5x5/8 Plates	8.34	8.34	53.2	8.6530	170961.00	389385.00	0.439 [1] ✔
T7	58.3333 - 50	HSS5x.4	8.34	4.17	30.7	5.7805	196246.00	312149.00	0.629 [1] ✔
T8	50 - 37.5	HSS6.875x.4	12.51	12.51	65.5	8.1367	223483.00	439383.00	0.509 [1] ✔
T9	37.5 - 25	HSS6.875x.4	12.51	6.26	32.7	8.1367	261462.00	439383.00	0.595 [1] ✔
T10	25 - 0	HSS6.875x0.5 w/ (3) 2x5/8 Bars	25.03	12.51	58.7	13.1229	346017.00	590531.00	0.586 [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	160 - 150	2L2 1/2x2x3/16	7.43	6.88	108.6	0.9689	2406.32	42147.40	0.057 [1] ✔
T2	150 - 125	2L2 1/2x2x3/16	10.57	9.96	155.4	0.9689	10718.60	42147.40	0.254 [1] ✔
T3	125 - 100	2L2 1/2x2 1/2x5/16	11.21	10.63	171.9	1.7873	15749.40	77749.50	0.203 [1] ✔
T4	100 - 75	2L3x2 1/2x1/4	11.91	11.21	145.8	1.6444	22093.80	71530.30	0.309 [1] ✔
T5	75 - 66.6667	2L3x2 1/2x5/16	12.15	11.46	150.3	2.0215	24732.70	98547.40	0.251 [1] ✔
T6	66.6667 - 58.3333	2L3x2 1/2x5/16	12.39	11.71	153.5	2.0215	25775.30	98547.40	0.262 [1] ✔
T7	58.3333 - 50	2L3x3x5/16	12.64	12.09	117.7	2.2523	26728.10	97977.00	0.273 [1] ✔
T8	50 - 37.5	2L3 1/2x3x3/8	16.01	15.22	171.2	2.8097	34418.60	122221.00	0.282 [1] ✔
T9	37.5 - 25	2L3 1/2x3 1/2x5/16	16.33	15.55	129.6	2.6077	36609.30	127123.00	0.288 [1] ✔
T10	25 - 0	2L4x3x3/8	16.99	16.06	166.7	3.0947	39832.60	150866.00	0.264 [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	160 - 150	L3x3x1/4	10.60	5.09	98.5	0.9394	1954.40	40862.80	0.048 [1] ✔
T2	150 - 125	L2 1/2x2 1/2x3/16	12.33	5.96	137.9	0.5710	6720.51	24839.90	0.271 [1] ✔
T3	125 - 100	L3x3x5/16	14.33	6.96	90.6	1.1592	10721.20	50426.00	0.213 [1] ✔
T4	100 - 75	L3x3x1/2	16.33	7.86	105.1	1.7813	15959.60	77484.40	0.206 [1] ✔
T5	75 - 66.6667	L3x3x1/2	17.00	8.20	109.6	1.7813	18177.50	77484.40	0.235 [1] ✔
T10	25 - 0	L4x4x1/2	22.00	10.59	104.2	2.5313	27327.20	110109.00	0.248 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	160 - 150	L3x3x1/4	10.20	4.69	94.7	0.9394	928.18	40862.80	0.023 [1] ✔
T4	100 - 75	L3x3x1/4	15.00	7.29	94.1	1.4400	13097.40	46656.00	0.281 [1] ✔
T6	66.6667 - 58.3333	L3x3x1/2	17.67	8.33	114.0	1.7813	19320.10	77484.40	0.249 [1] ✔
T7	58.3333 - 50	L3x3x1/2	18.33	8.67	118.5	1.7813	20249.90	77484.40	0.261 [1] ✔
T8	50 - 37.5	L4x4x1/4	19.00	9.29	89.2	1.9400	21760.80	62856.00	0.346 [1] ✔
T9	37.5 - 25	L4x4x5/16	20.00	9.52	94.0	1.6242	23374.90	79180.70	0.295 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	58.3333 - 50	L2x2x5/16	4.58	4.38	87.4	1.1500	3922.49	37260.00	0.105 [1] ✔
T9	37.5 - 25	L2x2x5/16	5.00	4.71	94.1	1.1500	5194.45	37260.00	0.139 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T7	58.3333 - 50	L2x2x5/16	6.07	5.66	113.0	1.1500	2598.54	37260.00	0.070 [1] ✔
T9	37.5 - 25	L2x2x5/16	7.85	7.38	147.3	1.1500	4078.42	37260.00	0.109 [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 $\frac{P_u}{\phi P_n}$
T3	125 - 100	L2 1/2x2x3/16	7.17	7.17	143.4	0.8090	6.59	26211.60	0.000 [1] ✔
T4	100 - 75	L2 1/2x2x3/16	7.50	7.50	150.1	0.8090	223.75	26211.60	0.009 [1] ✔
T5	75 - 66.6667	L2 1/2x2x3/16	8.50	8.50	170.1	0.8090	6.52	26211.60	0.000 [1] ✔
T6	66.6667 - 58.3333	L2 1/2x2x3/16	8.83	8.83	176.7	0.8090	328.78	26211.60	0.013 [1] ✔
T7	58.3333 - 50	L2 1/2x2x3/16	9.17	9.17	183.4	0.8090	345.84	26211.60	0.013 [1] ✔
T8	50 - 37.5	L2 1/2x2 1/2x3/16	9.50	9.50	146.5	0.9020	369.16	29224.80	0.013 [1] ✔
T9	37.5 - 25	L2 1/2x2 1/2x3/16	10.00	10.00	154.2	0.9020	398.94	29224.80	0.014 [1] ✔
T10	25 - 0	L2 1/2x2 1/2x3/16	10.50	10.50	162.0	0.9020	9.61	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
T1	160 - 150	Leg	P.5x.250	1	-2141.17	152929.00	1.4	Pass
		Leg	P.5x.250	2	-1803.74	152929.00	1.2	Pass
		Leg	P.5x.250	3	-4053.30	152929.00	2.7	Pass
T2	150 - 125	Leg	P.5x.250	22	-22317.70	129561.00	17.2	Pass
		Leg	P.5x.250	23	-22396.80	129561.00	17.3	Pass
		Leg	P.5x.250	24	-22651.00	129561.00	17.5	Pass
T3	125 - 100	Leg	P.5x.250	52	-70347.00	129561.00	54.3	Pass
		Leg	P.5x.250	53	-70679.80	129561.00	54.6	Pass
		Leg	P.5x.250	54	-70492.50	129561.00	54.4	Pass
T4	100 - 75	Leg	P5x0.3 w/ (3) 1.5x5/8 Plates	91	-140864.00	269039.00	52.4 67.3 (b)	Pass
		Leg	P5x0.3 w/ (3) 1.5x5/8 Plates	92	-142193.00	269039.00	52.9 68.0 (b)	Pass
		Leg	P5x0.3 w/ (3) 1.5x5/8 Plates	93	-141317.00	269039.00	52.5 67.6 (b)	Pass
T5	75 - 66.6667	Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	130	-167433.00	316528.00	52.9 59.2 (b)	Pass
		Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	131	-169267.00	316528.00	53.5 59.8 (b)	Pass
		Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	132	-168203.00	316528.00	53.1 59.5 (b)	Pass
T6	66.6667 - 58.3333	Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	145	-195712.00	316528.00	61.8 69.7 (b)	Pass
		Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	146	-197898.00	316528.00	62.5 70.2 (b)	Pass
		Leg	P5x0.4 w/ (3) 1.5x5/8 Plates	147	-196650.00	316528.00	62.1 69.9 (b)	Pass
T7	58.3333 - 50	Leg	HSS5x.4	160	-223712.00	287435.00	77.8 80.0 (b)	Pass
		Leg	HSS5x.4	161	-226223.00	287435.00	78.7 80.5 (b)	Pass
		Leg	HSS5x.4	162	-224805.00	287435.00	78.2 80.2 (b)	Pass
T8	50 - 37.5	Leg	HSS6.875x.4	187	-253939.00	301661.00	84.2	Pass
		Leg	HSS6.875x.4	188	-256853.00	301661.00	85.1	Pass
		Leg	HSS6.875x.4	189	-255204.00	301661.00	84.6	Pass
T9	37.5 - 25	Leg	HSS6.875x.4	202	-296210.00	399956.00	74.1	Pass
		Leg	HSS6.875x.4	203	-299542.00	399956.00	74.9	Pass
		Leg	HSS6.875x.4	204	-297670.00	399956.00	74.4	Pass
T10	25 - 0	Leg	HSS6.875x0.5 w/ (3) 2x5/8 Bars	229	-391459.00	459193.00	85.2	Pass
		Leg	HSS6.875x0.5 w/ (3) 2x5/8 Bars	230	-395615.00	459193.00	86.2	Pass
		Leg	HSS6.875x0.5 w/ (3) 2x5/8 Bars	231	-393296.00	459193.00	85.6	Pass
T1	160 - 150	Diagonal	2L2 1/2x2x3/16	8	-1439.36	29528.70	4.9 7.5 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	9	-1468.52	29528.70	5.0 7.4 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	11	-2135.98	29528.70	7.2 11.0 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	12	-2097.57	29528.70	7.1 11.2 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	14	-2520.79	29528.70	8.5 13.4 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	15	-2525.70	29528.70	8.6 13.4 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	16	-467.89	30254.00	1.5	Pass
		Diagonal	2L2 1/2x2x3/16	17	-466.21	30254.00	1.5	Pass
		Diagonal	2L2 1/2x2x3/16	18	-1160.43	30254.00	3.8 5.7 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	2L2 1/2x2x3/16	19	-1139.01	30254.00	3.8 5.8 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	20	-1139.63	30254.00	3.8 5.8 (b)	Pass
		Diagonal	2L2 1/2x2x3/16	21	-1157.96	30254.00	3.8 5.7 (b)	Pass
T2	150 - 125	Diagonal	2L2 1/2x2x3/16	26	-8995.12	15986.60	56.3	Pass
		Diagonal	2L2 1/2x2x3/16	27	-9005.51	15986.60	56.3	Pass
		Diagonal	2L2 1/2x2x3/16	29	-10835.90	15986.60	67.8	Pass
		Diagonal	2L2 1/2x2x3/16	30	-10830.70	15986.60	67.7	Pass
		Diagonal	2L2 1/2x2x3/16	32	-10172.10	15986.60	63.6	Pass
		Diagonal	2L2 1/2x2x3/16	33	-10166.90	15986.60	63.6	Pass
		Diagonal	2L2 1/2x2x3/16	35	-7712.54	16654.00	46.3	Pass
		Diagonal	2L2 1/2x2x3/16	36	-7726.57	16654.00	46.4	Pass
		Diagonal	2L2 1/2x2x3/16	38	-9211.58	16654.00	55.3	Pass
		Diagonal	2L2 1/2x2x3/16	39	-9204.66	16654.00	55.3	Pass
		Diagonal	2L2 1/2x2x3/16	41	-8912.52	16654.00	53.5	Pass
		Diagonal	2L2 1/2x2x3/16	42	-8905.41	16654.00	53.5	Pass
		Diagonal	2L2 1/2x2x3/16	44	-1688.35	17339.00	9.7	Pass
		Diagonal	2L2 1/2x2x3/16	45	-1692.13	17339.00	9.8	Pass
		Diagonal	2L2 1/2x2x3/16	47	-3087.96	17339.00	17.8	Pass
		Diagonal	2L2 1/2x2x3/16	48	-2993.44	17339.00	17.3	Pass
		Diagonal	2L2 1/2x2x3/16	50	-3195.24	17339.00	18.4	Pass
		Diagonal	2L2 1/2x2x3/16	51	-3229.77	17339.00	18.6	Pass
T3	125 - 100	Diagonal	2L2 1/2x2 1/2x5/16	56	-13739.70	23555.00	58.3	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	57	-13762.50	23555.00	58.4	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	59	-16028.10	23555.00	68.0	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	60	-16017.00	23555.00	68.0	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	62	-15102.30	23555.00	64.1	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	63	-15090.50	23555.00	64.1	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	68	-11841.20	24561.80	48.2	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	69	-11839.30	24561.80	48.2	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	71	-14110.20	24561.80	57.4	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	72	-14113.50	24561.80	57.5	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	74	-12499.20	24561.80	50.9	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	75	-12497.90	24561.80	50.9	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	80	-9733.10	25605.30	38.0	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	81	-9738.53	25605.30	38.0	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	83	-11863.90	25605.30	46.3	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	84	-11860.70	25605.30	46.3	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	86	-10823.90	25605.30	42.3	Pass
		Diagonal	2L2 1/2x2 1/2x5/16	87	-10821.70	25605.30	42.3	Pass
T4	100 - 75	Diagonal	2L3x2 1/2x1/4	98	-19468.40	29311.90	66.4 75.8 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	99	-19469.60	29311.90	66.4 75.8 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	101	-22441.70	29311.90	76.6 87.6 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	102	-22443.80	29311.90	76.6 87.6 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	104	-20160.20	29311.90	68.8 78.5 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	105	-20156.80	29311.90	68.8 78.5 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	110	-18801.00	30584.10	61.5 73.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	111	-18807.50	30584.10	61.5 73.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	113	-21565.90	30584.10	70.5 84.2 (b)	Pass
		Diagonal	2L3x2 1/2x1/4	114	-21564.10	30584.10	70.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							84.2 (b)	
		Diagonal	2L3x2 1/2x1/4	116	-19792.40	30584.10	64.7	Pass
							77.1 (b)	
		Diagonal	2L3x2 1/2x1/4	117	-19787.70	30584.10	64.7	Pass
							77.1 (b)	
		Diagonal	2L3x2 1/2x1/4	121	-16534.80	31912.00	51.8	Pass
							64.6 (b)	
		Diagonal	2L3x2 1/2x1/4	122	-16551.80	31912.00	51.9	Pass
							64.5 (b)	
		Diagonal	2L3x2 1/2x1/4	123	-19087.40	31912.00	59.8	Pass
							74.6 (b)	
		Diagonal	2L3x2 1/2x1/4	124	-19077.80	31912.00	59.8	Pass
							74.6 (b)	
		Diagonal	2L3x2 1/2x1/4	125	-17876.90	31912.00	56.0	Pass
							69.8 (b)	
		Diagonal	2L3x2 1/2x1/4	126	-17869.50	31912.00	56.0	Pass
							69.8 (b)	
T5	75 - 66.6667	Diagonal	2L3x2 1/2x5/16	134	-21241.10	33987.10	62.5	Pass
		Diagonal	2L3x2 1/2x5/16	135	-21227.10	33987.10	62.5	Pass
		Diagonal	2L3x2 1/2x5/16	137	-25135.50	33987.10	74.0	Pass
		Diagonal	2L3x2 1/2x5/16	138	-25141.80	33987.10	74.0	Pass
		Diagonal	2L3x2 1/2x5/16	140	-21697.00	33987.10	63.8	Pass
		Diagonal	2L3x2 1/2x5/16	141	-21704.70	33987.10	63.9	Pass
T6	66.6667 - 58.3333	Diagonal	2L3x2 1/2x5/16	151	-22134.90	32542.60	68.0	Pass
		Diagonal	2L3x2 1/2x5/16	152	-22116.80	32542.60	68.0	Pass
		Diagonal	2L3x2 1/2x5/16	153	-26194.80	32542.60	80.5	Pass
		Diagonal	2L3x2 1/2x5/16	154	-26204.50	32542.60	80.5	Pass
		Diagonal	2L3x2 1/2x5/16	155	-22391.50	32542.60	68.8	Pass
		Diagonal	2L3x2 1/2x5/16	156	-22400.00	32542.60	68.8	Pass
T7	58.3333 - 50	Diagonal	2L3x3x5/16	166	-23133.60	57230.60	40.4	Pass
							71.4 (b)	
		Diagonal	2L3x3x5/16	169	-23121.30	57230.60	40.4	Pass
							71.5 (b)	
		Diagonal	2L3x3x5/16	172	-27300.40	57230.60	47.7	Pass
							84.8 (b)	
		Diagonal	2L3x3x5/16	175	-27308.20	57230.60	47.7	Pass
							84.7 (b)	
		Diagonal	2L3x3x5/16	178	-23214.30	57230.60	40.6	Pass
							71.7 (b)	
		Diagonal	2L3x3x5/16	181	-23218.70	57230.60	40.6	Pass
							71.7 (b)	
T8	50 - 37.5	Diagonal	2L3 1/2x3x3/8	193	-29400.30	36939.50	79.6	Pass
		Diagonal	2L3 1/2x3x3/8	194	-29366.40	36939.50	79.5	Pass
		Diagonal	2L3 1/2x3x3/8	195	-34913.30	36939.50	94.5	Pass
		Diagonal	2L3 1/2x3x3/8	196	-34934.50	36939.50	94.6	Pass
		Diagonal	2L3 1/2x3x3/8	197	-29248.70	36939.50	79.2	Pass
		Diagonal	2L3 1/2x3x3/8	198	-29261.40	36939.50	79.2	Pass
T9	37.5 - 25	Diagonal	2L3 1/2x3 1/2x5/16	208	-31610.00	58613.30	53.9	Pass
							67.5 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16	211	-31587.80	58613.30	53.9	Pass
							67.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16	214	-37311.40	58613.30	63.7	Pass
							80.1 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16	217	-37328.60	58613.30	63.7	Pass
							80.0 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16	220	-31141.20	58613.30	53.1	Pass
							66.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16	223	-31146.20	58613.30	53.1	Pass
							66.6 (b)	
T10	25 - 0	Diagonal	2L4x3x3/8	233	-34197.70	42115.30	81.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	2L4x3x3/8	234	-34145.30	42115.30	81.1	Pass
		Diagonal	2L4x3x3/8	236	-40544.20	42115.30	96.3	Pass
		Diagonal	2L4x3x3/8	237	-40580.60	42115.30	96.4	Pass
		Diagonal	2L4x3x3/8	239	-33232.80	42115.30	78.9	Pass
		Diagonal	2L4x3x3/8	240	-33248.80	42115.30	78.9	Pass
		Diagonal	2L4x3x3/8	245	-32132.60	43926.10	73.2	Pass
		Diagonal	2L4x3x3/8	246	-32084.00	43926.10	73.0	Pass
		Diagonal	2L4x3x3/8	248	-38215.00	43926.10	87.0	Pass
		Diagonal	2L4x3x3/8	249	-38248.00	43926.10	87.1	Pass
		Diagonal	2L4x3x3/8	251	-31438.50	43926.10	71.6	Pass
		Diagonal	2L4x3x3/8	252	-31454.10	43926.10	71.6	Pass
T1	160 - 150	Horizontal	L3x3x1/4	7	-1252.81	29433.90	4.3 6.1 (b)	Pass
		Horizontal	L3x3x1/4	10	-1744.12	29433.90	5.9 8.4 (b)	Pass
		Horizontal	L3x3x1/4	13	-1954.37	29433.90	6.6 9.5 (b)	Pass
T2	150 - 125	Horizontal	L2 1/2x2 1/2x3/16	25	-5474.26	16005.30	34.2 38.3 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	28	-6690.85	16005.30	41.8 46.8 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	31	-6290.89	16005.30	39.3 44.0 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	34	-5142.15	16479.60	31.2 34.6 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	37	-6151.82	16479.60	37.3 41.2 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	40	-5980.79	16479.60	36.3 40.2 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	43	-911.16	16955.80	5.4 6.8 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	46	-1735.71	16955.80	10.2 12.0 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	49	-1815.98	16955.80	10.7 12.9 (b)	Pass
T3	125 - 100	Horizontal	L3x3x5/16	55	-9012.54	31894.50	28.3 35.6 (b)	Pass
		Horizontal	L3x3x5/16	58	-10606.20	31894.50	33.3 41.8 (b)	Pass
		Horizontal	L3x3x5/16	61	-10037.40	31894.50	31.5 39.6 (b)	Pass
		Horizontal	L3x3x5/16	67	-7540.42	32682.10	23.1 29.8 (b)	Pass
		Horizontal	L3x3x5/16	70	-9057.15	32682.10	27.7 35.8 (b)	Pass
		Horizontal	L3x3x5/16	73	-8131.00	32682.10	24.9 32.2 (b)	Pass
		Horizontal	L3x3x5/16	79	-6029.68	33472.00	18.0 23.7 (b)	Pass
		Horizontal	L3x3x5/16	82	-7384.66	33472.00	22.1 29.0 (b)	Pass
		Horizontal	L3x3x5/16	85	-6782.20	33472.00	20.3 26.6 (b)	Pass
T4	100 - 75	Horizontal	L3x3x1/2	97	-13645.80	45750.70	29.8 45.6 (b)	Pass
		Horizontal	L3x3x1/2	100	-15768.90	45750.70	34.5 52.5 (b)	Pass
		Horizontal	L3x3x1/2	103	-14138.40	45750.70	30.9 47.2 (b)	Pass
		Horizontal	L3x3x1/2	109	-12947.50	46961.00	27.6 43.0 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Horizontal	L3x3x1/2	112	-14882.70	46961.00	31.7 49.4 (b)	Pass
		Horizontal	L3x3x1/2	115	-13744.00	46961.00	29.3 45.7 (b)	Pass
T5	75 - 66.6667	Horizontal	L3x3x1/2	133	-15181.20	44548.30	34.1 50.6 (b)	Pass
		Horizontal	L3x3x1/2	136	-18001.90	44548.30	40.4 59.8 (b)	Pass
		Horizontal	L3x3x1/2	139	-15615.80	44548.30	35.1 52.0 (b)	Pass
T10	25 - 0	Horizontal	L4x4x1/2	232	-22611.40	62155.00	36.4 75.7 (b)	Pass
		Horizontal	L4x4x1/2	235	-26933.70	62155.00	43.3 90.0 (b)	Pass
		Horizontal	L4x4x1/2	238	-22021.30	62155.00	35.4 73.8 (b)	Pass
		Horizontal	L4x4x1/2	244	-20958.30	64003.00	32.7 69.2 (b)	Pass
		Horizontal	L4x4x1/2	247	-24812.40	64003.00	38.8 82.5 (b)	Pass
		Horizontal	L4x4x1/2	250	-20531.60	64003.00	32.1 68.4 (b)	Pass
T1	160 - 150	Top Girt	L3x3x1/4	4	-402.11	25371.20	1.6 1.9 (b)	Pass
		Top Girt	L3x3x1/4	5	-958.97	25371.20	3.8 4.5 (b)	Pass
		Top Girt	L3x3x1/4	6	-957.27	25371.20	3.8 4.5 (b)	Pass
T4	100 - 75	Top Girt	L3x3x1/4	94	-11148.90	16310.60	68.4	Pass
		Top Girt	L3x3x1/4	95	-12988.20	16310.60	79.6	Pass
		Top Girt	L3x3x1/4	96	-12245.00	16310.60	75.1	Pass
T6	66.6667 - 58.3333	Top Girt	L3x3x1/2	148	-16040.60	24547.70	65.3	Pass
		Top Girt	L3x3x1/2	149	-19052.70	24547.70	77.6	Pass
		Top Girt	L3x3x1/2	150	-16236.00	24547.70	66.1	Pass
T7	58.3333 - 50	Top Girt	L3x3x1/2	163	-16948.90	23013.00	73.6	Pass
		Top Girt	L3x3x1/2	164	-20144.90	23013.00	87.5	Pass
		Top Girt	L3x3x1/2	165	-17072.70	23013.00	74.2	Pass
T8	50 - 37.5	Top Girt	L4x4x1/4	190	-17962.20	23877.90	75.2	Pass
		Top Girt	L4x4x1/4	191	-21419.90	23877.90	89.7	Pass
		Top Girt	L4x4x1/4	192	-17877.30	23877.90	74.9	Pass
T9	37.5 - 25	Top Girt	L4x4x5/16	205	-19537.20	28223.90	69.2	Pass
		Top Girt	L4x4x5/16	206	-23278.20	28223.90	82.5	Pass
		Top Girt	L4x4x5/16	207	-19347.70	28223.90	68.6	Pass
T7	58.3333 - 50	Redund Horz 1 Bracing	L2x2x5/16	167	-3878.95	14336.70	27.1	Pass
		Redund Horz 1 Bracing	L2x2x5/16	170	-3922.49	14336.70	27.4	Pass
		Redund Horz 1 Bracing	L2x2x5/16	173	-3922.49	14336.70	27.4	Pass
		Redund Horz 1 Bracing	L2x2x5/16	176	-3897.90	14336.70	27.2	Pass
		Redund Horz 1 Bracing	L2x2x5/16	179	-3897.90	14336.70	27.2	Pass
		Redund Horz 1 Bracing	L2x2x5/16	182	-3878.95	14336.70	27.1	Pass
T9	37.5 - 25	Redund Horz 1 Bracing	L2x2x5/16	209	-5136.68	12351.20	41.6	Pass
		Redund Horz 1 Bracing	L2x2x5/16	212	-5194.45	12351.20	42.1	Pass
		Redund Horz 1	L2x2x5/16	215	-5194.45	12351.20	42.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing						
		Redund Horz 1 Bracing	L2x2x5/16	218	-5162.00	12351.20	41.8	Pass
		Redund Horz 1 Bracing	L2x2x5/16	221	-5162.00	12351.20	41.8	Pass
		Redund Horz 1 Bracing	L2x2x5/16	224	-5136.68	12351.20	41.6	Pass
T7	58.3333 - 50	Redund Diag 1 Bracing	L2x2x5/16	168	-2569.70	8572.07	30.0	Pass
		Redund Diag 1 Bracing	L2x2x5/16	171	-2598.54	8572.07	30.3	Pass
		Redund Diag 1 Bracing	L2x2x5/16	174	-2598.54	8572.07	30.3	Pass
		Redund Diag 1 Bracing	L2x2x5/16	177	-2582.26	8572.07	30.1	Pass
		Redund Diag 1 Bracing	L2x2x5/16	180	-2582.26	8572.07	30.1	Pass
		Redund Diag 1 Bracing	L2x2x5/16	183	-2569.70	8572.07	30.0	Pass
T9	37.5 - 25	Redund Diag 1 Bracing	L2x2x5/16	210	-4033.06	5040.84	80.0	Pass
		Redund Diag 1 Bracing	L2x2x5/16	213	-4078.42	5040.84	80.9	Pass
		Redund Diag 1 Bracing	L2x2x5/16	216	-4078.42	5040.84	80.9	Pass
		Redund Diag 1 Bracing	L2x2x5/16	219	-4052.94	5040.84	80.4	Pass
		Redund Diag 1 Bracing	L2x2x5/16	222	-4052.94	5040.84	80.4	Pass
		Redund Diag 1 Bracing	L2x2x5/16	225	-4033.06	5040.84	80.0	Pass
T3	125 - 100	Inner Bracing	L2 1/2x2x3/16	64	-13.24	4505.54	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	65	-13.31	4505.54	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	66	-13.18	4505.54	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	76	-12.70	4955.83	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	77	-12.76	4955.83	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	78	-12.62	4955.83	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	88	-12.10	5477.15	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	89	-12.16	5477.15	0.9	Pass
		Inner Bracing	L2 1/2x2x3/16	90	-12.03	5477.15	0.9	Pass
T4	100 - 75	Inner Bracing	L2 1/2x2x3/16	106	-14.90	3469.70	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	107	-14.96	3469.70	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	108	-14.83	3469.70	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	118	-14.74	3771.28	1.0	Pass
		Inner Bracing	L2 1/2x2x3/16	119	-14.81	3771.28	1.0	Pass
		Inner Bracing	L2 1/2x2x3/16	120	-14.68	3771.28	1.0	Pass
		Inner Bracing	L2 1/2x2x3/16	127	-228.47	4113.95	5.6	Pass
		Inner Bracing	L2 1/2x2x3/16	128	-228.47	4113.95	5.6	Pass
		Inner Bracing	L2 1/2x2x3/16	129	-215.70	4113.95	5.2	Pass
T5	75 - 66.6667	Inner Bracing	L2 1/2x2x3/16	142	-15.86	3202.90	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	143	-15.91	3202.90	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	144	-15.76	3202.90	1.1	Pass
T6	66.6667 - 58.3333	Inner Bracing	L2 1/2x2x3/16	157	-336.17	2965.74	11.3	Pass
		Inner Bracing	L2 1/2x2x3/16	158	-336.17	2965.74	11.3	Pass
		Inner Bracing	L2 1/2x2x3/16	159	-287.41	2965.74	9.7	Pass
T7	58.3333 - 50	Inner Bracing	L2 1/2x2x3/16	184	-354.70	2753.97	12.9	Pass
		Inner Bracing	L2 1/2x2x3/16	185	-354.69	2753.97	12.9	Pass
		Inner Bracing	L2 1/2x2x3/16	186	-301.51	2753.97	10.9	Pass
T8	50 - 37.5	Inner Bracing	L2 1/2x2 1/2x3/16	199	-379.16	3841.91	9.9	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	200	-379.15	3841.91	9.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Inner Bracing	L2 1/2x2 1/2x3/16	201	-319.21	3841.91	8.3	Pass
T9	37.5 - 25	Inner Bracing	L2 1/2x2 1/2x3/16	226	-410.25	3467.32	11.8	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	227	-410.24	3467.32	11.8	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	228	-345.39	3467.32	10.0	Pass
T10	25 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	241	-25.76	2865.56	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	242	-25.78	2865.56	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	243	-25.53	2865.56	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	253	-25.39	3144.96	1.1	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	254	-25.42	3144.96	1.1	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	255	-25.15	3144.96	1.1	Pass
							Summary	
						Leg (T10)	86.2	Pass
						Diagonal (T10)	96.4	Pass
						Horizontal (T10)	90.0	Pass
						Top Girt (T8)	89.7	Pass
						Redund Horz 1 Bracing (T9)	42.1	Pass
						Redund Diag 1 Bracing (T9)	80.9	Pass
						Inner Bracing (T7)	12.9	Pass
						Bolt Checks	90.0	Pass
						RATING =	**96.4**	**Pass**

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift:	Uplift := 388.871·kips	*user input*
Shear:	Shear := 58.923·kips	*user input*
Compression:	Compression := 443.539·kips	*user input*

Anchor Bolt Data:

Use ASTM A36	Use ASTM A36 per page 4.1 of structural analysis dated November 23, 1993		
Number of Anchor Bolts = N	N := 6	*user input*	
Bolt Ultimate Strength:	F_u := 58·ksi	*user input*	
Bolt Yield Strength:	Fy := 36·ksi	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	
Thickness of Anchor Bolts	D := 1.75in	*user input*	
Threads per Inch:	n := 5	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-15)
Length from top of pier to bottom of leveling nut:	L_{ar} := 0in	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 2.41\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 1.9\cdot in^2$$

Net Diameter:

$$D_n := D - \frac{0.9743 in}{n} \qquad D_n = 1.56\cdot in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.39\cdot in$$

Plastic Section Modulus of Bolt:

$$Z_x := \frac{D_n^3}{6} \qquad Z_x = 0.63\cdot in^3$$

Forces:

Tension Force:

$$T_u := \frac{Uplift}{N}$$

$T_u = 64.81\cdot kip$

$T_{ub} := T_u$

Shear Force:

$$V_u := \frac{Shear}{N}$$

$V_u = 9.82\cdot kip$ $\quad V_{ub} := V_u$

Resistance Factor for Flexure (ANSI/TIA-222-G 4.7):

$\phi_f := 0.9$

Resistance Factor for Anchor Bolt (ANSI/TIA-222-G 4.5.4.2):

$\phi_b := 0.80$

Resistance Factor for Tension (ANSI/TIA-222-G 4.9.6.1):

$\phi_t := 0.75$

Resistance Factor for Shear (ANSI/TIA-222-G 4.9.6.3):

$\phi_v := 0.75$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, Mn:

$M_n := Fy \cdot Z_x$

$M_n = 1.88 \cdot ft \cdot kip$

$\phi_f \cdot M_n = 1.69 \cdot ft \cdot kip$

Applied Moment due to Shear (worst case lever arm), Mu:

$M_u := L_{ar} \cdot V_u$

$M_u = 0 \cdot ft \cdot kip$

Flexure Check:

$FlexureCheck := if(M_u \le \phi_f \cdot M_n, "OK", "NO GOOD")$

FlexureCheck = "OK"

$\frac{M_u}{\phi_f \cdot M_n} = 0 \cdot \%$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, Rnt:

$R_{nt} := F_u \cdot A_n$

$R_{nt} = 110.17 \cdot ft \cdot kip$

$\phi_t \cdot R_{nt} = 82.63 \cdot ft \cdot kip$

Tension Check:

$TensionCheck := if(T_u \le \phi_t \cdot R_{nt}, "OK", "NO GOOD")$

TensionCheck = "OK"

$\frac{T_u}{\phi_t \cdot R_{nt}} = 78.44 \cdot \%$

ANSI/TIA-222-G 4.9.6.3 Design Shear Strength:

Design Shear Strength, Rnv:

$R_{nv} := 0.45 \cdot F_u \cdot A_g$

$R_{nv} = 62.78 \cdot ft \cdot kip$

$\phi_v \cdot R_{nv} = 47.08 \cdot ft \cdot kip$

Shear Check:

$ShearCheck := if(V_u \le \phi_v \cdot R_{nv}, "OK", "NO GOOD")$

ShearCheck = "OK"

$\frac{V_u}{\phi_v \cdot R_{nv}} = 20.86 \cdot \%$

ANSI/TIA-222-G 4.9.6.4 Combined Shear and Tension:

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1$$

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 = 0.66$$

Combined Shear and Tension Check:

$$\text{ShearAndTensionCheck} := \text{if}\left[\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

ShearAndTensionCheck = "OK"

ANSI/TIA-222-G 4.9.9 Anchor Rods (Capacity):

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot P_n} \le 1$$

$\eta := 0.55$ *user input from ANSI/TIA-222-G 4.9.9*

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} = 0.938$$

Capacity Check:

$$\text{CapacityCheck} := \text{if}\left[\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

CapacityCheck = "OK"

NOTE: Previous additional tensile reinforcement (project 60404004) for tower anchor is not required due to the existing anchor (previous to MODification) capacity being below the allowable stress limit, therefore the anchor calculation modifications have been removed for this case. Refer to Project 60404004, Rev 2. for reinforcement details.

FOUNDATION ANALYSIS

AECOM

				Page	of
Job	160' Stainless Lattice Tower - Middlebury, CT	Project No.		Sheet 1	of 10
Description	Foundation Analysis (TIA-222-G)	Computed by	MCD	Date	04/09/18
	MODification Analysis (AT&T / Sprint)	Checked by		Date	

PIER AND MAT FOUNDATION ANALYSIS - 3 PIERS

TOWER FORCES:

Moment Caused by Tower	$M_t := 8440 \cdot kip \cdot ft$
Shear at Base of Tower	$S_t := 107.451 \cdot kip$
Max Compressive Force	$C_t := 443.539 \cdot kip$
Max Uplift	$U_t := 388.871 \cdot kip$
Height of Tower	$H_t := 160 \cdot ft$
Width of Tower at Base	$W_t := 23 \cdot ft$
Weight of Tower	$WT_t := 1.0 \cdot kip$

NOTE: Weight of Tower is incorporated into the other loads listed above and is therefore set equal to one for programming.

FOOTING DIMENSIONS:

Width of Footing	$W_f := 36 \cdot ft$
Overall Depth of Footing	$D_f := 5 ft$
Length of Pier	$L_p := 3.75 \cdot ft$
Extension of Pier Above Grade	$L_{pag} := 1 \cdot ft$
Diameter of Pier	$d_p := 3.5 \cdot ft$
Thickness of Footing	$T_f := 2.25 \cdot ft$
Reinforement Cover:	$Cvr := 3 in$

MATERIAL PROPERTIES:

Compressive Strength of Concrete	$f'c := 3000 \cdot psi$	Unit Weight of Soil	$\gamma_s := 125 \cdot pcf$
Yield Strength of Steel Reinforcement	$fy := 60000 \cdot psi$	Unit Weight of Concrete	$\gamma_c := 150 \cdot pcf$
Internal Friction Angle of Soil	$\phi_s := 34 \cdot deg$	Depth to Neglect	$n := 0 \cdot ft$
Allowable Bearing Capacity	$q_s := 4500 \cdot psf$	Cohesion of Clay Type Soil	$c := 0 \cdot ksf$
Ultimate Bearing Capacity	$R_s := 2 \cdot q_s$	Note: Use 0 for Sandy Soil	

Coefficient of Lateral Soil Pressure $K_p := \frac{1 + \sin(\phi_s)}{1 - \sin(\phi_s)}$ $K_p = 3.5371$

What is Position of Center of Tower with respect to Center of Pad? 1=Offset 2=Not Offset $Pos_{tower} := 2$

STEEL REINFORCING:

PIER REINFORCEMENT:

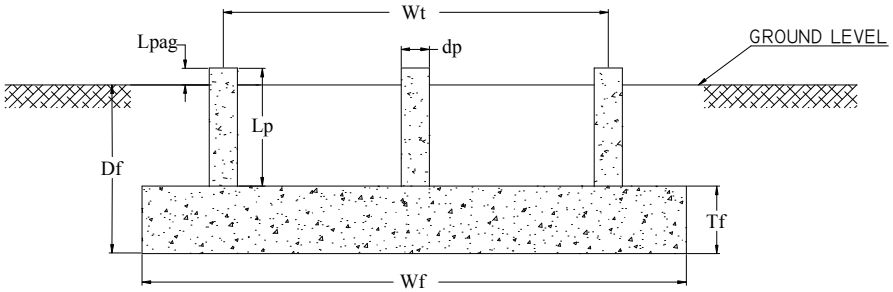
Bar Size	$BSpier := 9$	Bar Diameter	$d_{bpier} := 1.1280 \cdot in$
Number of Bars	$NBpier := 9$	Bar Area	$A_{bpier} := 1.0 \cdot in^2$

PAD REINFORCEMENT:

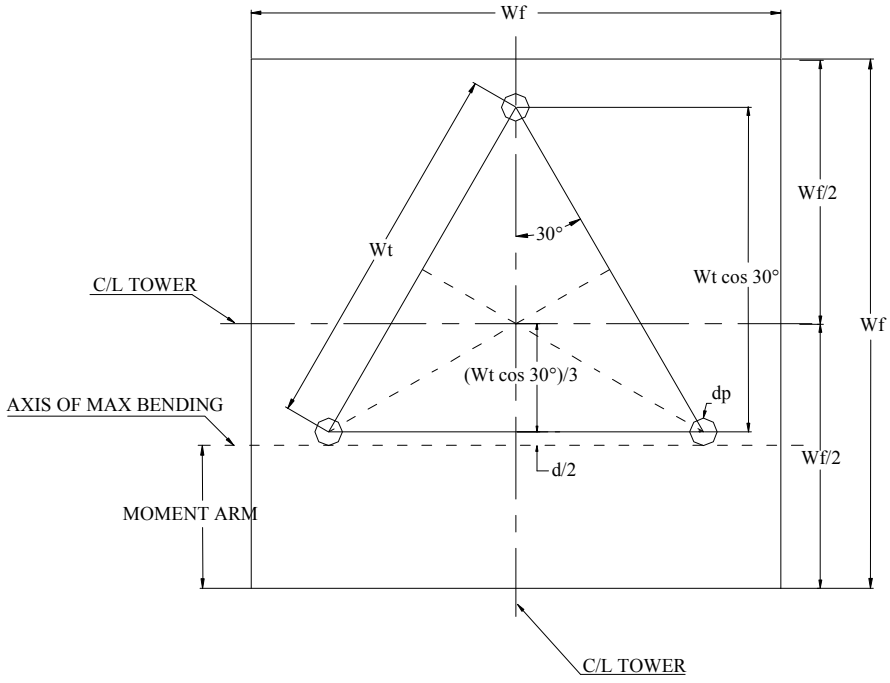
Bar Size	$BS_{pad} := 11$	Bar Diameter	$d_{bpad} := 1.41 \cdot in$
Number of Bars	$NB_{pad} := 34$	Bar Area	$A_{bpad} := 1.56 \cdot in^2$

NOTE: Bar equivalent used here for weakest Moment resistance.

FOUNDATION OVERVIEW



ELEVATION



PLAN

STABILITY OF FOOTING

NOTE: Reduction factor is implemented as 0.75 for pull-out/uplift of foundation. Reduction factor shall be applied to Overturning Moment in this case

Passive Pressure:

$P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{pn} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{pt} = 1.2159 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}]$ $\quad P_{top} = 1.2159 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{bot} = 2.2107 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2}$ $\quad P_{ave} = 1.7133 \cdot ksf$

Shear:

$T_{pp} := if[n < (D_f - T_f), T_f, (D_f - n)]$ $\quad T_{pp} = 2.25 \cdot ft$

$A_{pp} := W_f \cdot T_{pp}$ $\quad A_{pp} = 81 \cdot ft^2$

Ultimate Shear:

$S_u := P_{ave} \cdot A_{pp}$ $\quad S_u = 138.7772 \cdot kip$

Weight of Concrete Pad:

$WT_c := (W_f^2 \cdot T_f) \cdot \gamma_c$ $\quad WT_c = 437.4 \cdot kip$

Weight of Soil: above Footing:

$WT_{s1} := W_f^2 (|D_f - T_f|) \cdot \gamma_s$ $\quad WT_{s1} = 445.5 \cdot kip$

Weight of Soil Wedge at back face:

$WT_{s2} := \left[\frac{(D_f - n)^2 \cdot \tan(\phi_s)}{2} \cdot W_f \right] \cdot \gamma_s$ $\quad WT_{s2} = 37.9411 \cdot kip$

Distance to center of Tower Leg from Edge of Footing:

$X_{t1} := \frac{W_f}{2} - \frac{W_t \cdot \cos(30 \cdot deg)}{2}$ $\quad X_{t2} := \frac{W_f}{2} - \frac{W_t \cdot \cos(30 \cdot deg)}{3}$

$X_t := if(Pos_{tower} = 1, X_{t1}, X_{t2})$ $\quad X_t = 11.3605 \cdot ft$

Additional Offset of Footing:

$X_{off1} := \frac{W_f}{2} - \left(\frac{W_t \cdot \cos(30 \cdot deg)}{3} + X_t \right)$ $\quad X_{off2} := 0$

$X_{off} := if(Pos_{tower} = 1, X_{off1}, X_{off2})$ $\quad X_{off} = 0 \cdot ft$

Resisting Moment:

$M_r := \left[0.9 (WT_c + WT_{s1}) \right] \cdot \frac{W_f}{2} + 0.90 \cdot \left[WT_t \cdot \left(\frac{W_f}{2} - X_{off} \right) \right] + 0.90 \cdot \left(S_u \cdot \frac{T_{pp}}{3} \right) \ldots$ $\quad M_r = 15659.4207 \cdot kip \cdot ft$

$+ WT_{s2} \cdot 0.90 \cdot \left(W_f + \frac{T_{pp} \cdot \tan(\phi_s)}{3} \right)$

$\phi_{OT} := 0.75$ ***ANSI/TIA-222-G REDUCTION FACTOR***

(Factored) Overturning Moment:

$M_{ot} := M_t + S_t \cdot (L_p + T_f) + WT_t \cdot X_{off}$ $\quad M_{ot} = 9084.706 \cdot kip \cdot ft$

Overturn Ratio (%):

$Ratio_{Stability} := \frac{M_{ot}}{M_r \cdot \phi_{OT}}$ $\quad Ratio_{Stability} = 77.35 \cdot \%$

$StabilityCheck := if(M_r \cdot \phi_{OT} > M_{ot}, "Okay", "No Good")$ $\quad StabilityCheck = "Okay"$

BEARING PRESSURE CHECK:

Pressure Applied:

$LOAD_{tot} := \left(WT_c + WT_{s1} + WT_t\right) \cdot 0.9$ $\quad LOAD_{tot} = 795.51 \cdot kip$

$A_{mat} := W_f^{\,2}$ $\quad A_{mat} = 1296 \cdot ft^2$

$S := \frac{W_f^{\,3}}{6}$ $\quad S = 7776 \cdot ft^3$

$P_{max} := \frac{LOAD_{tot}}{A_{mat}} + \frac{M_{ot}}{S}$ $\quad P_{max} = 1.7821 \cdot ksf$

$P_{min} := \frac{LOAD_{tot}}{A_{mat}} - \frac{M_{ot}}{S}$ $\quad P_{min} = -0.5545 \cdot ksf$

$MaxPressure := if\left(P_{max} < 0.75 R_s, "Okay", "No Good"\right)$ $\quad MaxPressure = "Okay"$

$MinPressure := if\left[\left(P_{min} \geq 0\right) \cdot \left(P_{min} < 0.75 \cdot R_s\right), "Okay", "No Good"\right]$ $\quad MinPressure = "No Good"$

Distance to Resultant of Pressure Distribution:

$X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3}$ $\quad X_p = 9.1524 \cdot ft$

Distance to Kern:

$X_k := \frac{W_f}{3}$ $\quad X_k = 12 \cdot ft$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity:

$e := \frac{M_{ot}}{LOAD_{tot}}$ $\quad e = 11.42$

Adjusted Soil Pressure:

$q_a := \frac{2 \cdot LOAD_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)}$ $\quad q_a = 2.2388 \cdot ksf$

Revised Maximum:

$q_{max} := if\left(X_p < X_k, q_a, P_{max}\right)$ $\quad q_{max} = 2.2388 \cdot ksf$

$PressureCheck := if\left(q_{max} < 0.75 \cdot R_s, "Okay", "No Good"\right)$ $\quad PressureCheck = "Okay"$

CHECK PUNCHING AND BEAM SHEAR:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.3)

$d := T_f - Cvr - .5\cdot in$ $d = 23.5\cdot in$

Factored load: $FL := \frac{C_t}{W_f^2}$ $FL = 0.3422\cdot ksf$

$V_{req} := \frac{FL\cdot\left(X_t - 0.5\cdot d_p - d\right)\cdot W_f}{\phi_c}$ $V_{req} = 110.9157\cdot kip$

ACI 11.3.1.1 $V_{Avail} := 2\cdot\sqrt{f'c\cdot psi}\cdot W_f\cdot d$ $V_{Avail} = 1112.0959\cdot kip$

$BeamShearCheck := if\left(V_{req} < V_{Avail}, "Okay", "No Good"\right)$ BeamShearCheck = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.12.2.1)

$b_o := \left(d_p + d\right)\cdot\pi$ $b_o = 17.1479\cdot ft$

$V_{req} := FL\cdot\frac{W_f^2 - \left(d_p + d\right)^2\cdot\frac{\pi}{4}}{\phi_c}$ $V_{req} = 512.3891\cdot kip$

$V_{Avail} := 4\cdot\sqrt{f'c\cdot psi}\cdot b_o\cdot d$ $V_{Avail} = 1059.448\cdot kip$

$PunchingShearCheck := if\left(V_{req} < V_{Avail}, "Okay", "No Good"\right)$

PunchingShearCheck = "Okay"

TENSILE REINFORCEMENT IN PAD:

$\phi_m := 0.90$ per ACI 9.3.2.2

Applied Moments:

$$M_{nT} := \left[U_t \cdot \left(W_t \cdot \sin(60 \cdot deg) - \frac{d_p}{2}\right) + S_t \cdot \left(D_f + L_{pag}\right)\right] - WT_t \cdot 1.2 \cdot X_{off}$$

$$M_{nS} := -1 \cdot \left[\begin{array}{l} \frac{1}{2} \cdot \left(\frac{W_f}{2} + \frac{W_t}{3} \cdot \cos(30 \cdot deg) - \frac{d_p}{2}\right)^2 \cdot 0.9 W_t \cdot \left[\gamma_s \cdot \left(T_{pp} - T_f\right)\right] \ldots \\ + 0.9 WT_{s2} \cdot \left[\frac{W_f}{2} + \frac{W_t}{3} \cdot \cos(30 \cdot deg) - \frac{d_p}{2} + \left(D_f - n\right) \cdot \tan\left(\phi_s\right)\right] \end{array}\right]$$

$$M_{nC} := -1 \cdot \left[\frac{1}{2} \cdot \left(\frac{W_f}{2} + \frac{W_t}{3} \cdot \cos(30 \cdot deg) - \frac{d_p}{2}\right)^2 \cdot 0.9 W_t \cdot \left(\gamma_c \cdot T_f\right)\right]$$

Design Moment: $M_n := \frac{M_{nT} + M_{nS} + M_{nC}}{\phi_m}$ $M_n = 5536.6845 \cdot kips \cdot ft$

Required Reinforcement:

ACI 10.2.7.3 $\beta := if\left[f'c \le 4000 \cdot psi, .85, if\left[f'c \ge 8000 \cdot psi, .65, .85 - \left(\frac{\frac{f'c}{psi} - 4000}{1000}\right) \cdot .05\right]\right]$ $\beta = 0.85$

Effective Width: $b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p$ $b_{eff} = 281.023 \cdot in$

$A_s := \frac{M_n}{\phi_m \cdot fy \cdot d}$ $A_s = 52.3564 \cdot in^2$

$a := \frac{A_s \cdot fy}{\beta \cdot f'c \cdot b_{eff}}$ $a = 4.3837 \cdot in$

$A_s := \frac{M_n}{fy \cdot \left(d - \frac{a}{2}\right)}$ $A_s = 51.9677 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} \cdot d}$ $\rho = 0.0079$

Temperature and Shrinkage: (ACI 7.12.2.1b)

$\rho_{sh} := if(fy \geq 60000 \cdot psi, 0.0018, 0.0020)$ $\rho_{sh} = 0.0018$

Area Required: $As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right)$ $As = 51.9677 \cdot in^2$

Area Provided: $As_{prov} := A_{bpad} \cdot NB_{pad}$ $As_{prov} = 53.04 \cdot in^2$

$PadReinforcement := if(As_{prov} > As, "Okay", "No Good")$ PadReinforcement = "Okay"

NOTE: Moment applied to area of steel has applied the Load factor and Resistance factor to obtain the following result.

$\frac{As}{As_{prov}} = 98.0 \cdot \%$

DEVELOPMENT LENGTH OF PAD REINFORCEMENT:

TENSION (ACI 12.2.3)

Bar Spacing: $B_{sPad} := \frac{W_f - 2 \cdot Cvr - NB_{pad} \cdot d_{bpad}}{NB_{pad} - 1}$ $B_{sPad} = 11.4564 \cdot in$

Development Length Factors:

Reinforcement Location Factor $\alpha := 1.0$

Coating Factor $\beta := 1.0$

Concrete strength Factor $\lambda := 1.0$

Reinforcement Size Factor $\gamma := 1.0$

Spacing or Cover Dimension: $c := if\left(Cvr < \frac{B_{sPad}}{2}, Cvr, \frac{B_{sPad}}{2}\right)$ $c = 3 \cdot in$

Transverse Reinforcement Inde As allowed by ACI 12.2.4 $k_{tr} := 0$

Development Length: $L_{dbt} := \frac{3}{40} \cdot \frac{fy}{\sqrt{f'c \cdot psi}} \cdot \frac{\alpha \cdot \beta \cdot \gamma \cdot \lambda}{\frac{c + k_{tr}}{d_{bpad}}} \cdot d_{bpad}$ $L_{dbt} = 54.4464 \cdot in$

$L_{dbmin} := 12 \cdot in$

Minimum Development Length: (ACI 12.2.1) $L_{dbtCheck} := if(L_{dbt} \geq L_{dbmin}, "Use L.dbt", "Use L.dbmin")$ $L_{dbtCheck} = "Use L.dbt"$

Available Length in Pad: $L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr$ $L_{Pad} = 75 \cdot in$

$LpadTension := if(L_{Pad} > L_{dbt}, "Okay", "No Good")$ LpadTension = "Okay"

REINFORCEMENT IN PIER:

$A_p := \frac{\pi \cdot d_p^{\,2}}{4}$ $\quad A_p = 1385.4424 \cdot in^2$

(ACI 10.8.4 and 10.9.1)

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p$ $\quad A_{smin} = 6.9272 \cdot in^2$

$A_{sprov} := NBpier \cdot A_{bpier}$ $\quad A_{sprov} = 9 \cdot in^2$

$SteelAreaCheck := if\left(A_{sprov} > A_{smin}, "Okay", "No Good"\right)$ $\quad SteelAreaCheck = "Okay"$

Bar Spacing In Pier: $B_{sPier} := \frac{d_p \cdot \pi}{NBpier} - d_{bpier}$ $\quad B_{sPier} = 13.5328 \cdot in$

Diamter of Reinforcement Cage: $Diam_{cage} := d_p - 2 \cdot Cvr$ $\quad Diam_{cage} = 36 \cdot in$

Maximum Moment in Pier: $M_p := \left(S_t \cdot L_p\right)$ $\quad M_p = 4835.295 \cdot kips \cdot in$

Pier Check evaluated from outside program and results are listed below;

(defined variables) $\left(f'_c \;\; f_y \;\; cl \;\; Spiral\right) = (3 \;\; 60 \;\; 4 \;\; 0)$

The required input is column diameter in inches, number of reinforcing bars, bar size number, factored axial load in kips and moment in kip inches:

$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) := (42 \;\; 9 \;\; 9 \;\; 525.6 \;\; 5751)$

Clears any previous output: $\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := (0 \;\; 0 \;\; 0 \;\; 0)$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := \phi P'_n\left(D, N, n, P_u, M_{xu}\right)^T$

The Output is given as useable axial load in kips, moment capacity in kip inches, splicing stress in ksi, and reinforcement ratio: $\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) = (1296.7567 \;\; 14188.8273 \;\; -60 \;\; 0.0065)$

Column size and reinforcement may be changed to match capacity to the applied load.

$AxialLoadCheck := if\left(\phi P_n \geq P_u, "Okay", "No Good"\right)$ $\quad AxialLoadCheck = "Okay"$

$BendingCheck := if\left(\phi M_{xn} \geq M_{xu}, "Okay", "No Good"\right)$ $\quad BendingCheck = "Okay"$

DEVELOPMENT LENGTH OF PIER REINFORCEMENT:

TENSION (ACI 12.2.3)

Spacing and Cover: $Cvr = 3\cdot in$ $B_{sPier} = 13.5328\cdot in$

Factors for development:

Reinforcement Location Factor	$\alpha := 1.0$
Coating Factor	$\beta := 1.0$
Concrete strength Factor	$\lambda := 1.0$
Reinforcement Size Factor	$\gamma := 1.0$

Spacing or Cover Dimension: $c := if\left(Cvr < \frac{B_{sPier}}{2}, Cvr, \frac{B_{sPier}}{2}\right)$ $c = 3\cdot in$

Transverse Reinforcement: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40}\cdot\frac{fy}{\sqrt{f'c\cdot psi}}\cdot\frac{\alpha\cdot\beta\cdot\gamma\cdot\lambda}{\frac{c+k_{tr}}{d_{bpier}}}\cdot d_{bpier} \qquad L_{dbt} = 34.8457\cdot in$$

Minimum Development Length: (ACI 12.2.1) $L_{dbmin} := 12\cdot in$

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right)$ $L_{dbtCheck} = "Use\ L.dbt"$

COMPRESSION: (ACI 12.3.2)

$$L_{dbc1} := \frac{.02\cdot d_{bpier}\cdot fy}{\sqrt{f'c\cdot psi}} \qquad L_{dbc1} = 24.7132\cdot in$$

$L_{dbmin} := 0.0003\cdot\frac{in^2}{lb}\cdot\left(d_{bpier}\cdot fy\right)$ $L_{dbmin} = 20.304\cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right)$ $L_{dbc} = 24.7132\cdot in$

AECOM

				Page	of
Job	160' Stainless Lattice Tower - Middlebury, CT	Project No.		Sheet 10	of 10
Description	Foundation Analysis (TIA-222-G)	Computed by	MCD	Date	04/09/18
	MODification Analysis (AT&T / Sprint)	Checked by		Date	

Available Length in Pier:

$L_{pier} := L_p - 3 \cdot in$ $\quad L_{pier} = 42 \cdot in$

$L_{piertension} := if\left(L_{pier} > L_{dbt}, "Okay", "No Good"\right)$ $\quad L_{piertension} = "Okay"$

$L_{piercompression} := if\left(L_{pier} > L_{dbc}, "Okay", "No Good"\right)$ $\quad L_{piercompression} = "Okay"$

Available Length in Pad:

$L_{pad} := T_f - 3 \cdot in$ $\quad L_{pad} = 24 \cdot in$

$L_{padtension} := if\left[L_{pad} > \left(L_{dbt} - L_{pier}\right), "Okay", "No Good"\right]$ $\quad L_{padtension} = "Okay"$

$L_{padcompression} := if\left[L_{pad} > \left(L_{dbc} - L_{pier}\right), "Okay", "No Good"\right]$ $\quad L_{padcompression} = "Okay"$

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

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500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
860-529-8882
Fax: 860-529-3991

Sprint

PROJECT: DO MACRO UPGRADE

SITE NAME: (R2E) CT3677 TO CT03XC028 SOUTH ST / I-84 (POLICE TOWER)

SITE CASCADE: CT03XC028

SITE ADDRESS: SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SITE TYPE: SELF SUPPORT TOWER

MARKET: SOUTHERN CONNECTICUT

SITE INFORMATION

TOWER OWNER:
STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC SAFETY
DIVISION OF STATE POLICE
1111 COUNTRY CLUB ROAD
MIDDLETOWN, CT 06457

LATITUDE (NAD83):
41° 30' 48.64" N
41.513511

LONGITUDE (NAD83):
73° 7' 27.16" W
-73.124211

COUNTY:
NEW HAVEN

ZONING JURISDICTION:
N/A

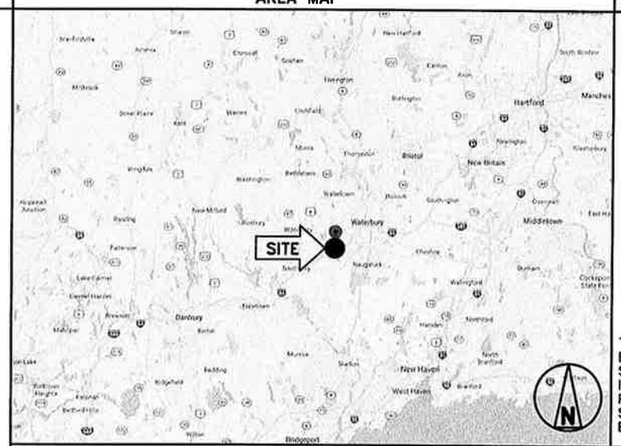
ZONING DISTRICT:
N/A

POWER COMPANY:
UNITED ILLUMINATING
PHONE: (800) 722-5584

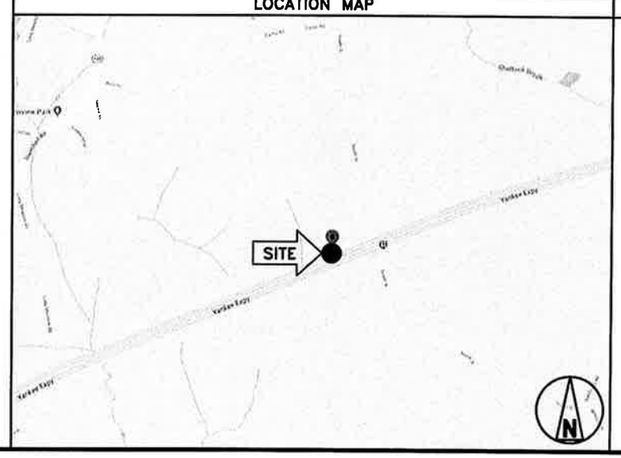
MAV PROVIDER:

PROJECT MANAGER:
AIROSMITH DEVELOPMENT
TERRI BURKHOLDER
(315) 719-2928
TBURKHOLDER@AIROSMITHDEVELOPMENT.COM

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) 800 MHz RRH'S BEHIND ANTENNAS
- INSTALL (3) 2.5 GHz RRH'S BEHIND ANTENNAS
- INSTALL (24) JUMPER CABLES
- INSTALL (1) HYBRID CABLE
- INSTALL 2.5 EQUIPMENT INSIDE EXISTING N.V. MMBS CABINET

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. INFINIGY 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.

APPLICABLE CODES

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

1. INTERNATIONAL BUILDING CODE (2015 IBC)
2. TIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

811 Know what's below. Call before you dig. www.call811.com

DRAWING INDEX

SHEET NO.	SHEET TITLE	REV.
T-1	TITLE SHEET & PROJECT DATA	0
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SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	EQUIPMENT & MOUNTING DETAILS	0
A-5	CIVIL DETAILS	0
A-6	PLUMBING DIAGRAM	0
E-1	ELECTRICAL & GROUNDING PLAN	0
E-2	ELECTRICAL & GROUNDING DETAILS	0
S-1	MOUNT MODIFICATION DETAILS	0
S-2	MOUNT MODIFICATION DETAILS	0

PLANS PREPARED FOR:
Sprint

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:
AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (518) 306-3740

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
REGISTERED
SEP 17 2018
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
TITLE SHEET & PROJECT DATA

SHEET NUMBER:
T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

1. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
7. AMERICAN CONCRETE INSTITUTE (ACI)
8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
11. PORTLAND CEMENT ASSOCIATION (PCA)
12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
13. BRICK INDUSTRY ASSOCIATION (BIA)
14. AMERICAN WELDING SOCIETY (AWS)
15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
17. DOOR AND HARDWARE INSTITUTE (DHI)
18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
19. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.

B. COMPANY: SPRINT CORPORATION

C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.

D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.

E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

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

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.

C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED

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

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

PLANS PREPARED FOR:

Sprint

PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:

AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (518) 306-3740

ENGINEERING LICENSE:

STATE OF CONNECTICUT JOHN S. STEVENS No. 24705 LICENSED PROFESSIONAL ENGINEER SEP 17 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:

(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:

CT03XC028

SITE ADDRESS:

SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.

1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN

D. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

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

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

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;

1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPs

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

1. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
2. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

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

1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)

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PROJECT MANAGER:
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OFFICE#. (518) 308-3740

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
OCT 17 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
SPRINT SPECIFICATIONS

SHEET NUMBER:
SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.

8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.

9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

11. ALL AVAILABLE JURISDICTIONAL INFORMATION

12. PDF SCAN OF REDLINES PRODUCED IN FIELD

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.

1. CONCRETE MIX AND CYLINDER BREAK REPORTS.

2. STRUCTURAL BACKFILL COMPACTION REPORTS.

3. SITE RESISTANCE TO EARTH TEST.

4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION

5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.

6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.

2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;

3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.

4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;

6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.

7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.

9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:

1. 1SHELTER AND TOWER OVERVIEW.

2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).

3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).

4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).

5. PHOTOS OF TOWER SECTION STACKING.

6. CONCRETE TESTING / SAMPLES.

7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.

8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.

9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.

10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.

11. COAX CABLE ENTRY INTO SHELTER.

12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.

14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.

15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.

16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.

17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.

18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.

19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.

21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

25. ALL BTS GROUND CONNECTIONS.

26. ALL GROUND TEST WELLS.

27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.

28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.

29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.

30. GPS ANTENNAS.

31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.

32. DOGHOUSE/CABLE EXIT FROM ROOF.

33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.

34. MASTER BUS BAR.

35. TELCO BOARD AND NIU.

36. ELECTRICAL DISTRIBUTION WALL.

37. CABLE ENTRY WITH SURGE SUPPRESSION.

38. ENTRANCE TO EQUIPMENT ROOM.

39. COAX WEATHERPROOFING-TOP AND BOTTOM OF TOWER.

40. COAX GROUNDING -TOP AND BOTTOM OF TOWER.

41. ANTENNA AND MAST GROUNDING.

42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

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www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:
AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (518) 308-3740

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
24107
LICENSED PROFESSIONAL ENGINEER
SEP 17 2018

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

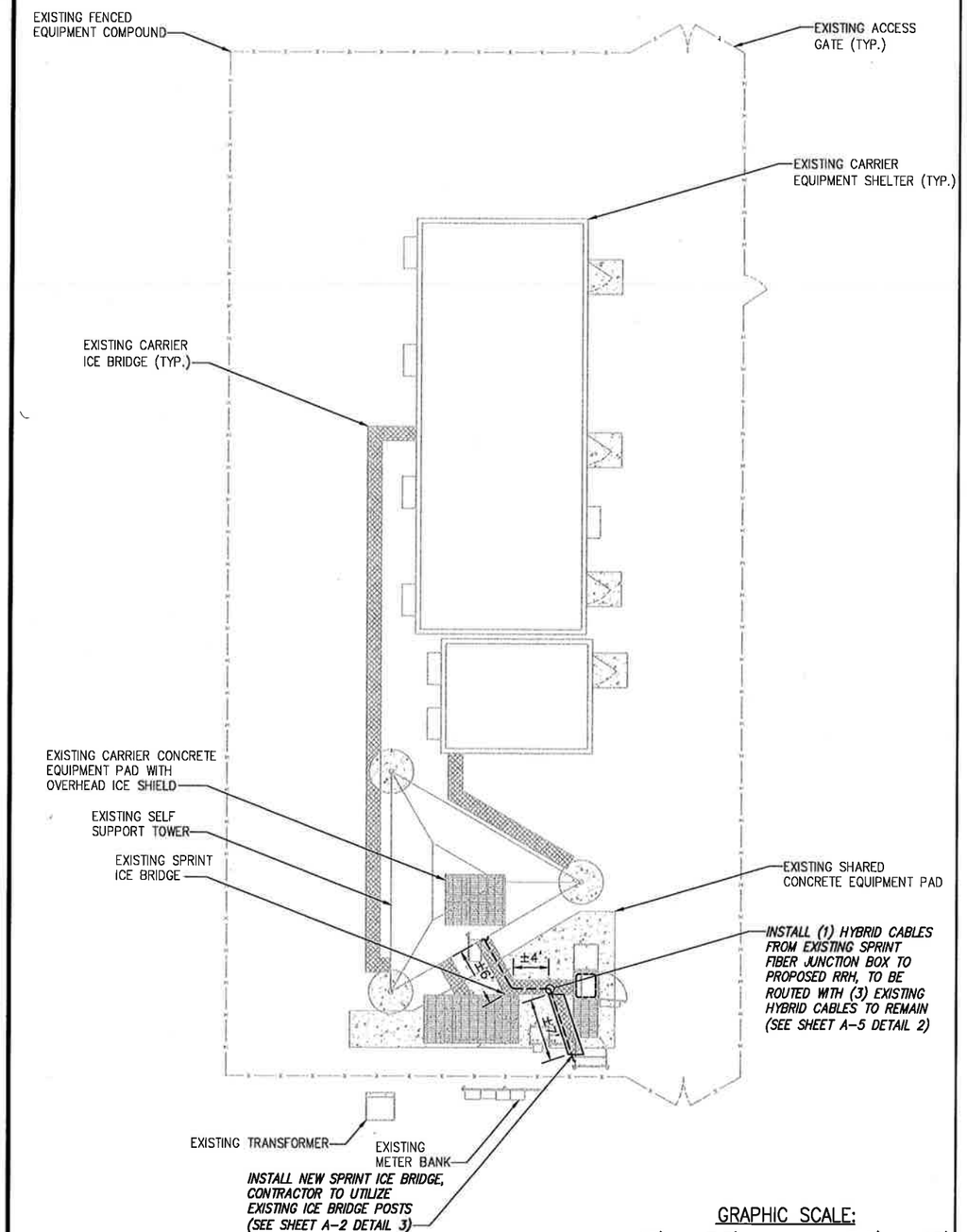
SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
SPRINT SPECIFICATIONS

SHEET NUMBER:
SP-3



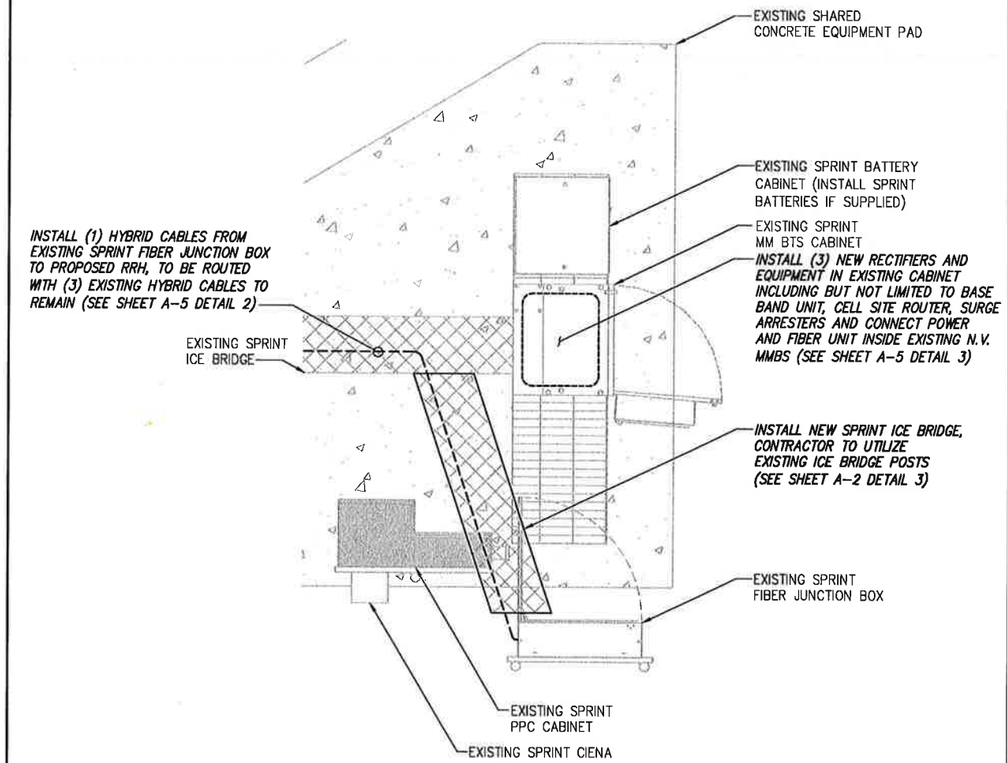
INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.

GRAPHIC SCALE:

15' 7.5' 0 7.5' 15'

SCALE (11x17): 1" = 15'-0"
SCALE (22x34): 1" = 7'-6"

OVERALL SITE PLAN | SCALE: AS NOTED | 1



GRAPHIC SCALE:

10' 5' 0 5' 10'

SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"

SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint

PLANS PREPARED BY:

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Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:

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OFFICE#. (518) 306-3740

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER
SEP 17 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:

(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:

CT03XC028

SITE ADDRESS:

SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:

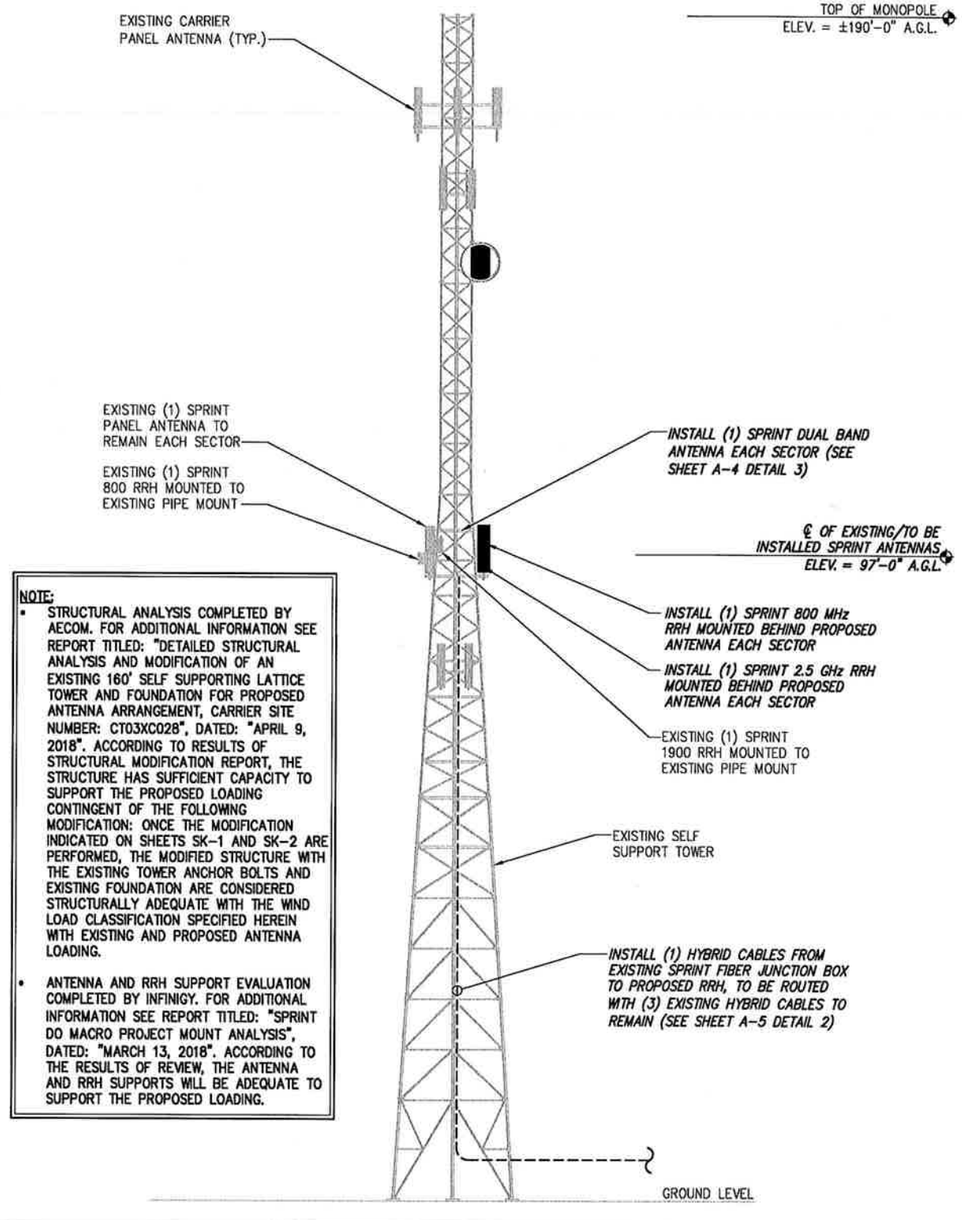
SITE PLAN

SHEET NUMBER:

A-1

NOTE:
INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING STRUCTURE FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

NOTE:
SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT



NOTE:
- STRUCTURAL ANALYSIS COMPLETED BY AECOM. FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 160' SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT, CARRIER SITE NUMBER: CT03XC028", DATED: "APRIL 9, 2018". ACCORDING TO RESULTS OF STRUCTURAL MODIFICATION REPORT, THE STRUCTURE HAS SUFFICIENT CAPACITY TO SUPPORT THE PROPOSED LOADING CONTINGENT OF THE FOLLOWING MODIFICATION: ONCE THE MODIFICATION INDICATED ON SHEETS SK-1 AND SK-2 ARE PERFORMED, THE MODIFIED STRUCTURE WITH THE EXISTING TOWER ANCHOR BOLTS AND EXISTING FOUNDATION ARE CONSIDERED STRUCTURALLY ADEQUATE WITH THE WIND LOAD CLASSIFICATION SPECIFIED HEREIN WITH EXISTING AND PROPOSED ANTENNA LOADING.
- ANTENNA AND RRH SUPPORT EVALUATION COMPLETED BY INFINIGY. FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "SPRINT DO MACRO PROJECT MOUNT ANALYSIS", DATED: "MARCH 13, 2018". ACCORDING TO THE RESULTS OF REVIEW, THE ANTENNA AND RRH SUPPORTS WILL BE ADEQUATE TO SUPPORT THE PROPOSED LOADING.

TOWER ELEVATION | NO SCALE | 1

SITE LOADING CHART

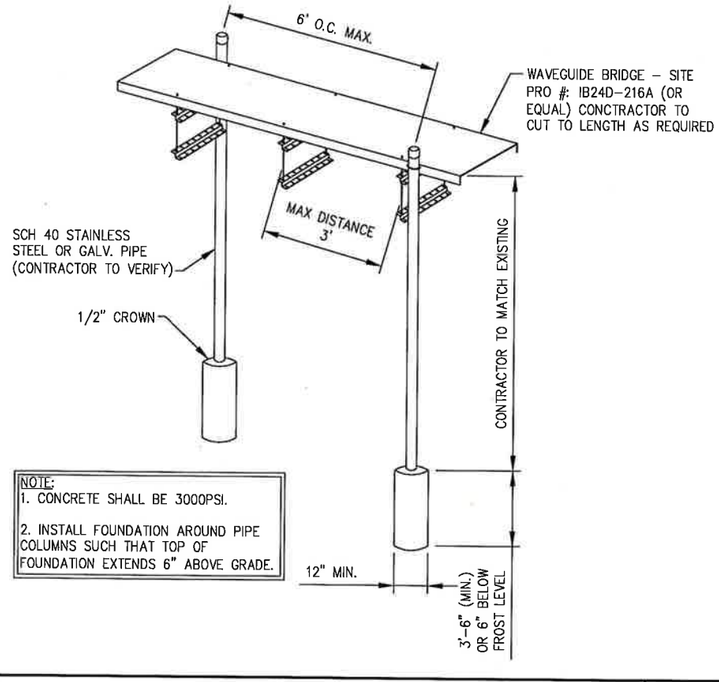
SECTOR	EXISTING/ PROPOSED	ANTENNA MODEL #	VENDOR	AZIMUTH	QTY.	REMAIN/ REMOVED	RRH (QTY/MODEL)	CABLE	CABLE LENGTH	RAD CENTER
ALPHA	PROPOSED	DT465B-2XR	COMM-SCOPE	340°	1	–	(2) 800 MHZ 2X50W RRH W/ FILTER (1) TD-RRH8X20-25 W/ SOLAR SHIELD (1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1	±135'*	±97' AGL
	EXISTING	APXVSPP18-C-A20	RFS	340°	1	REMAIN		EXISTING HYBRID		
BETA	PROPOSED	DT465B-2XR	COMM-SCOPE	90°	1	–	(2) 800 MHZ 2X50W RRH W/ FILTER (1) TD-RRH8X20-25 W/ SOLAR SHIELD (1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1		±97' AGL
	EXISTING	APXVSPP18-C-A20	RFS	90°	1	REMAIN		EXISTING HYBIRD		
GAMMA	PROPOSED	DT465B-2XR	COMM-SCOPE	260°	1	–	(2) 800 MHZ 2X50W RRH W/ FILTER (1) TD-RRH8X20-25 W/ SOLAR SHIELD (1) 1900 MHz 4X45 RRH	SEE SHEET A-5 DETAIL 1		±97' AGL
	EXISTING	APXVSPP18-C-A20	RFS	260°	1	REMAIN		EXISTING HYBRID		

PROJECT SCOPE:

REMOVE: (3) PANEL ANTENNAS *INSTALL: (3) PANEL ANTENNAS AND (6) RRH'S*

* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.

SITE LOADING CHART | NO SCALE | 2



NOTE:
1. CONCRETE SHALL BE 3000PSI.
2. INSTALL FOUNDATION AROUND PIPE COLUMNS SUCH THAT TOP OF FOUNDATION EXTENDS 6" ABOVE GRADE.

ICE BRIDGE DETAIL | NO SCALE | 3

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www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:

AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (518) 306-3740

ENGINEERING LICENSE:
STATE OF CONNECTICUT · JOHN S. STEVENS · No. 24703 · LICENSED PROFESSIONAL ENGINEER · SEP 17 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

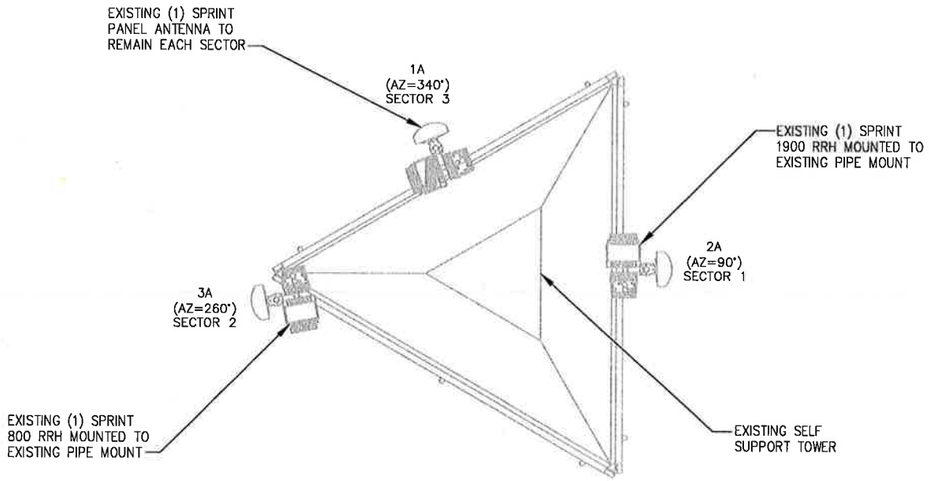
SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

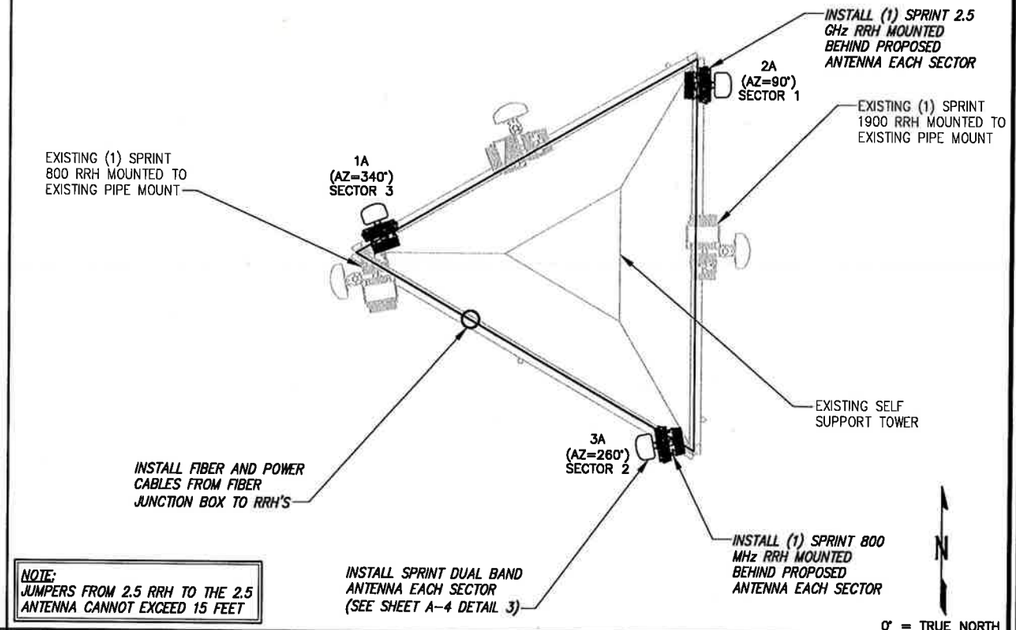
SHEET DESCRIPTION:
TOWER ELEVATION

SHEET NUMBER:
A-2



EXISTING ANTENNA LAYOUT | NO SCALE | 1

THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

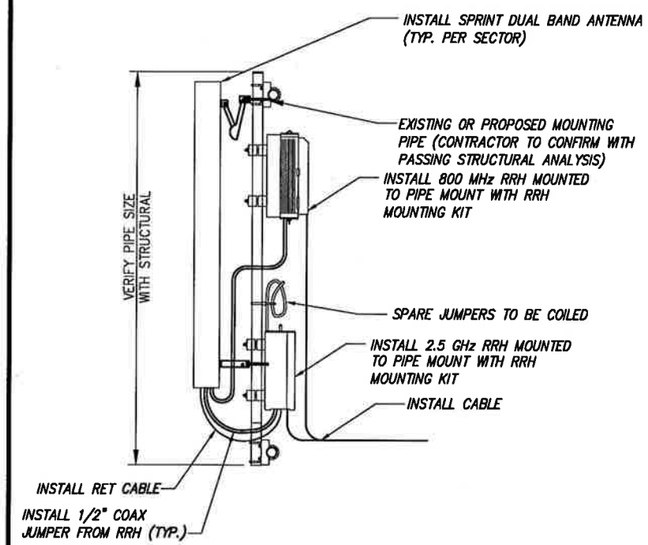


NOTE:
JUMPERS FROM 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15 FEET

FINAL ANTENNA & RRH LAYOUT | NO SCALE | 2

NOTE:
CONTRACTOR TO POSITION RRH ON MOUNT BEHIND ANTENNA SUCH THAT THE RRH DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

NOTE:
THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRH MOUNTING DETAILS



NOTES:

1. CUT DC CONDUCTORS TO LENGTH.
2. COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
3. DO NO EXCEED BEND RADIUS.

TYPICAL ANTENNA & RRH MOUNTING DETAILS | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

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OFFICE#. (518) 306-3740

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
SEP 17 2018

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DESCRIPTION	DATE	BY	REV.
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SITE NUMBER:
CT03XC028

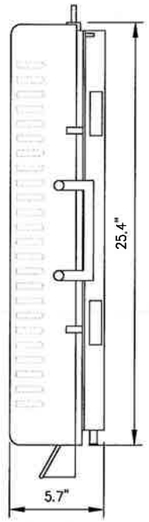
SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
ANTENNA LAYOUT & MOUNTING DETAILS

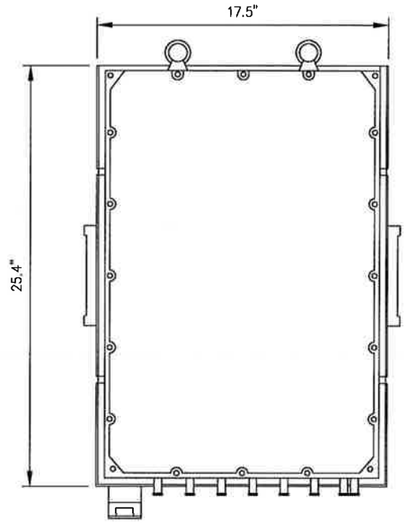
SHEET NUMBER:
A-3

RRH: ALCATEL LUCENT TD-RRH8X20

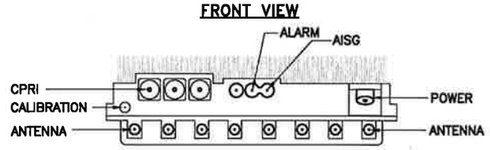
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW



PLAN VIEW

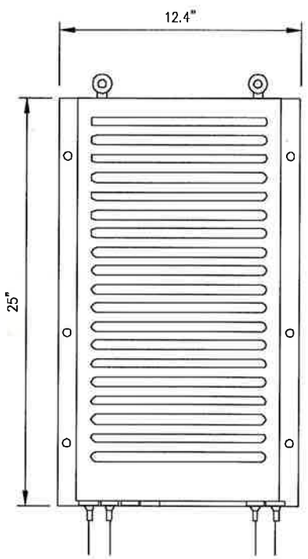
NOTES

COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.

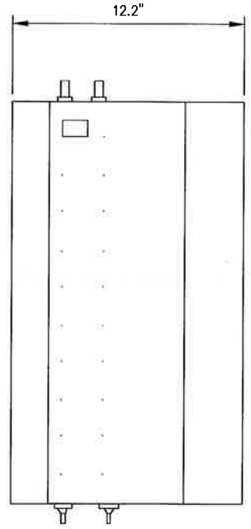
2.5 RRH'S	NO SCALE	1

RRH: ALCATEL LUCENT 1900 MHz

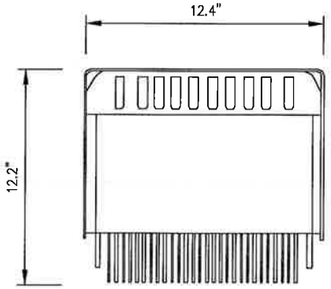
COLOR: LIGHT GREY
WEIGHT: 70 LBS.
(INCLUDING OPTIONAL SOLAR SHIELD)



FRONT VIEW



SIDE VIEW

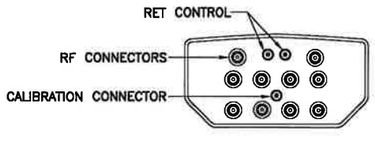


TOP VIEW

EXISTING 1900 MHz RRH	NO SCALE	2

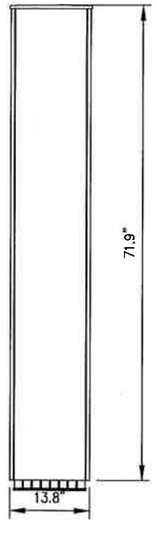
ANTENNA COMMSCOPE DT465B-2XR

RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD.In(mlm):	71.9"x13.8"x8.2" (1825x350x209mm)
WEIGHT:	58 lbs
CONNECTORS:	(2) 7/16" DIN FEMALE
	(8) 4.1/9.5 DIN FEMALE



PLAN VIEW

SIDE VIEW



FRONT VIEW

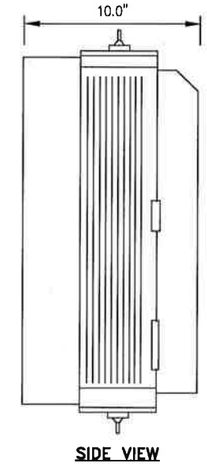
DUAL BAND ANTENNA	NO SCALE	3

RRH: ALCATEL LUCENT RRH 800 MHz 2x50W

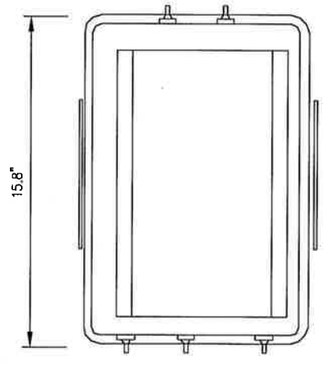
COLOR: LIGHT GREY
WEIGHT: 53 LBS.

NOTES

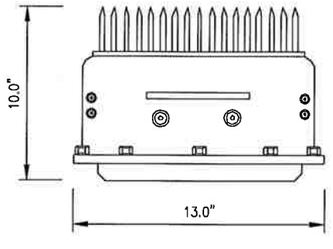
COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.



SIDE VIEW



FRONT VIEW



PLAN VIEW

800 MHz RRH	NO SCALE	4

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AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (516) 308-3740

ENGINEERING LICENSE:

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	05/22/18	ETC	0

SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-4

RFS HYBRIFLEX RISER CABLE SCHEDULE

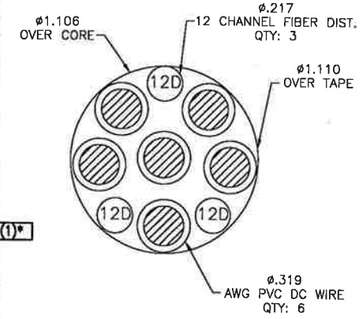
Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft (1)*
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

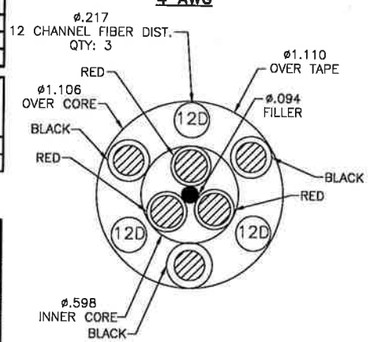
Fiber Only	Hybrid Jumper cable MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft
6 AWG Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft
4 AWG Power	Hybrid Jumper cable MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.

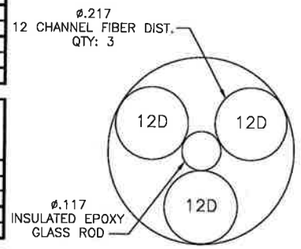
* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.



4 AWG

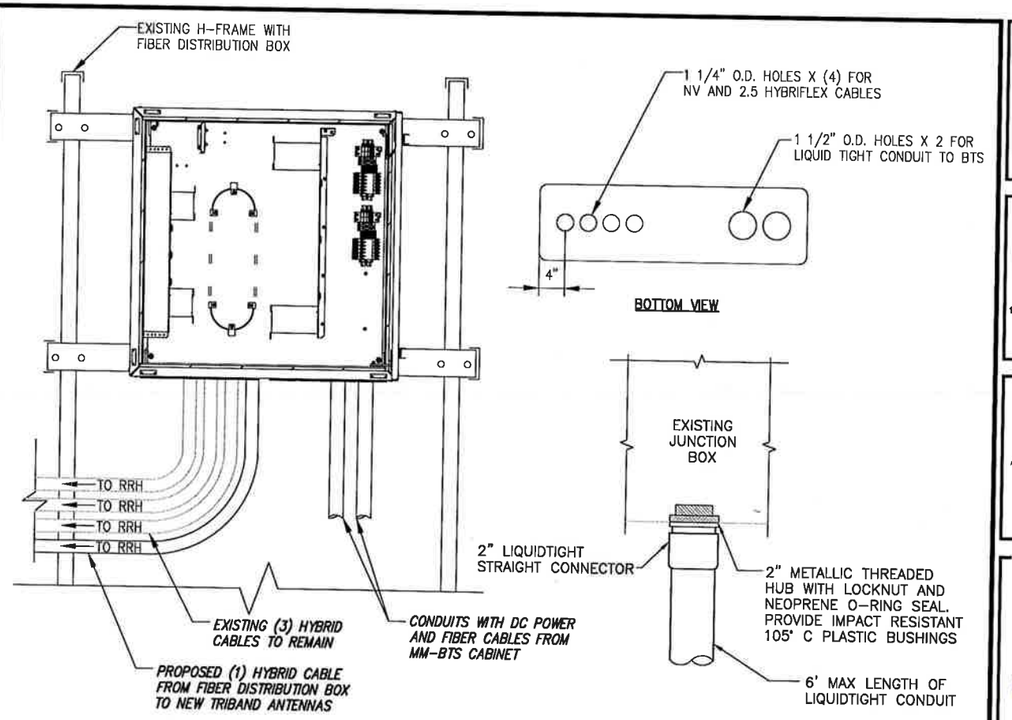


8 & 6 AWG



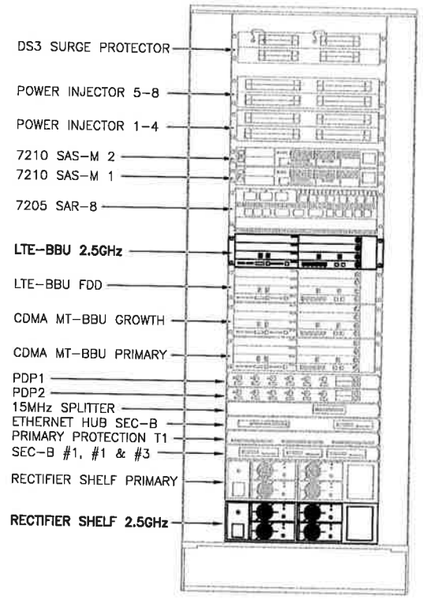
FIBER ONLY

800/1900/2500 CABLE CROSS SECTION DATA | NO SCALE | 1



FRONT VIEW

FIBER JUNCTION BOX & PENETRATION | NO SCALE | 2



FRONT VIEW

NEW EQUIPMENT IN EXISTING CABINET | NO SCALE | 3

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ENGINEERING LICENSE:


DRAWING NOTICE:

REVISIONS:

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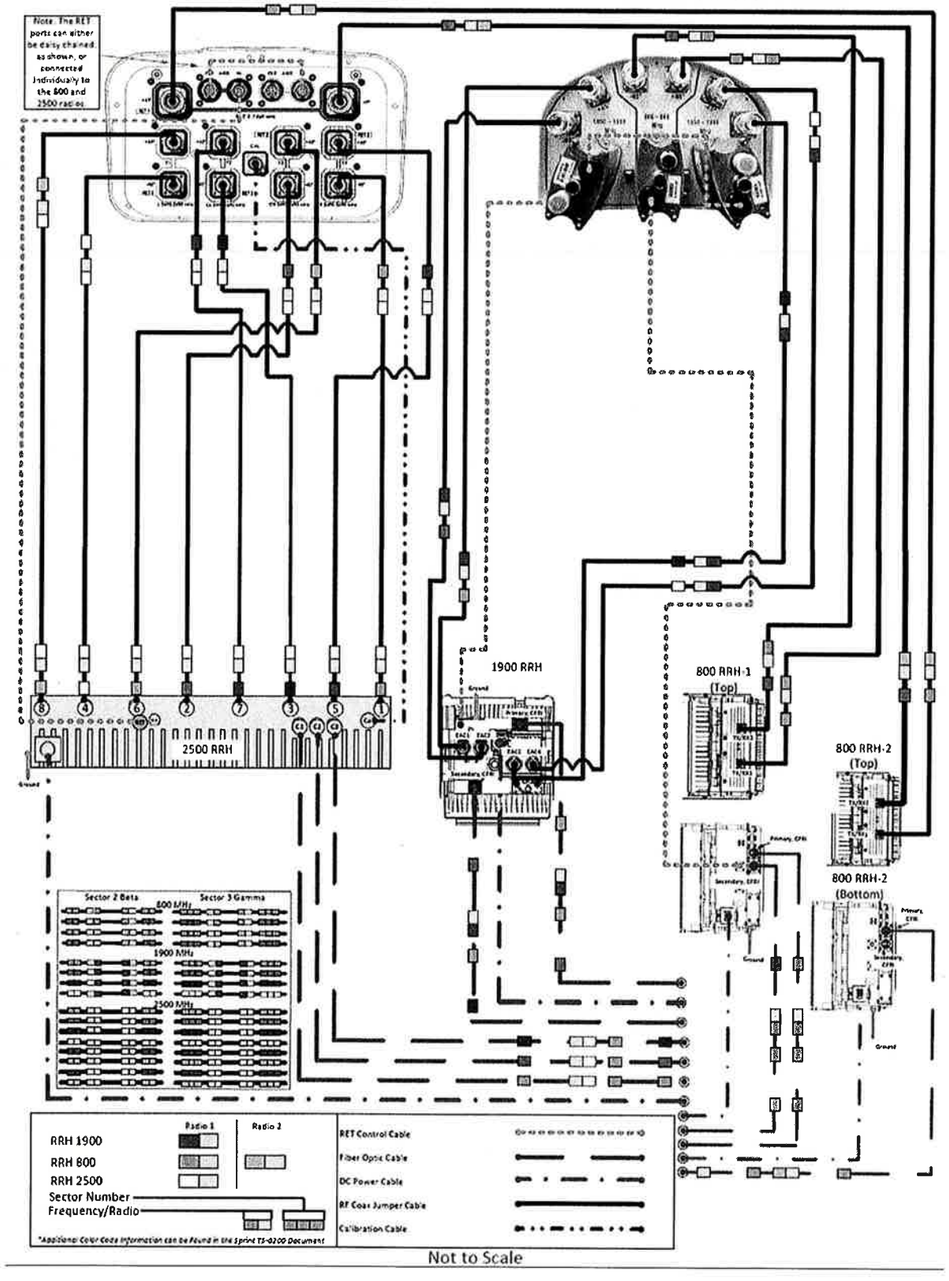
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
CIVIL DETAILS

SHEET NUMBER:
A-5

ALU 211 DT465B-2XR & APXVSPP18-C-A20 wo Filters



Not to Scale

PLUMBING DIAGRAM | NO SCALE | 1

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SITE ADDRESS:
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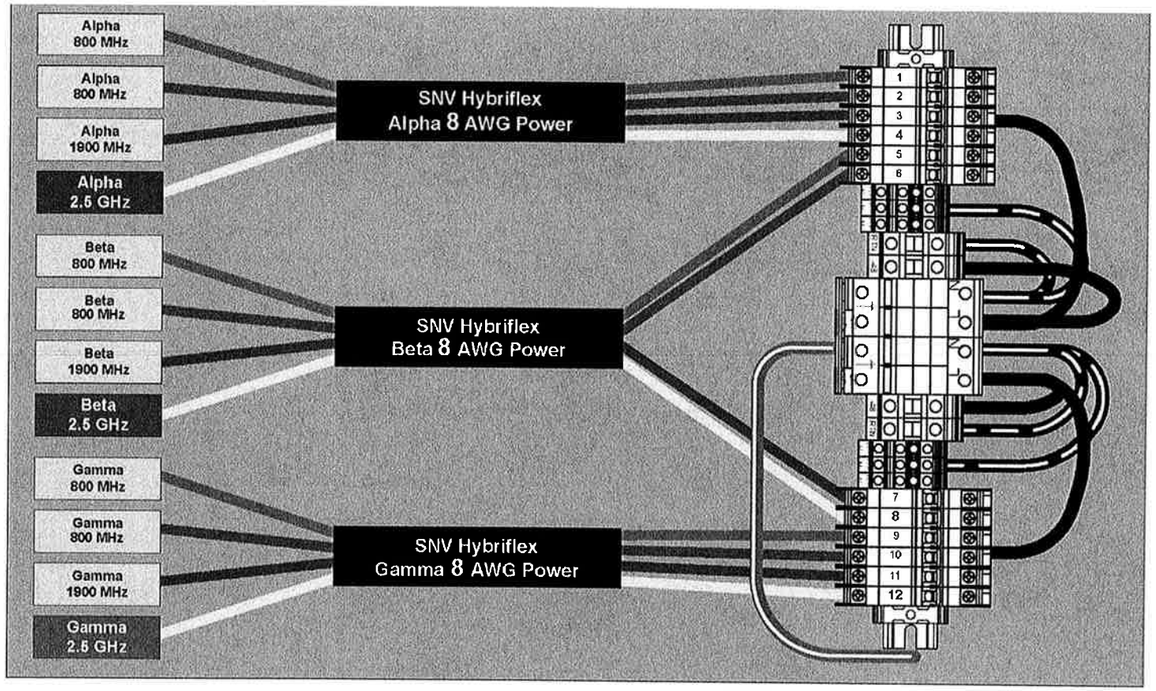
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
PLUMBING DIAGRAM

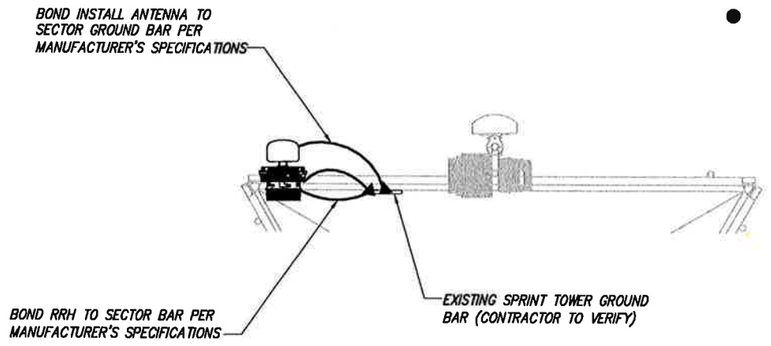
SHEET NUMBER:
A-6



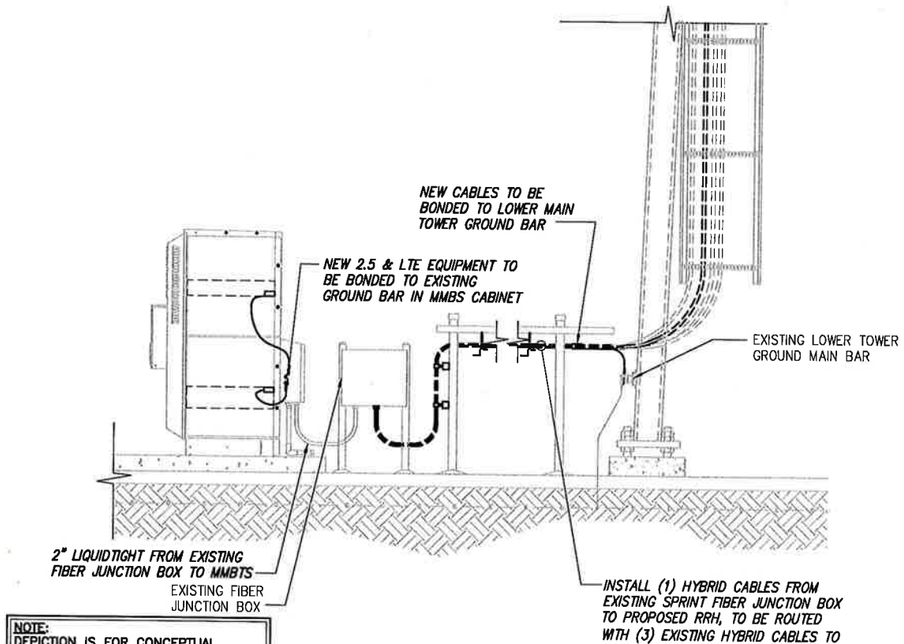
RRH TO DISTRIBUTION BOX POWER CONNECTIVITY | NO SCALE | 1

LEGEND:

- EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- MECHANICAL CONNECTION
- GROUND ROD
- CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



NOTE:
DEPICTION IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO FIELD VERIFY PRIOR TO CONSTRUCTION

TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION) | NO SCALE | 3

PLANS PREPARED FOR:
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PLANS PREPARED BY:
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Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

PROJECT MANAGER:
AIROSMITH DEVELOPMENT
32 CLINTON ST.
SARATOGA SPRINGS, NY 12866
OFFICE#. (518) 308-3740

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER
DEC 17 2018

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

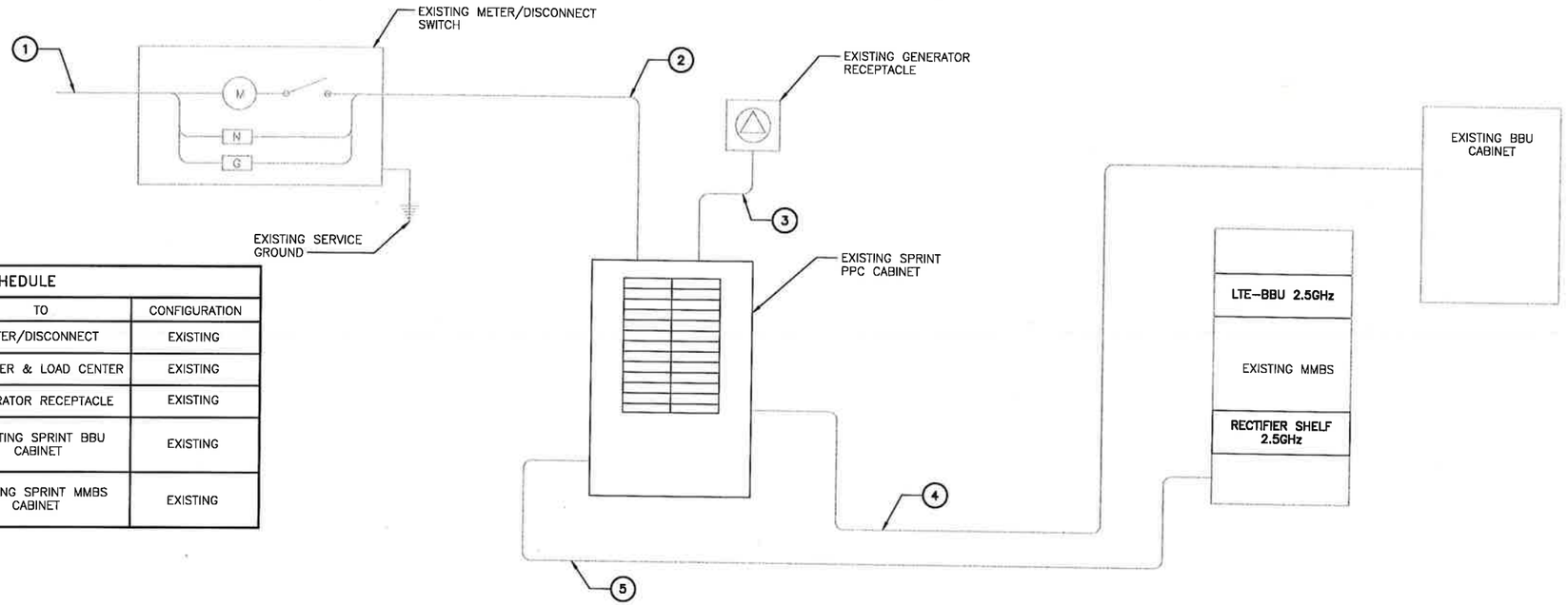
SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:
E-1

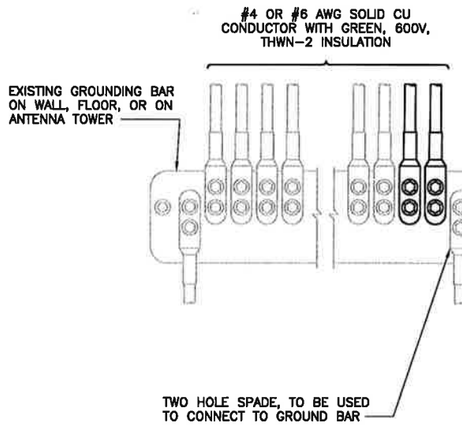
NOTES

CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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	EXISTING SPRINT BBU CABINET	EXISTING
5	TRANSFER & LOAD CENTER	EXISTING SPRINT MMBS CABINET	EXISTING

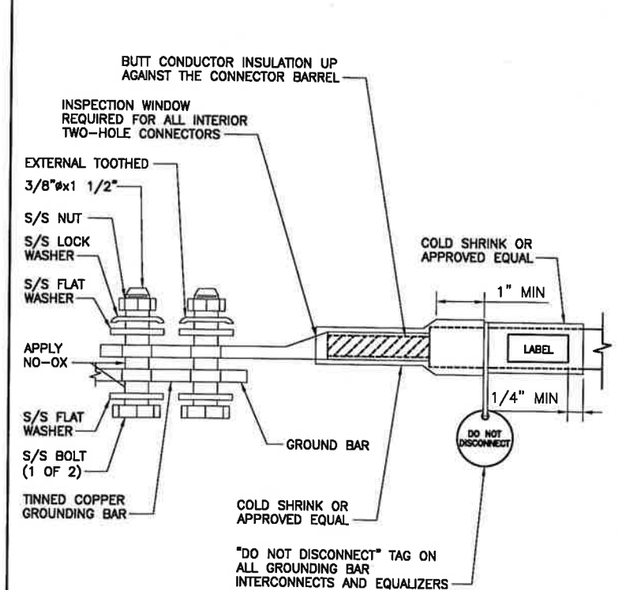
ELECTRICAL ONE–LINE DIAGRAM | NO SCALE | 1



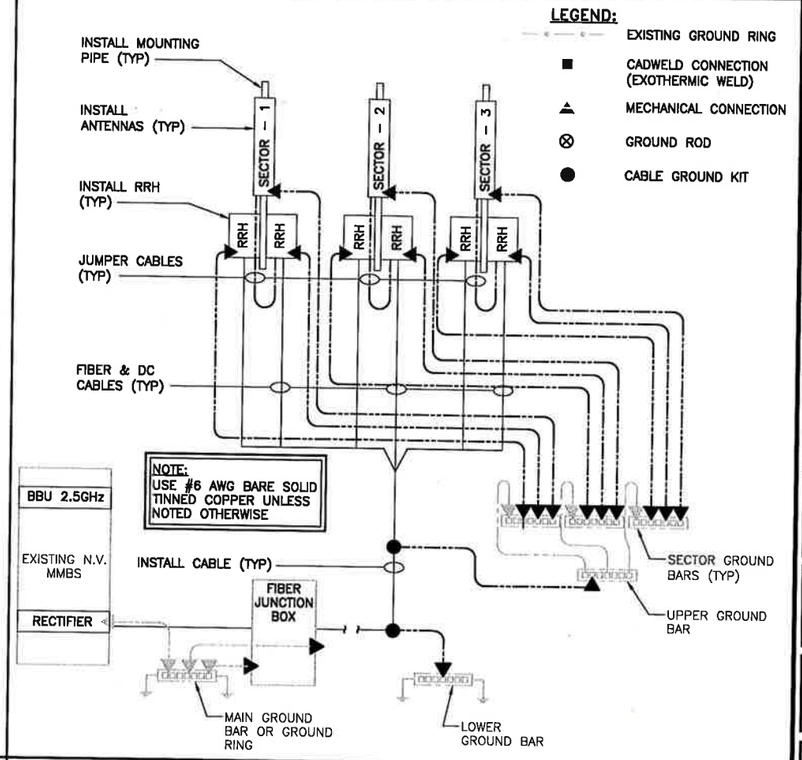
NOTES

1. APPLY NO–OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR | NO SCALE | 2



TWO HOLE LUG | NO SCALE | 3



LEGEND:

- EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- MECHANICAL CONNECTION
- GROUND ROD
- CABLE GROUND KIT

GROUNDING RISER DIAGRAM | NO SCALE | 4

PLANS PREPARED FOR:

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PLANS PREPARED BY:

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STATE OF CONNECTICUT · JOHN S. STEVENS · No. 24705 · LICENSED PROFESSIONAL ENGINEER · SEP 17 2018

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR PERMIT	06/22/18	ETC	0

SITE NAME:
(R2E) CT3677 TO CT03XC028 SOUTH ST/I-84 (POLICE TOWER)

SITE NUMBER:
CT03XC028

SITE ADDRESS:
SOUTH STREET / I-84
MIDDLEBURY, CT 06762

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:
E-2

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CONNECTICUT STATE BUILDING, SUPPLEMENTS AND AMENDMENTS AND LIFE SAFETY CODES.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND NOTES IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND NOTES FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING OPERATING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER. THERE SHALL BE NO INTERRUPTION OF OPERATION WITHOUT TIMELY COORDINATION WITH AND APPROVAL BY THE VARIOUS COMMUNICATIONS OPERATORS.
8. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
10. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
11. THE 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. SUBMIT ANY DISCREPANCIES FROM THE DRAWINGS TO THE ARCHITECT.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
14. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE DOCUMENTS ARE BASED ON ORIGINAL TOWER CONSTRUCTION DRAWINGS BY STAINLESS INC., DATED DECEMBER 1995, AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.

STRUCTURAL NOTES

STRUCTURAL STEEL MATERIAL:

STRUCTURAL STEEL BEAMS, CHANNELS, PLATES..... A36
STRUCTURAL ANGLES..... A36 & A529-50
EXISTING TOWER LEG ..... A 572-Gr. 50 & Gr. 60

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 5/8" DIA. A325-N BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

COMMENCEMENT OF WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN A WIND.

INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

OWNER WILL SUPPLY THE SERVICES OF A SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS WILL BE PROVIDED TO THE OWNER, BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.

Project No.:	ASM006/EMP008
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

Sprint AT&T

SITE ADDRESS: CSP #20, INTERSECTION OF I-84W & SOUTH ST
MIDDLEBURY, CONNECTICUT

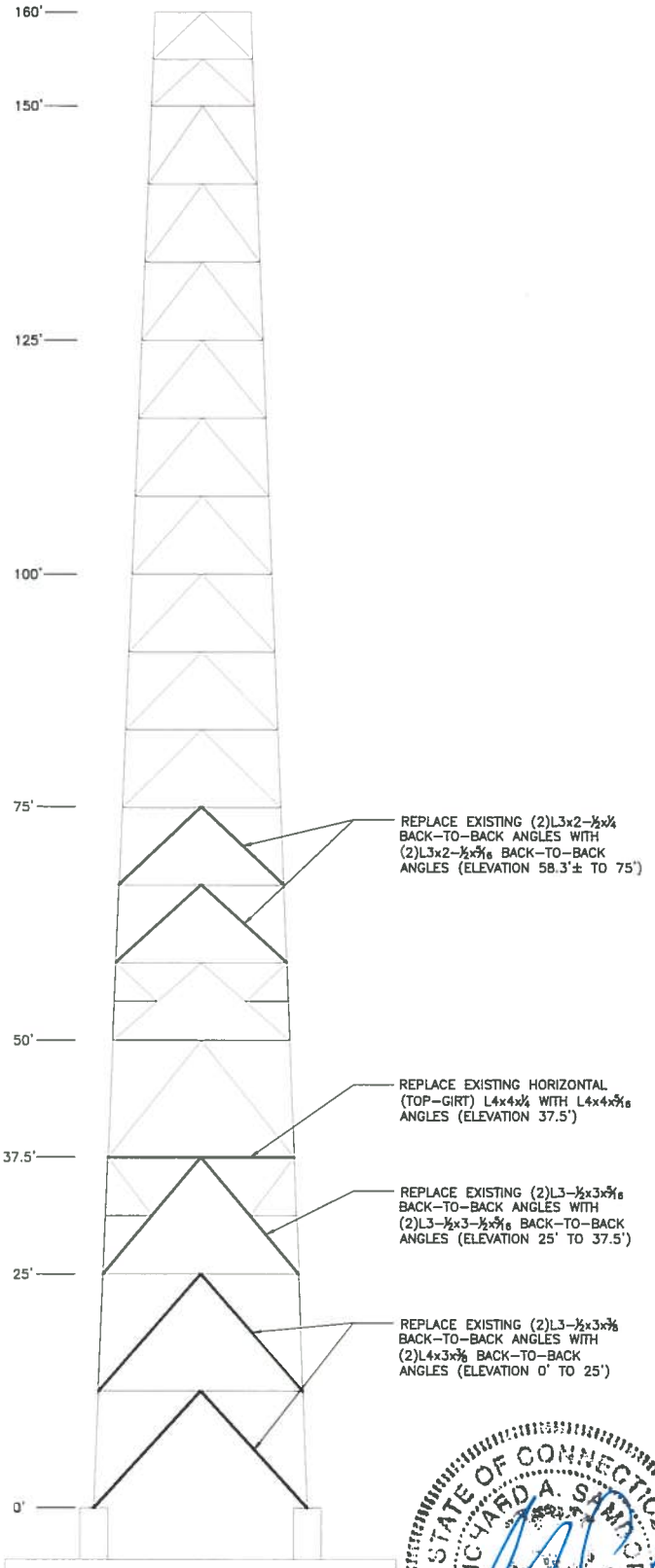
REV.	DATE:	DESCRIPTION

Scale: NONE | Date: 04/09/18
Job No. | File No.

Dwg. No. SK-1

Dwg. 1 of 2

NOTE:
1. REFER TO STRUCTURAL NOTES ON SK-1 FOR INFORMATION.
2. REINFORCEMENT OF TOWER IS REQUIRED FOR ALL 3 SIDES OF EXISTING TOWER STRUCTURE.
3. CONNECTION BOLTS THAT ARE REMOVED DURING MEMBER REPLACEMENT SHALL NOT BE RE-USED FOR CONNECTING REPLACEMENT MEMBERS.
4. CONTRACTOR SHALL VERIFY INFORMATION SHOWN ON THIS SHEET PRIOR TO ORDERING MATERIALS.
5. ANGLE MEMBER REPLACEMENT INDICATED ON THIS SHEET SHALL HAVE A MINIMUM YIELD STRESS OF 50 KSI UNLESS NOTED OTHERWISE.



1 / SK-4 **TOWER ELEVATION**
SCALE: 1" = 20'-0"

STATE OF CONNECTICUT ★ RICHARD A. SAMPSON ★ No. 20 LICENSED PROFESSIONAL ENGINEER

Project No.:	ASM006/EMP006
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

Sprint AT&T

SITE ADDRESS:
CSP #20, INTERSECTION OF I-84W & SOUTH ST
MIDDLEBURY, CONNECTICUT

REV.	DATE:	DESCRIPTION

Scale: | Date: 04/06/18
Job No.VZ5-190 | File No.

Dwg. No. SK-2