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

March 26, 2021

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

RE: **Notice of Exempt Modification for T-Mobile: 876392**
115 Industrial Park Rd, New Hartford, CT 06057
Latitude: 41° 53′ 10.48″ / Longitude: -72° 57′ 58.10″

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 166-foot mount level on the existing 168-foot monopole tower, located at 115 Industrial Park Road, New Hartford, CT. The property and tower are owned by Global Signal/Crown Castle. T-Mobile now intends to add three (3) new antennas and ancillary equipment at the 166-ft level. T-Mobile is to also to replace the antenna mount at the same level. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:
Tower:

Installed New:
(3) RFS/Celwave – APXVAARR24_43-U-NA20
(3) Ericsson-Radio 449 B12/B71
(1) HYBRID CABLE (1-5/8")
(1) Site Pro 1 RDS 284 T-Arm Mount

Remove:
(3) Sector Antenna Mounts

Ground:

Install New:
(1) BB 6630

The facility was approved by the Town of New Hartford Planning & Zoning Commission on August 9, 2000 via Gant of Special Exception.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to First Selectman, Mr. Daniel V. Jerram, Town of New Hartford, Zoning Enforcement Officer, Mr. Michael Lucas, Town of New Hartford. Global Signal/Crown Castle is the property & tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Jeffrey Barbadora
Site Acquisition Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

First Selectman, Mr. Daniel V. Jerram, 530 Main Street, New Hartford, CT 06057 (860)-379-3389 (*via email to djerram@newhartfordct.gov).*
Zoning Enforcement Officer, Mr. Michael Lucas, 530 Main Street, New Hartford, CT 06057 (860)-379-7677 (*via email to MLucus@town.new-hartford.ct.us).*
Property & Tower Owner, Global Signal/Crown Castle, 1800 W. Park Drive, Westborough, MA 01581

BROWN RUDNICK FREED & GESMER

FAX COVER SHEET

DATE: August 16, 2000

THIS TRANSMISSION CONSISTS OF THIS COVER SHEET AND 1 PAGE(S).

DELIVER TO:	COMPANY/FIRM:	FAX NUMBER:	PHONE NUMBER:
KAREN J. NIELSEN	SPRINT PCS	201/ 684-4070	(201) 684-4064
RICH FEELEY	ATLANTIC WESTERN CONSULTING, INC.	401/949-8096	401/949-1605

FROM: THOMAS J. REGAN

TELEPHONE: DIRECT DIAL: (860) 509-6522

OUR FACSIMILE NUMBER IS: (860) 509-6501.

80563/1916/825

MESSAGE	
New Hartford, CT (CT-FAXC5886-2)	Attached is a copy of the "*Notice of Decision*" as published in the Hartford Courant on Wednesday, August 16, 2000. The appeal period on this matter expires on 8/31/00, at which time the Notice will be recorded on the New Hartford Land Records.

IF YOU DO NOT RECEIVE ALL PAGES, PLEASE CALL (860) 509-6542 AND ASK FOR OFFICE SERVICES.

A PARTNERSHIP OF PROFESSIONAL CORPORATIONS

City Place I
185 Asylum Street
Hartford, CT
Tel:(860)509-6500
Fax:(860)509-6501

#5

Decision Published (New Hartford)

8/16/00

LEGAL PUBLIC NOTICES

NOTICE OF DECISIONS
TOWN OF NEW HARTFORD
PLANNING AND ZONING COMMISSION

The Planning and Zoning commission at a special meeting August 9th, 2000 at Berkshire Hall, Brodie Park, made the following decisions:

By unanimous vote, to approve the application of Mark & Holly Rapp, applicants/Allan Child, owner - 1 Lot Subdivision with a special exception for an interior lot in an RA Zone - Town Hill Road with one condition.

By unanimous vote, to approve the application of Sprint Spectrum L.P. D/B/A Sprint PCS applicant/ Executive Direction Inc., Owner - Special Exception for a telecommunications tower on Parcel ID #008-115 Industrial Park Access Road with Site Plan approval with 2 conditions.

Copies of the applications are on file in the office of the Planning and Zoning Commission at the New Hartford Town Hall, Brodie Park, West Hill Road, New Hartford.

Dated this 10th day of August, 2000 by
Planning and Zoning Commission
Chairman, David Kriemmel.

588

Town of New Hartford

530 MAIN STREET • TOWN HALL
NEW HARTFORD, CT 06057

(Rec'd 8/23/00 from BRF+E)

Appeal Period Expires 8/31/00

Cert to be recorded 9/1 (File for BP)

PLANNING AND ZONING COMMISSION
(860) 379-7577

August 14, 2000

Sprint Spectrum LP dba Sprint PCS, applicant
Executive Greetings, Inc., owner
9 Barnes Industrial Road
Wallingford, CT. 06492

Dear Sirs,

The Planning and Zoning Commission at a "Special" meeting, August 9, 2000 at Berkshire Hall, Brodie Park, made the following decision:

By unanimous approval, , that the application of Sprint Spectrum L.P. DBA Sprint PCS applicant/Executive Greetings Inc., Owner – Special Exception for a telecommunications tower in a IP zone – 115 Industrial Park Access Road be approved in the method described in the written and oral testimony of the applicant and its representative and according to the site plan supplied "Sprint PCS Wireless Communications Facility – CT33xC588, New Hartford, 115 Industrial Park Access Road, New Hartford, CT. prepared for Sprint Spectrum LP by Natcomm LLC, Branford, CT., dated 1/28/00, revised 2/24/00(issued for zoning) and 4/14/200(modified for wetlands commission and easement location) with the following conditions;

1. That the review comments of the Town Engineer (3/15/00 & 6/29/200), the Town Planner (7/7/2000), and the radio frequency engineer (7/12/00 & 8/9/00) shall be incorporated into the plans with final determination for compliance by the Zoning Enforcement Officer.
2. Soil testing (as provided for in the regulations) shall be furnished prior to the issuance of a building permit.
3. That the maximum 160 foot high monopole telecommunications tower be designed and constructed to allow additional co-locators.

The special exception for the telecommunications tower is approved according to the standards and criteria as set forth in Article VI, Antennas, Towers, and Wireless Communications Facilities of the Town of New Hartford Zoning Regulations and all of the above conditions as relating to special exception shall be in addition to the pertinent standards and criteria of Article V, Section 2. "General Standards and Requirements.

Enclosed please find a **GRANT OF SPECIAL EXCEPTION** that corresponds with your approval. This Grant of Special Exception should be filed in the Town Clerk's Office at your earliest convenience. This filing ensures that your permit is made a permanent record on the land records in the Town of New Hartford. A $18.00 fee payable to the Town of New Hartford is due upon filing of the permit.

Please contact Karl Nilsen, ZEO, in New Hartford Town Hall if you have any questions concerning this matter.

Respectfully yours,

David Krimmel, Chairman
Planning and Zoning Commission

DK/kgn

CT33xC588

BOOK 186 PAGE 0899

000344

TOWN OF NEW HARTFORD
GRANT OF SPECIAL EXCEPTION

On the application of

Sprint Spectrum LP dba Sprint PCS applicant
Executive Greetings Inc, owner
9 Barnes Industrial Road
Wallingford, CT. 06492

the **PLANNING AND ZONING COMMISSION**

did grant a _____ Special Permit

____XXX___ **Special Exception for a telecommunications tower in a IP zone**

Street address: 115 Industrial Park Road
Description of Premises:
Assessor's Aerial Map 038
Block 134 Lot 15C
Volume 145 page 451
Owners of record: Executive Greetings Inc.

The application of **Sprint Spectrum L.P. DBA Sprint PCS applicant/Executive Greetings Inc., Owner – Special Exception for a telecommunications tower in a IP zone – 115 Industrial Park Access Road** is approved in the method described in the written and oral testimony of the applicant and its representative and according to the site plan supplied "Sprint PCS Wireless Communications Facility – CT33xC588, New Hartford, 115 Industrial Park Access Road, New Hartford, CT. prepared for Sprint Spectrum LP by Natcomm LLC. Branford, CT., dated 1/28/00, revised 2/24/00(issued for zoning) and 4/14/200(modified for wetlands commission and easement location) with the following conditions;

1. That the review comments of the Town Engineer (3/15/00 & 6/29/200), the Town Planner (7/7/2000), and the radio frequency engineer (7/12/00 & 8/9/00) shall be incorporated into the plans with final determination for compliance by the Zoning Enforcement Officer.
2. Soil testing (as provided for in the regulations) shall be furnished prior to the issuance of a building permit.
3. That the maximum 160 foot high monopole telecommunications tower be designed and constructed to allow additional co-locators.

The special exception for the telecommunications tower is approved according to the standards and criteria as set forth in Article VI, Antennas, Towers, and Wireless Communications Facilities of the Town of New Hartford Zoning Regulations and all of the above conditions as relating to special exception shall be in addition to the pertinent standards and criteria of Article V, Section 2. "General Standards and Requirements.

Certified this 10th day of August, 2000
By David Krimmel (KCW)
David Krimmel, Chairman
Planning and Zoning Commission

Received September 1, 2000
At 10:10 A M
Recorded in New Hartford Land
Records Vol 186 Page 899-900
Town Clerk

AFTER RECORDING, PLEASE RETURN TO:
Thomas J. Regan, Esquire
Brown Rudnick Freed & Gesmer
185 Asylum Street, 38th Floor
Hartford, CT 06103-3402

TOWN OF NEW HARTFORD

530 MAIN STREET- TOWN HALL
NEW HARTFORD, CT. 06057

INLAND WETLANDS COMMISSION
(860-379-8830)

April 26, 2000

Sprint Spectrum LP.
9 Barnes Industrial Road
Wallingford, CT. 06492

To whom it may concern:

The Inland Wetlands Commission, at its regular meeting at Berkshire Hall, Brodie Park, on April 24th, 2000, made the following decision:

By a majority vote, to approve the application of **Sprint Spectrum LP., applicant/ Executive Greetings, owner - Crossing of an intermittent watercourse for the construction of a telecommunications tower - 120 Industrial Park Access Road** as presented as the method described in the written and oral testimony of the applicant and according to the revised site plan provided as the method shows that there will no adverse effects to the watercourse or wetlands on the property.
Feasible and prudent alternatives were explored and the commission's approval is based on the belief that the revised application as presented is the most reasonable and prudent available. As part of the permit granted, proper soil and erosion controls must be in place prior to the start of any construction and those controls are to inspected and approved by the Inland Wetlands Enforcement Officer prior to and during all phases of construction

Any information or assistance required concerning this decision should be directed to Mr. Paul Volovski, Inland Wetlands Enforcement officer at 379-8830 during regular Town Hall business hours.

Respectfully yours,
Alden Ringklib
Alden Ringklib, Chairman
Inland Wetlands Commission

AR/kgn
Cc/Thomas J Regan, Brown Rudnick Freed & Gesmer

Town of New Hartford, CT

Property Listing Report

Map Block Lot	038-134-15C	Bldg #	1	Sec #	1	PID	184722	Account	00284401

Property Information

Property Location	115 INDUSTRIAL PARK ROAD
Owner	FRAMINGHAM COMMONS LLC
Co-Owner	C/O GLOBAL SIGNAL ACQUISITION PMB 331
Mailing Address	4017 WASHINGTON ROAD MCMURRAY PA 15317
Land Use	4400 IND VACANT
Land Class	I
Zoning Code	IP
Census Tract	3061/1002

Neighborhood	C
Acreage	0.4
Utilities	Well,Septic
Lot Setting/Desc	Rural Level
Book / Page	0234/0515
Fire District	1

Photo

Sketch

Primary Construction Details

Year Built	0
Building Desc.	IND VACANT
Building Style	UNKNOWN
Building Grade	
Stories	
Occupancy	
Exterior Walls	
Exterior Walls 2	NA
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	NA
Interior Floors 1	
Interior Floors 2	NA

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	NA
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Gar	
Fireplaces	

(*Industrial / Commercial Details)

Building Use	Vacant
Building Condition	
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	NA

Report Created On 3/25/2021

Town of New Hartford, CT

Property Listing Report

Map Block Lot	038-134-15C	Bldg #	1	Sec #	1	PID	184722	Account	00284401

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements		
Outbuildings	98700	69090
Land	324000	226800
Total	422700	295890

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	0	0

Outbuilding and Extra Features

Type	Description
Pre Cast Cell	300 S.F.
Pre Cast Cell	240 S.F.
Fence-8' Chain	400 L.F.

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
FRAMINGHAM COMMONS LLC	0234/0515	2005-05-10	0

Report Created On 3/25/2021

Barbadora, Jeff

From: Barbadora, Jeff
Sent: Friday, March 26, 2021 12:20 PM
To: djerram@newhartfordct.gov
Subject: 115 Industrial Park Road, New Hartford, CT - Exempt Modification _ T-Mobile - 876392
Attachments: 876392_115 Industrial Park Road_T_Mobile_Exempt_Modification_JDX_Copy.pdf

Good Afternoon Mr. Jerram,

Attached please find T-Mobile's exempt modification application package that is being sent to the Connecticut Siting Council today.

The Council has advised that electronic notifications of such filing are acceptable at this time.

Please let me know if you have any question.

Thanks,

Jeffrey Barbadora
Site Acquisition Specialist
781-970-0053

Crown Castle
1800 W. Park Drive
Westborough, MA 01581

Barbadora, Jeff

From: Barbadora, Jeff
Sent: Friday, March 26, 2021 12:20 PM
To: MLucas@town.new-hartford.ct.us
Subject: 115 Industrial Park Road, New Hartford, CT - Exempt Modification _ T-Mobile - 876392
Attachments: 876392_115 Industrial Park Road_T_Mobile_Exempt_Modification_JDX_Copy.pdf

Good Afternoon Mr. Lucas,

Attached please find T-Mobile's exempt modification application package that is being sent to the Connecticut Siting Council today.

The Council has advised that electronic notifications of such filing are acceptable at this time.

Please let me know if you have any question.

Thanks,

Jeffrey Barbadora
Site Acquisition Specialist
781-970-0053

Crown Castle
1800 W. Park Drive
Westborough, MA 01581

Date: **December 10, 2020**

Denice Nicholson
Crown Castle
3 Corporate Dr
Clifton Park, NY 12065

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTNH414A
	Carrier Site Name:	Litchfield 10
Crown Castle Designation:	**Crown Castle BU Number:**	876392
	Crown Castle Site Name:	NEW HARTFORD / EXECUTIVE GREET
	Crown Castle JDE Job Number:	559339
	Crown Castle Work Order Number:	1902062
	Crown Castle Order Number:	479857 Rev. 4
Engineering Firm Designation:	**Crown Castle Project Number:**	1902062
Site Data:	**115 INDUSTRIAL PARK RD, NEW HARTFORD, Litchfield County, CT** **Latitude *41° 53' 10.48"*, Longitude *-72° 57' 58.1"*** **168 Foot - Monopole Tower**	

Dear Denice Nicholson,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC7: Proposed Equipment Configuration ***Sufficient Capacity - 99.9%**

***The structure has sufficient capacity once the loading changes, described in the Recommendations section of this report, are completed.**

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

Structural analysis prepared by: Patrick Himes

Respectfully submitted by:

Maribel Dentinger

Maribel Dentinger, P.E.
Senior Project Engineer

Maribel Dentinger Digitally signed by Maribel Dentinger Date: 2020.12.10 20:35:05 -05'00'

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Table 1 - Proposed Equipment Configuration
Table 2 - Other Considered Equipment

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tnxTower Output

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7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 168 ft Monopole tower designed by Summit. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
166.0	166.0	3	ericsson	KRY 112 144/1	13	1-5/8
		3	ericsson	KRY 112 489/2		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
		1	newave	FSK-126-X22		
		3	sitepro1	RDS-284 T-Arm Mounts		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
157.0	157.0	3	alcatel lucent	RRH2X50-800	3 1	1-1/4 5/8
		3	alcatel lucent	TD-RRH8X20-25		
		3	commscope	DT465B-2XR w/ Mount Pipe		
		9	rfs celwave	ACU-A20-N		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 712-1]		
155.0	156.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	-	-
		3	alcatel lucent	800MHZ RRH		
	155.0	1	tower mounts	Side Arm Mount [SO 102-3]		
	154.0	3	alcatel lucent	1900MHz RRH (65MHz) w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145.0	147.0	3	antel	BXA-171085-12BF-2 w/ Mount Pipe	12	1-5/8
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe		
		6	antel	LPA-80080/6CF w/ Mount Pipe		
		6	rfs celwave	FD9R6004/2C-3L		
	145.0	1	tower mounts	Platform Mount [LP 403-1]		
120.0	120.0	3	ericsson	RRUS 11	-	-
		1	tower mounts	Side Arm Mount [SO 102-3]		
118.0	119.0	2	andrew	SBNHH-1D65A w/ Mount Pipe	12 2 1	1-5/8 7/16 3/8
		1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe		
		3	ericsson	RRUS 4415 B25		
		1	kathrein	800 10764 w/ Mount Pipe		
		1	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe		
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		6	powerwave technologies	7020.00		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		12	powerwave technologies	LGP2140X		
		1	raycap	DC6-48-60-18-8F		
	118.0	1	tower mounts	Platform Mount [LP 303-1]		
74.0	75.0	1	lucent	KS24019-L112A	1	1/2
	74.0	1	tower mounts	Side Arm Mount [SO 702-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Criscuolo Shepard Associates	1532994	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit / Paul J. Ford	1616556	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit / Paul J. Ford	1441325	CCISITES
4-POST-MODIFICATION INSPECTION	GPD	2808249	CCISITES
4-POST-MODIFICATION INSPECTION	TEP	3839078	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD	3027354	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford	3375536	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	168 - 158	Pole	TP14x14x0.25	1	-1.66	357.18	23.0	Pass
L2	158 - 116.5	Pole	TP29.139x22x0.1875	2	-9.26	1034.76	80.9	Pass
L3	116.5 - 80.25	Pole	TP35x28.119x0.25	3	-18.28	1656.01	99.9	Pass
L4	80.25 - 39.75	Pole	TP41.467x33.726x0.3125	4	-30.14	2452.35	99.8	Pass
L5	39.75 - 0	Pole	TP47.68x39.939x0.375	5	-48.36	3458.52	93.5	Pass
							Summary	
						Pole (L3)	99.9	Pass
						Rating =	99.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	158	25.4	Pass
1	Flange Plate	158	60.2	Pass
1	Anchor Rods	0	72.5	Pass
1	Base Plate	0	79.8	Pass
1	Base Foundation Structural	0	62.5	Pass
1	Base Foundation Soil Interaction	0	62.6	Pass

Structure Rating (max from all components) =	99.9%

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

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. In order for the results of this analysis to be considered valid, the loading modification, as follows, must be completed.

Loading Changes:

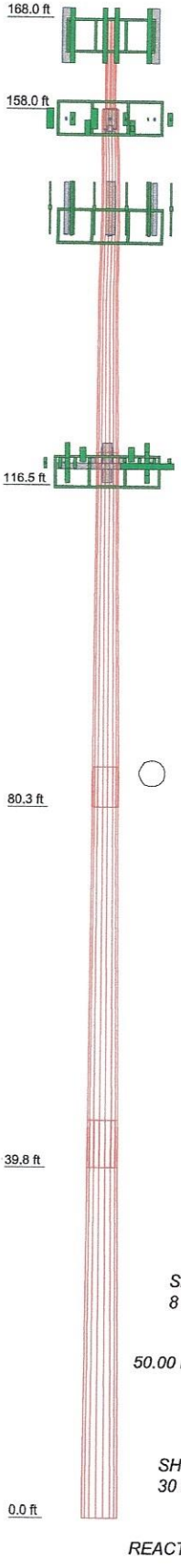
a) The (3) antennas, pipe mounts, and (6) 1-5/8" external coax to the 102ft elevation shall be removed.

No structural modifications are required at this time provided that the above-listed changes are completed.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5
Length (ft)	10.0000	41.5000	40.0000	45.0000	45.0000
Number of Sides	0	18	18	18	18
Thickness (in)	0.2500	0.1875	0.2500	0.3125	0.3750
Socket Length (ft)		3.7500	4.5000	5.2500	
Top Dia (in)	14.0000	22.0000	28.1190	33.7260	39.9390
Bot Dia (in)	14.0000	29.1390	35.0000	41.4670	47.6800
Grade	A53-B-35			A607-65	
Weight (K)	0.4	2.1	3.4	5.7	7.9



ALL REACTIONS ARE FACTORED

AXIAL 92 K
SHEAR 8 K
MOMENT 1126 kip-ft
TORQUE 0 kip-ft
50.00 mph WIND - 2.0000 in ICE

AXIAL 48 K
SHEAR 30 K
MOMENT 3626 kip-ft
TORQUE 1 kip-ft
REACTIONS - 120.00 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120.00 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.00 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 99.9%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: **BU# 876392**			
Project:			
Client: Crown Castle	Drawn by: phimes	App'd:	
Code: TIA-222-H	Date: 12/10/20	Scale: NTS	
Path: C:\Users\phimes\Desktop\Work Area\876392\WO 1902062 - SA\Prod\876392.eri		Dwg No. E-1	

Tower Input Data

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

3) Tower is located in Litchfield County, Connecticut.
4) Tower base elevation above sea level: 567.0000 ft.
5) Basic wind speed of 120.00 mph.
6) Risk Category II.
7) Exposure Category C.
8) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
9) Topographic Category: 1.
10) Crest Height: 0.0000 ft.
11) Nominal ice thickness of 2.0000 in.
12) Ice thickness is considered to increase with height.
13) Ice density of 56.00 pcf.
14) A wind speed of 50.00 mph is used in combination with ice.
15) Temperature drop of 50.00 °F.
16) Deflections calculated using a wind speed of 60.00 mph.
17) TIA-222-H Annex S.
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in pole design is 1.05.
21) Tower analysis based on target reliabilities in accordance with Annex S.
22) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
23) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	168.0000-158.0000	10.0000	0.00	Round	14.0000	14.0000	0.2500		A53-B-35 (35 ksi)
L2	158.0000-116.5000	41.5000	3.75	18	22.0000	29.1390	0.1875	0.7500	A607-65 (65 ksi)
L3	116.5000-80.2500	40.0000	4.50	18	28.1190	35.0000	0.2500	1.0000	A607-65 (65 ksi)
L4	80.2500-39.7500	45.0000	5.25	18	33.7260	41.4670	0.3125	1.2500	A607-65 (65 ksi)
L5	39.7500-0.0000	45.0000		18	39.9390	47.6800	0.3750	1.5000	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.0000	10.7992	255.3004	4.8622	7.0000	36.4715	510.6008	5.3964	0.0000	0
	14.0000	10.7992	255.3004	4.8622	7.0000	36.4715	510.6008	5.3964	0.0000	0
L2	22.3105	12.9812	780.3007	7.7434	11.1760	69.8193	1561.6281	6.4918	3.5420	18.891
	29.5596	17.2298	1824.5630	10.2778	14.8026	123.2595	3651.5267	8.6165	4.7985	25.592
L3	29.1693	22.1141	2169.9441	9.8935	14.2845	151.9095	4342.7434	11.0591	4.5089	18.036
	35.5014	27.5741	4206.7704	12.3363	17.7800	236.6013	8419.0762	13.7897	5.7200	22.88
L4	34.9841	33.1420	4674.7706	11.8618	17.1328	272.8549	9355.6924	16.5742	5.3858	17.234
	42.0585	40.8201	8734.6676	14.6098	21.0652	414.6485	17480.8285	20.4139	6.7482	21.594
L5	41.4143	47.0911	9312.7130	14.0452	20.2890	459.0028	18637.6799	23.5500	6.3693	16.985
	48.3577	56.3048	15918.3035	16.7933	24.2214	657.1989	31857.5527	28.1577	7.7317	20.618

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 168.0000-158.0000				1	1	1			
L2 158.0000-116.5000				1	1	1			
L3 116.5000-80.2500				1	1	1			
L4 80.2500-39.7500				1	1	1			
L5 39.7500-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
561(1-5/8)	B	No	Surface Ar (CaAa)	166.0000 - 0.0000	13	6	-0.333 -0.125	1.6250		1.35
***										
****										
MS-650 (W)	B	No	Surface Af (CaAa)	30.5000 - 0.0000	1	1	0.000 0.000	6.5000	16.0000	27.65
MS-650 (W)	A	No	Surface Af	30.5000 -	1	1	0.000	6.5000	16.0000	27.65

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
			(CaAa)	0.0000			0.000			
MS-650 (W)	C	No	Surface Af	30.5000 - 5.5000	1	1	0.000 0.000	6.5000	16.0000	27.65
MS-600 (W)	C	No	(CaAa) Surface Af	55.7500 - 25.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-600 (W)	B	No	(CaAa) Surface Af	55.7500 - 25.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-600 (W)	A	No	(CaAa) Surface Af	55.7500 - 25.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-600 (W)	C	No	(CaAa) Surface Af	71.7500 - 51.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-600 (W)	B	No	(CaAa) Surface Af	71.7500 - 51.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-600 (W)	A	No	(CaAa) Surface Af	71.7500 - 51.7500	1	1	0.000 0.000	6.0000	14.0000	20.42
MS-450 (L)	C	No	(CaAa) Surface Af	93.0000 - 83.0000	1	1	0.000 0.000	4.5000	11.0000	15.31
MS-450 (L)	B	No	(CaAa) Surface Af	93.0000 - 83.0000	1	1	0.000 0.000	4.5000	11.0000	15.31
MS-450 (L)	A	No	(CaAa) Surface Af	93.0000 - 83.0000	1	1	0.000 0.000	4.5000	11.0000	15.31
**										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***									
HB114-1-0813U4-M5J(1 1/4")	C	No	No	Inside Pole	157.0000 - 0.0000	3	No Ice	0.0000	1.20
							1/2" Ice	0.0000	1.20
							1" Ice	0.0000	1.20
							2" Ice	0.0000	1.20
HB058-M12-XXXF(5/8")	C	No	No	Inside Pole	157.0000 - 0.0000	1	No Ice	0.0000	0.24
							1/2" Ice	0.0000	0.24
							1" Ice	0.0000	0.24
							2" Ice	0.0000	0.24
***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	145.0000 - 0.0000	12	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	118.0000 - 0.0000	12	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	118.0000 - 0.0000	1	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06
							1" Ice	0.0000	0.06
							2" Ice	0.0000	0.06
WR-VG122ST-BRDA(7/16)	C	No	No	Inside Pole	118.0000 - 0.0000	2	No Ice	0.0000	0.14
							1/2" Ice	0.0000	0.14
							1" Ice	0.0000	0.14
							2" Ice	0.0000	0.14
2" (Nominal) Conduit	C	No	No	Inside Pole	118.0000 - 0.0000	1	No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
							2" Ice	0.0000	0.72
***									
LDF4-50A(1/2")	C	No	No	Inside Pole	74.0000 - 0.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.15
							1" Ice	0.0000	0.15
							2" Ice	0.0000	0.15

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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	168.0000-158.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	7.800	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
L2	158.0000-116.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	40.462	0.000	0.73
		C	0.000	0.000	0.000	0.000	0.45
L3	116.5000-80.2500	A	0.000	0.000	7.500	0.000	0.15
		B	0.000	0.000	42.844	0.000	0.79
		C	0.000	0.000	7.500	0.000	1.04
L4	80.2500-39.7500	A	0.000	0.000	36.000	0.000	0.74
		B	0.000	0.000	75.487	0.000	1.45
		C	0.000	0.000	36.000	0.000	1.74
L5	39.7500-0.0000	A	0.000	0.000	47.042	0.000	1.13
		B	0.000	0.000	85.798	0.000	1.83
		C	0.000	0.000	41.083	0.000	1.96

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	168.0000-158.0000	A	1.994	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	13.739	0.000	0.37
		C		0.000	0.000	0.000	0.000	0.00
L2	158.0000-116.5000	A	1.959	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	70.906	0.000	1.89
		C		0.000	0.000	0.000	0.000	0.45
L3	116.5000-80.2500	A	1.895	0.000	0.000	9.695	0.000	0.29
		B		0.000	0.000	71.630	0.000	1.94
		C		0.000	0.000	9.695	0.000	1.18
L4	80.2500-39.7500	A	1.804	0.000	0.000	49.647	0.000	1.30
		B		0.000	0.000	118.197	0.000	3.10
		C		0.000	0.000	49.647	0.000	2.30
L5	39.7500-0.0000	A	1.618	0.000	0.000	63.097	0.000	1.82
		B		0.000	0.000	129.469	0.000	3.54
		C		0.000	0.000	55.154	0.000	2.57

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	168.0000-158.0000	2.6726	-4.1948	1.8658	-2.9284
L2	158.0000-116.5000	3.1241	-4.9034	2.5943	-4.0719
L3	116.5000-80.2500	2.7025	-4.2418	2.4753	-3.8851
L4	80.2500-39.7500	1.8758	-2.9442	1.8996	-2.9815
L5	39.7500-0.0000	1.8113	-3.3567	1.8843	-3.3735

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	561(1-5/8)	158.00 - 166.00	1.0000	1.0000
L2	2	561(1-5/8)	116.50 - 158.00	1.0000	1.0000
L3	2	561(1-5/8)	80.25 - 116.50	1.0000	1.0000
L3	27	MS-450 (L)	83.00 - 93.00	1.0000	1.0000
L3	28	MS-450 (L)	83.00 - 93.00	1.0000	1.0000
L3	29	MS-450 (L)	83.00 - 93.00	1.0000	1.0000
L4	2	561(1-5/8)	39.75 - 80.25	1.0000	1.0000
L4	21	MS-600 (W)	39.75 - 55.75	1.0000	1.0000
L4	22	MS-600 (W)	39.75 - 55.75	1.0000	1.0000
L4	23	MS-600 (W)	39.75 - 55.75	1.0000	1.0000
L4	24	MS-600 (W)	51.75 - 71.75	1.0000	1.0000
L4	25	MS-600 (W)	51.75 - 71.75	1.0000	1.0000
L4	26	MS-600 (W)	51.75 - 71.75	1.0000	1.0000
L5	2	561(1-5/8)	0.00 - 39.75	1.0000	1.0000
L5	18	MS-650 (W)	0.00 - 30.50	1.0000	1.0000
L5	19	MS-650 (W)	0.00 - 30.50	1.0000	1.0000
L5	20	MS-650 (W)	5.50 - 30.50	1.0000	1.0000
L5	21	MS-600 (W)	25.75 - 39.75	1.0000	1.0000
L5	22	MS-600 (W)	25.75 - 39.75	1.0000	1.0000
L5	23	MS-600 (W)	25.75 - 39.75	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L3	27	MS-450 (L)	83.00 - 93.00	Auto	0.0000
L3	28	MS-450 (L)	83.00 - 93.00	Auto	0.0000
L3	29	MS-450 (L)	83.00 - 93.00	Auto	0.0000
L4	21	MS-600 (W)	39.75 - 55.75	Auto	0.0000
L4	22	MS-600 (W)	39.75 - 55.75	Auto	0.0000
L4	23	MS-600 (W)	39.75 - 55.75	Auto	0.0000
L4	24	MS-600 (W)	51.75 - 71.75	Auto	0.0067
L4	25	MS-600 (W)	51.75 - 71.75	Auto	0.0067
L4	26	MS-600 (W)	51.75 - 71.75	Auto	0.0067
L5	18	MS-650 (W)	0.00 - 30.50	Auto	0.0000
L5	19	MS-650 (W)	0.00 - 30.50	Auto	0.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L5	20	MS-650 (W)	5.50 - 30.50	Auto	0.0000
L5	21	MS-600 (W)	25.75 - 39.75	Auto	0.0000
L5	22	MS-600 (W)	25.75 - 39.75	Auto	0.0000
L5	23	MS-600 (W)	25.75 - 39.75	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8x4'	C	None		0.0000	170.0000	No Ice	0.2500	0.2500	0.03
						1/2" Ice	0.6635	0.6635	0.03
						1" Ice	0.9732	0.9732	0.04
						2" Ice	1.4936	1.4936	0.06
**********									
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	14.6900	6.8700	0.18
						1/2" Ice	15.4600	7.5500	0.31
						1" Ice	16.2300	8.2500	0.45
						2" Ice	17.8200	9.6700	0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	14.6900	6.8700	0.18
						1/2" Ice	15.4600	7.5500	0.31
						1" Ice	16.2300	8.2500	0.45
						2" Ice	17.8200	9.6700	0.78
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	14.6900	6.8700	0.18
						1/2" Ice	15.4600	7.5500	0.31
						1" Ice	16.2300	8.2500	0.45
						2" Ice	17.8200	9.6700	0.78
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	6.2900	2.7600	0.06
						1/2" Ice	6.8600	3.2700	0.11
						1" Ice	7.4500	3.7900	0.16
						2" Ice	8.6800	4.9000	0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	6.2900	2.7600	0.06
						1/2" Ice	6.8600	3.2700	0.11
						1" Ice	7.4500	3.7900	0.16
						2" Ice	8.6800	4.9000	0.29
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	6.2900	2.7600	0.06
						1/2" Ice	6.8600	3.2700	0.11
						1" Ice	7.4500	3.7900	0.16
						2" Ice	8.6800	4.9000	0.29
(2) RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	1.9701	1.5865	0.07
						1/2" Ice	2.1466	1.7488	0.09
						1" Ice	2.3306	1.9185	0.12
						2" Ice	2.7207	2.2800	0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	1.5000 0.00 0.00	0.0000	166.0000	No Ice	1.9701	1.5865	0.07
						1/2" Ice	2.1466	1.7488	0.09
						1" Ice	2.3306	1.9185	0.12
						2" Ice	2.7207	2.2800	0.17
(2) KRY 112 489/2	A	From Leg	1.5000 0.00	0.0000	166.0000	No Ice	0.5592	0.3651	0.02
						1/2" Ice	0.6579	0.4484	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				Ice	0.7640	0.5420	0.03
							1" Ice	0.9984	0.7524	0.05
							2" Ice			
KRY 112 489/2	B	From Leg	1.5000		0.0000	166.0000	No Ice	0.5592	0.3651	0.02
			0.00				1/2"	0.6579	0.4484	0.02
			0.00				Ice	0.7640	0.5420	0.03
							1" Ice	0.9984	0.7524	0.05
							2" Ice			
KRY 112 144/1	B	From Leg	1.5000		0.0000	166.0000	No Ice	0.3500	0.1750	0.01
			0.00				1/2"	0.4259	0.2343	0.01
			0.00				Ice	0.5093	0.3009	0.02
							1" Ice	0.6981	0.4565	0.03
							2" Ice			
(2) KRY 112 144/1	C	From Leg	1.5000		0.0000	166.0000	No Ice	0.3500	0.1750	0.01
			0.00				1/2"	0.4259	0.2343	0.01
			0.00				Ice	0.5093	0.3009	0.02
							1" Ice	0.6981	0.4565	0.03
							2" Ice			
T-Arm Mount [TA 702-3]	C	None			0.0000	166.0000	No Ice	4.7500	4.7500	0.34
							1/2"	5.8200	5.8200	0.43
							Ice	6.9800	6.9800	0.55
							1" Ice	9.7200	9.7200	0.87
							2" Ice			
10' horizontal x 2" Pipe Mount	A	From Leg	1.5000		0.0000	166.0000	No Ice	1.9000	0.0100	0.03
			0.00				1/2"	2.9200	0.0400	0.04
			0.00				Ice	3.9700	0.0900	0.06
							1" Ice	5.6500	0.2100	0.13
							2" Ice			
10' horizontal x 2" Pipe Mount	B	From Leg	1.5000		0.0000	166.0000	No Ice	1.9000	0.0100	0.03
			0.00				1/2"	2.9200	0.0400	0.04
			0.00				Ice	3.9700	0.0900	0.06
							1" Ice	5.6500	0.2100	0.13
							2" Ice			
10' horizontal x 2" Pipe Mount	C	From Leg	1.5000		0.0000	166.0000	No Ice	1.9000	0.0100	0.03
			0.00				1/2"	2.9200	0.0400	0.04
			0.00				Ice	3.9700	0.0900	0.06
							1" Ice	5.6500	0.2100	0.13
							2" Ice			
***										
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000		0.0000	157.0000	No Ice	4.0900	2.8600	0.08
			0.00				1/2"	4.4800	3.2300	0.13
			0.00				Ice	4.8800	3.6100	0.19
							1" Ice	5.7100	4.4000	0.33
							2" Ice			
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000		0.0000	157.0000	No Ice	4.0900	2.8600	0.08
			0.00				1/2"	4.4800	3.2300	0.13
			0.00				Ice	4.8800	3.6100	0.19
							1" Ice	5.7100	4.4000	0.33
							2" Ice			
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000		0.0000	157.0000	No Ice	4.0900	2.8600	0.08
			0.00				1/2"	4.4800	3.2300	0.13
			0.00				Ice	4.8800	3.6100	0.19
							1" Ice	5.7100	4.4000	0.33
							2" Ice			
DT465B-2XR w/ Mount Pipe	A	From Leg	4.0000		0.0000	157.0000	No Ice	5.5000	4.3800	0.09
			0.00				1/2"	5.9700	4.8400	0.16
			0.00				Ice	6.4500	5.3000	0.25
							1" Ice	7.4400	6.2600	0.45
							2" Ice			
DT465B-2XR w/ Mount Pipe	B	From Leg	4.0000		0.0000	157.0000	No Ice	5.5000	4.3800	0.09
			0.00				1/2"	5.9700	4.8400	0.16
			0.00				Ice	6.4500	5.3000	0.25
							1" Ice	7.4400	6.2600	0.45
							2" Ice			
DT465B-2XR w/ Mount	C	From Leg	4.0000		0.0000	157.0000	No Ice	5.5000	4.3800	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice	5.9700 6.4500 7.4400	4.8400 5.3000 6.2600	0.16 0.25 0.45
(3) ACU-A20-N	A	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0667 0.1037 0.1481 0.2593	0.1167 0.1620 0.2148 0.3426	0.00 0.00 0.00 0.01
(3) ACU-A20-N	B	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0667 0.1037 0.1481 0.2593	0.1167 0.1620 0.2148 0.3426	0.00 0.00 0.00 0.01
(3) ACU-A20-N	C	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0667 0.1037 0.1481 0.2593	0.1167 0.1620 0.2148 0.3426	0.00 0.00 0.00 0.01
TD-RRH8X20-25	A	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
(2) TD-RRH8X20-25	C	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
(2) RRH2X50-800	B	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.7008 1.8640 2.0345 2.3979	1.2822 1.4275 1.5803 1.9081	0.05 0.07 0.09 0.14
RRH2X50-800	C	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.7008 1.8640 2.0345 2.3979	1.2822 1.4275 1.5803 1.9081	0.05 0.07 0.09 0.14
Platform Mount [LP 712-1]	C	None		0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	24.5600 27.9200 31.2700 37.9800	24.5600 27.9200 31.2700 37.9800	1.34 1.91 2.55 3.97
2.375" OD x 4' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
2.375" OD x 4' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
2.375" OD x 4' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.0000	157.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8657 1.1106 1.3648 1.9008	0.8657 1.1106 1.3648 1.9008	0.02 0.03 0.04 0.06
***									
800 EXTERNAL NOTCH FILTER	A	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.6601 0.7627 0.8727 1.1149	0.3211 0.3983 0.4830 0.6744	0.01 0.02 0.02 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800 EXTERNAL NOTCH FILTER	B	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.6601 0.7627 0.8727 1.1149	0.3211 0.3983 0.4830 0.6744	0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	C	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.6601 0.7627 0.8727 1.1149	0.3211 0.3983 0.4830 0.6744	0.01 0.02 0.02 0.04
1900MHz RRH (65MHz) w/ Mount Pipe	A	From Leg	2.0000 0.00 -1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7273 3.0489 3.3824 4.0848	3.2407 3.6916 4.1590 5.1440	0.07 0.11 0.15 0.24
1900MHz RRH (65MHz) w/ Mount Pipe	B	From Leg	2.0000 0.00 -1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7273 3.0489 3.3824 4.0848	3.2407 3.6916 4.1590 5.1440	0.07 0.11 0.15 0.24
1900MHz RRH (65MHz) w/ Mount Pipe	C	From Leg	2.0000 0.00 -1.00	0.0000	155.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7273 3.0489 3.3824 4.0848	3.2407 3.6916 4.1590 5.1440	0.07 0.11 0.15 0.24
800MHZ RRH	A	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.1342 2.3195 2.5123 2.9201	1.7730 1.9461 2.1267 2.5100	0.05 0.07 0.10 0.16
800MHZ RRH	B	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.1342 2.3195 2.5123 2.9201	1.7730 1.9461 2.1267 2.5100	0.05 0.07 0.10 0.16
800MHZ RRH	C	From Leg	2.0000 0.00 1.00	0.0000	155.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.1342 2.3195 2.5123 2.9201	1.7730 1.9461 2.1267 2.5100	0.05 0.07 0.10 0.16
Side Arm Mount [SO 102-3]	C	None		0.0000	155.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	3.6000 4.1800 4.7500 5.9000	3.6000 4.1800 4.7500 5.9000	0.07 0.11 0.14 0.20
***									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	145.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	4.5639 5.1051 5.6116 6.6508	10.2588 11.4274 12.3118 14.1293	0.05 0.11 0.19 0.36
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.0000	145.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	4.5639 5.1051 5.6116 6.6508	10.2588 11.4274 12.3118 14.1293	0.05 0.11 0.19 0.36
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	145.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	4.5639 5.1051 5.6116 6.6508	10.2588 11.4274 12.3118 14.1293	0.05 0.11 0.19 0.36
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	145.0000	No Ice 1/2" Ice Ice 1" Ice	7.8065 8.3569 8.8720 9.9271	5.8008 6.9529 7.8191 9.6015	0.04 0.10 0.17 0.34

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	7.8065 8.3569 8.8720 9.9271	5.8008 6.9529 7.8191 9.6015	0.04 0.10 0.17 0.34
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	7.8065 8.3569 8.8720 9.9271	5.8008 6.9529 7.8191 9.6015	0.04 0.10 0.17 0.34
BXA-171085-12BF-2 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	4.9710 5.5211 6.0361 7.0911	5.2283 6.3892 7.2610 9.0462	0.04 0.09 0.14 0.27
BXA-171085-12BF-2 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	4.9710 5.5211 6.0361 7.0911	5.2283 6.3892 7.2610 9.0462	0.04 0.09 0.14 0.27
BXA-171085-12BF-2 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	4.9710 5.5211 6.0361 7.0911	5.2283 6.3892 7.2610 9.0462	0.04 0.09 0.14 0.27
(2) FD9R6004/2C-3L	A	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	B	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
(2) FD9R6004/2C-3L	C	From Leg	4.0000 0.00 2.00	0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
Platform Mount [LP 403-1]	C	None		0.0000	145.0000	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	18.9400 23.3100 27.7400 36.7700	18.9400 23.3100 27.7400 36.7700	1.50 1.90 2.37 3.53
***									
RRUS 11	A	From Leg	2.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.09 0.15
RRUS 11	B	From Leg	2.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.09 0.15
RRUS 11	C	From Leg	2.0000 0.00 0.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.09 0.15
Side Arm Mount [SO 102-3]	C	None		0.0000	120.0000	No Ice 1/2" Ice Ice	3.6000 4.1800 4.7500	3.6000 4.1800 4.7500	0.07 0.11 0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice 2" Ice	5.9000	5.9000	0.20
***									
7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.7460 6.1791 6.6067 7.4880	4.2543 5.0137 5.7109 7.1553	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.7460 6.1791 6.6067 7.4880	4.2543 5.0137 5.7109 7.1553	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	5.7460 6.1791 6.6067 7.4880	4.2543 5.0137 5.7109 7.1553	0.06 0.10 0.16 0.29
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.6300 5.0600 5.5100 6.4300	3.2700 3.6900 4.1200 5.0000	0.07 0.13 0.20 0.38
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.9900 3.3000 3.6200 4.2800	2.1400 2.4300 2.7300 3.3600	0.05 0.10 0.14 0.27
800 10764 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.3300 4.7700 5.2200 6.1500	3.1200 3.5300 3.9600 4.8500	0.07 0.11 0.17 0.31
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 9.9800 10.7600 12.3600	6.2500 6.9600 7.7000 9.2200	0.07 0.14 0.22 0.42
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.0400 3.3400 3.6500 4.3100	2.4500 2.7500 3.0500 3.6800	0.05 0.10 0.16 0.31
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.0400 3.3400 3.6500 4.3100	2.4500 2.7500 3.0500 3.6800	0.05 0.10 0.16 0.31
(4) LGP2140X	A	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.0800 1.2137 1.3548 1.6593	0.3580 0.4536 0.5563 0.7825	0.02 0.03 0.04 0.06
(4) LGP2140X	B	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.0800 1.2137 1.3548 1.6593	0.3580 0.4536 0.5563 0.7825	0.02 0.03 0.04 0.06
(4) LGP2140X	C	From Leg	4.0000 0.00 1.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.0800 1.2137 1.3548 1.6593	0.3580 0.4536 0.5563 0.7825	0.02 0.03 0.04 0.06
DC6-48-60-18-8F	B	From Leg	4.0000 0.00	0.0000	118.0000	No Ice 1/2"	1.2117 1.8924	1.2117 1.8924	0.02 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice	2.1051	2.1051	0.07
						1" Ice	2.5703	2.5703	0.13
						2" Ice			
(2) 7020.00	A	From Leg	4.0000	0.0000	118.0000	No Ice	0.1021	0.1750	0.00
			0.00			1/2"	0.1469	0.2393	0.01
			1.00			Ice	0.1991	0.3109	0.01
						1" Ice	0.3258	0.4765	0.02
						2" Ice			
(2) 7020.00	B	From Leg	4.0000	0.0000	118.0000	No Ice	0.1021	0.1750	0.00
			0.00			1/2"	0.1469	0.2393	0.01
			1.00			Ice	0.1991	0.3109	0.01
						1" Ice	0.3258	0.4765	0.02
						2" Ice			
(2) 7020.00	C	From Leg	4.0000	0.0000	118.0000	No Ice	0.1021	0.1750	0.00
			0.00			1/2"	0.1469	0.2393	0.01
			1.00			Ice	0.1991	0.3109	0.01
						1" Ice	0.3258	0.4765	0.02
						2" Ice			
RRUS 4415 B25	A	From Leg	4.0000	0.0000	118.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2"	1.8044	0.7911	0.06
			1.00			Ice	1.9719	0.9129	0.07
						1" Ice	2.3292	1.1834	0.11
						2" Ice			
RRUS 4415 B25	B	From Leg	4.0000	0.0000	118.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2"	1.8044	0.7911	0.06
			1.00			Ice	1.9719	0.9129	0.07
						1" Ice	2.3292	1.1834	0.11
						2" Ice			
RRUS 4415 B25	C	From Leg	4.0000	0.0000	118.0000	No Ice	1.6444	0.6788	0.04
			0.00			1/2"	1.8044	0.7911	0.06
			1.00			Ice	1.9719	0.9129	0.07
						1" Ice	2.3292	1.1834	0.11
						2" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	118.0000	No Ice	14.6900	14.6900	1.25
						1/2"	18.0100	18.0100	1.57
						Ice	21.3400	21.3400	1.94
						1" Ice	28.0800	28.0800	2.85
						2" Ice			
**********									
**********									
KS24019-L112A	C	From Leg	3.0000	0.0000	74.0000	No Ice	0.1000	0.1000	0.01
			0.00			1/2"	0.1800	0.1800	0.01
			1.00			Ice	0.2600	0.2600	0.01
						1" Ice	0.4200	0.4200	0.01
						2" Ice			
Side Arm Mount [SO 702-1]	C	None		0.0000	74.0000	No Ice	0.6200	1.4900	0.03
						1/2"	0.7400	2.0700	0.04
						Ice	0.8900	2.5400	0.06
						1" Ice	1.2500	3.5500	0.12
						2" Ice			
***									
**									

Tower Pressures - No Ice

G_H = 1.100

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
L1 168.0000-158.0000	163.0000	1.403	45.72	11.667	A	0.000	11.667	11.667	100.00	0.000	0.000
					B	0.000	11.667		100.00	7.800	0.000
					C	0.000	11.667		100.00	0.000	0.000
L2 158.0000-116.5000	136.4479	1.351	44.01	89.692	A	0.000	89.692	89.692	100.00	0.000	0.000
					B	0.000	89.692		100.00	40.462	0.000
					C	0.000	89.692		100.00	0.000	0.000
L3 116.5000-80.2500	97.9594	1.26	41.03	97.680	A	0.000	97.680	97.680	100.00	7.500	0.000
					B	0.000	97.680		100.00	42.844	0.000
					C	0.000	97.680		100.00	7.500	0.000
L4 80.2500-39.7500	59.7435	1.136	36.88	130.009	A	0.000	130.009	130.009	100.00	36.000	0.000
					B	0.000	130.009		100.00	75.487	0.000
					C	0.000	130.009		100.00	36.000	0.000
L5 39.7500-0.0000	20.0692	0.903	29.74	148.685	A	0.000	148.685	148.685	100.00	47.042	0.000
					B	0.000	148.685		100.00	85.798	0.000
					C	0.000	148.685		100.00	41.083	0.000

Tower Pressure - With Ice

G_H = 1.100

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
L1 168.0000-158.0000	163.0000	1.403	7.94	1.9944	14.991	A	0.000	14.991	14.991	100.00	0.000	0.000
						B	0.000	14.991		100.00	13.739	0.000
						C	0.000	14.991		100.00	0.000	0.000
L2 158.0000-116.5000	136.4479	1.351	7.64	1.9593	103.244	A	0.000	103.244	103.244	100.00	0.000	0.000
						B	0.000	103.244		100.00	70.906	0.000
						C	0.000	103.244		100.00	0.000	0.000
L3 116.5000-80.2500	97.9594	1.26	7.12	1.8954	109.517	A	0.000	109.517	109.517	100.00	9.695	0.000
						B	0.000	109.517		100.00	71.630	0.000
						C	0.000	109.517		100.00	9.695	0.000
L4 80.2500-39.7500	59.7435	1.136	6.40	1.8040	142.803	A	0.000	142.803	142.803	100.00	49.647	0.000
						B	0.000	142.803		100.00	118.197	0.000
						C	0.000	142.803		100.00	49.647	0.000
L5 39.7500-0.0000	20.0692	0.903	5.16	1.6175	160.636	A	0.000	160.636	160.636	100.00	63.097	0.000
						B	0.000	160.636		100.00	129.469	0.000
						C	0.000	160.636		100.00	55.154	0.000

Tower Pressure - Service

G_H = 1.100

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
L1 168.0000-158.0000	163.0000	1.403	10.77	11.667	A	0.000	11.667	11.667	100.00	0.000	0.000
					B	0.000	11.667		100.00	7.800	0.000
					C	0.000	11.667		100.00	0.000	0.000
L2 158.0000-116.5000	136.4479	1.351	10.36	89.692	A	0.000	89.692	89.692	100.00	0.000	0.000
					B	0.000	89.692		100.00	40.462	0.000
					C	0.000	89.692		100.00	0.000	0.000
L3 116.5000-80.2500	97.9594	1.26	9.66	97.680	A	0.000	97.680	97.680	100.00	7.500	0.000
					B	0.000	97.680		100.00	42.844	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
L4 80.2500-39.7500	59.7435	1.136	8.68	130.009	C	0.000	97.680		100.00	7.500	0.000
					A	0.000	130.009	130.009	100.00	36.000	0.000
					B	0.000	130.009		100.00	75.487	0.000
					C	0.000	130.009		100.00	36.000	0.000
L5 39.7500-0.0000	20.0692	0.903	7.00	148.685	A	0.000	148.685	148.685	100.00	47.042	0.000
					B	0.000	148.685		100.00	85.798	0.000
					C	0.000	148.685		100.00	41.083	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	168 - 158	Pole	Max Tension	20	0.00	-0.00	-0.00
			Max. Compression	26	-6.78	-0.67	0.81
			Max. Mx	8	-1.70	-28.91	0.26
			Max. My	2	-1.82	-0.22	26.44
			Max. Vy	8	3.93	-28.91	0.26
			Max. Vx	24	-3.47	14.21	25.48
			Max. Torque	10			0.51
L2	158 - 116.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.57	-2.17	1.35
			Max. Mx	8	-9.40	-515.23	3.37
			Max. My	2	-9.64	-3.65	484.76
			Max. Vy	8	16.18	-515.23	3.37
			Max. Vx	2	-15.27	-3.65	484.76
			Max. Torque	8			0.60
L3	116.5 - 80.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.94	-5.65	3.96
			Max. Mx	8	-18.43	-1266.59	7.16
			Max. My	2	-18.63	-7.85	1202.74
			Max. Vy	8	22.89	-1266.59	7.16
			Max. Vx	2	-21.87	-7.85	1202.74
			Max. Torque	8			0.79
L4	80.25 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.36	-9.20	6.07
			Max. Mx	8	-30.23	-2251.90	11.38
			Max. My	2	-30.35	-12.63	2143.81
			Max. Vy	8	26.44	-2251.90	11.38
			Max. Vx	2	-25.27	-12.63	2143.81
			Max. Torque	8			0.79
L5	39.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.19	-13.14	8.92
			Max. Mx	8	-48.36	-3511.21	16.43
			Max. My	2	-48.37	-18.03	3348.66
			Max. Vy	8	29.11	-3511.21	16.43
			Max. Vx	2	-27.90	-18.03	3348.66
			Max. Torque	8			0.77

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	92.19	0.00	-0.00
	Max. H_x	21	36.30	29.05	-0.08
	Max. H_z	3	36.30	-0.08	27.85
	Max. M_x	2	3348.66	-0.08	27.85
	Max. M_z	8	3511.21	-29.05	0.08
	Max. Torsion	8	0.77	-29.05	0.08
	Min. Vert	9	36.30	-29.05	0.08
	Min. H_x	8	48.40	-29.05	0.08
	Min. H_z	15	36.30	0.08	-27.85
	Min. M_x	14	-3341.88	0.08	-27.85
	Min. M_z	20	-3500.87	29.05	-0.08
	Min. Torsion	20	-0.76	29.05	-0.08

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	40.33	-0.00	0.00	-2.72	-3.96	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	48.40	0.08	-27.85	-3348.66	-18.03	-0.08
0.9 Dead+1.0 Wind 0 deg - No Ice	36.30	0.08	-27.85	-3283.15	-16.42	-0.09
1.2 Dead+1.0 Wind 30 deg - No Ice	48.40	13.95	-24.16	-2907.91	-1682.89	-0.39
0.9 Dead+1.0 Wind 30 deg - No Ice	36.30	13.95	-24.16	-2850.53	-1648.91	-0.40
1.2 Dead+1.0 Wind 60 deg - No Ice	48.40	24.08	-14.00	-1687.88	-2898.18	-0.60
0.9 Dead+1.0 Wind 60 deg - No Ice	36.30	24.08	-14.00	-1654.20	-2840.58	-0.60
1.2 Dead+1.0 Wind 90 deg - No Ice	48.40	29.05	-0.08	-16.43	-3511.21	-0.77
0.9 Dead+1.0 Wind 90 deg - No Ice	36.30	29.05	-0.08	-15.25	-3441.64	-0.75
1.2 Dead+1.0 Wind 120 deg - No Ice	48.40	26.01	15.02	1807.38	-3143.02	-0.72
0.9 Dead+1.0 Wind 120 deg - No Ice	36.30	26.01	15.02	1773.18	-3080.83	-0.69
1.2 Dead+1.0 Wind 150 deg - No Ice	48.40	14.85	25.89	3097.96	-1781.49	-0.40
0.9 Dead+1.0 Wind 150 deg - No Ice	36.30	14.85	25.89	3038.74	-1745.74	-0.37
1.2 Dead+1.0 Wind 180 deg - No Ice	48.40	-0.08	27.85	3341.88	8.05	0.08
0.9 Dead+1.0 Wind 180 deg - No Ice	36.30	-0.08	27.85	3278.15	9.08	0.10
1.2 Dead+1.0 Wind 210 deg - No Ice	48.40	-13.95	24.16	2901.16	1672.94	0.40
0.9 Dead+1.0 Wind 210 deg - No Ice	36.30	-13.95	24.16	2845.56	1641.59	0.40
1.2 Dead+1.0 Wind 240 deg - No Ice	48.40	-24.08	14.00	1681.11	2888.28	0.60
0.9 Dead+1.0 Wind 240 deg - No Ice	36.30	-24.08	14.00	1649.22	2833.30	0.60
1.2 Dead+1.0 Wind 270 deg - No Ice	48.40	-29.05	0.08	9.63	3500.87	0.76
0.9 Dead+1.0 Wind 270 deg - No Ice	36.30	-29.05	0.08	10.24	3434.38	0.74
1.2 Dead+1.0 Wind 300 deg - No Ice	48.40	-26.01	-15.02	-1814.21	3133.12	0.71
0.9 Dead+1.0 Wind 300 deg - No Ice	36.30	-26.01	-15.02	-1778.21	3073.55	0.68
1.2 Dead+1.0 Wind 330 deg - No Ice	48.40	-14.85	-25.89	-3104.79	1771.53	0.40
0.9 Dead+1.0 Wind 330 deg - No Ice	36.30	-14.85	-25.89	-3043.76	1738.42	0.37
1.2 Dead+1.0 Ice+1.0 Temp	92.19	-0.00	0.00	-8.92	-13.14	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	92.19	0.02	-8.20	-1114.08	-16.18	0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	92.19	4.10	-7.11	-967.49	-567.02	-0.07
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	92.19	7.09	-4.11	-564.07	-969.47	-0.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	92.19	8.23	-0.02	-11.92	-1125.57	-0.20
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	92.19	7.13	4.12	547.28	-977.39	-0.20
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	92.19	4.10	7.14	956.13	-567.46	-0.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	92.19	-0.02	8.20	1096.11	-10.32	-0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	92.19	-4.10	7.11	949.53	540.53	0.07

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	92.19	-7.09	4.11	546.11	942.99	0.14
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	92.19	-8.23	0.02	-6.06	1099.10	0.20
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	92.19	-7.13	-4.12	-565.27	950.90	0.20
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	92.19	-4.10	-7.14	-974.12	540.96	0.14
Dead+Wind 0 deg - Service	40.33	0.02	-6.56	-783.46	-7.15	-0.02
Dead+Wind 30 deg - Service	40.33	3.28	-5.69	-680.39	-395.54	-0.10
Dead+Wind 60 deg - Service	40.33	5.67	-3.29	-395.77	-679.04	-0.14
Dead+Wind 90 deg - Service	40.33	6.84	-0.02	-5.86	-822.58	-0.18
Dead+Wind 120 deg - Service	40.33	6.12	3.54	419.91	-736.69	-0.17
Dead+Wind 150 deg - Service	40.33	3.50	6.09	721.09	-418.78	-0.09
Dead+Wind 180 deg - Service	40.33	-0.02	6.56	777.82	-1.07	0.02
Dead+Wind 210 deg - Service	40.33	-3.28	5.69	674.75	387.31	0.10
Dead+Wind 240 deg - Service	40.33	-5.67	3.29	390.13	670.81	0.14
Dead+Wind 270 deg - Service	40.33	-6.84	0.02	0.22	814.36	0.18
Dead+Wind 300 deg - Service	40.33	-6.12	-3.54	-425.55	728.47	0.17
Dead+Wind 330 deg - Service	40.33	-3.50	-6.09	-726.74	410.55	0.09

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-40.33	0.00	0.00	40.33	-0.00	0.002%
2	0.08	-48.40	-27.86	-0.08	48.40	27.85	0.014%
3	0.08	-36.30	-27.86	-0.08	36.30	27.85	0.011%
4	13.95	-48.40	-24.16	-13.95	48.40	24.16	0.000%
5	13.95	-36.30	-24.16	-13.95	36.30	24.16	0.000%
6	24.08	-48.40	-14.00	-24.08	48.40	14.00	0.000%
7	24.08	-36.30	-14.00	-24.08	36.30	14.00	0.000%
8	29.06	-48.40	-0.08	-29.05	48.40	0.08	0.009%
9	29.06	-36.30	-0.08	-29.05	36.30	0.08	0.011%
10	26.01	-48.40	15.02	-26.01	48.40	-15.02	0.000%
11	26.01	-36.30	15.02	-26.01	36.30	-15.02	0.000%
12	14.85	-48.40	25.89	-14.85	48.40	-25.89	0.000%
13	14.85	-36.30	25.89	-14.85	36.30	-25.89	0.000%
14	-0.08	-48.40	27.86	0.08	48.40	-27.85	0.014%
15	-0.08	-36.30	27.86	0.08	36.30	-27.85	0.011%
16	-13.95	-48.40	24.16	13.95	48.40	-24.16	0.000%
17	-13.95	-36.30	24.16	13.95	36.30	-24.16	0.000%
18	-24.08	-48.40	14.00	24.08	48.40	-14.00	0.000%
19	-24.08	-36.30	14.00	24.08	36.30	-14.00	0.000%
20	-29.06	-48.40	0.08	29.05	48.40	-0.08	0.015%
21	-29.06	-36.30	0.08	29.05	36.30	-0.08	0.011%
22	-26.01	-48.40	-15.02	26.01	48.40	15.02	0.000%
23	-26.01	-36.30	-15.02	26.01	36.30	15.02	0.000%
24	-14.85	-48.40	-25.89	14.85	48.40	25.89	0.000%
25	-14.85	-36.30	-25.89	14.85	36.30	25.89	0.000%
26	0.00	-92.19	0.00	0.00	92.19	-0.00	0.000%
27	0.02	-92.19	-8.20	-0.02	92.19	8.20	0.002%
28	4.11	-92.19	-7.11	-4.10	92.19	7.11	0.002%
29	7.10	-92.19	-4.11	-7.09	92.19	4.11	0.002%
30	8.23	-92.19	-0.02	-8.23	92.19	0.02	0.002%
31	7.13	-92.19	4.12	-7.13	92.19	-4.12	0.002%
32	4.11	-92.19	7.14	-4.10	92.19	-7.14	0.002%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	-0.02	-92.19	8.20	0.02	92.19	-8.20	0.002%
34	-4.11	-92.19	7.11	4.10	92.19	-7.11	0.002%
35	-7.10	-92.19	4.11	7.09	92.19	-4.11	0.002%
36	-8.23	-92.19	0.02	8.23	92.19	-0.02	0.002%
37	-7.13	-92.19	-4.12	7.13	92.19	4.12	0.002%
38	-4.11	-92.19	-7.14	4.10	92.19	7.14	0.002%
39	0.02	-40.33	-6.56	-0.02	40.33	6.56	0.004%
40	3.28	-40.33	-5.69	-3.28	40.33	5.69	0.004%
41	5.67	-40.33	-3.30	-5.67	40.33	3.29	0.004%
42	6.84	-40.33	-0.02	-6.84	40.33	0.02	0.004%
43	6.12	-40.33	3.54	-6.12	40.33	-3.54	0.004%
44	3.50	-40.33	6.10	-3.50	40.33	-6.09	0.004%
45	-0.02	-40.33	6.56	0.02	40.33	-6.56	0.004%
46	-3.28	-40.33	5.69	3.28	40.33	-5.69	0.004%
47	-5.67	-40.33	3.30	5.67	40.33	-3.29	0.004%
48	-6.84	-40.33	0.02	6.84	40.33	-0.02	0.004%
49	-6.12	-40.33	-3.54	6.12	40.33	3.54	0.004%
50	-3.50	-40.33	-6.10	3.50	40.33	6.09	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00001058
2	Yes	20	0.00014403	0.00013563
3	Yes	20	0.00009233	0.00010277
4	Yes	28	0.00000001	0.00010811
5	Yes	27	0.00000001	0.00011532
6	Yes	28	0.00000001	0.00010891
7	Yes	27	0.00000001	0.00011627
8	Yes	21	0.00008827	0.00011085
9	Yes	20	0.00009087	0.00013118
10	Yes	28	0.00000001	0.00012560
11	Yes	27	0.00000001	0.00013279
12	Yes	28	0.00000001	0.00012273
13	Yes	27	0.00000001	0.00012994
14	Yes	20	0.00014408	0.00012635
15	Yes	20	0.00009235	0.00009992
16	Yes	28	0.00000001	0.00010769
17	Yes	27	0.00000001	0.00011523
18	Yes	28	0.00000001	0.00010681
19	Yes	27	0.00000001	0.00011426
20	Yes	20	0.00014197	0.00012366
21	Yes	20	0.00009091	0.00009587
22	Yes	28	0.00000001	0.00012693
23	Yes	27	0.00000001	0.00013422
24	Yes	28	0.00000001	0.00012159
25	Yes	27	0.00000001	0.00012885
26	Yes	19	0.00000001	0.00000353
27	Yes	26	0.00010589	0.00002011
28	Yes	26	0.00010528	0.00008495
29	Yes	26	0.00010526	0.00006539
30	Yes	26	0.00010586	0.00002046
31	Yes	26	0.00010531	0.00008249
32	Yes	26	0.00010530	0.00008441
33	Yes	26	0.00010592	0.00001962
34	Yes	26	0.00010539	0.00007830
35	Yes	26	0.00010539	0.00007778
36	Yes	26	0.00010593	0.00001979
37	Yes	26	0.00010533	0.00008365
38	Yes	26	0.00010534	0.00008112
39	Yes	20	0.00012314	0.00003566
40	Yes	20	0.00012277	0.00006808
41	Yes	20	0.00012278	0.00007090
42	Yes	20	0.00012307	0.00003791
43	Yes	20	0.00012256	0.00008421

44	Yes	20	0.00012260	0.00008389
45	Yes	20	0.00012315	0.00003540
46	Yes	20	0.00012280	0.00006761
47	Yes	20	0.00012280	0.00006451
48	Yes	20	0.00012309	0.00003730
49	Yes	20	0.00012256	0.00008844
50	Yes	20	0.00012261	0.00008047

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168 - 158	49.056	43	2.5562	0.0026
L2	158 - 116.5	43.722	43	2.5263	0.0016
L3	120.25 - 80.25	25.112	43	2.0629	0.0014
L4	84.75 - 39.75	12.059	43	1.3902	0.0006
L5	45 - 0	3.306	43	0.6764	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.0000	Lightning Rod 5/8x4'	43	49.056	2.5562	0.0026	24473
166.0000	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	43	47.986	2.5519	0.0024	24473
157.0000	APXVTM14-C-120 w/ Mount Pipe	43	43.193	2.5213	0.0015	11444
155.0000	800 EXTERNAL NOTCH FILTER	43	42.137	2.5097	0.0014	9914
145.0000	(2) LPA-80080/6CF w/ Mount Pipe	43	36.942	2.4241	0.0012	6011
120.0000	RRUS 11	43	25.003	2.0586	0.0014	3086
118.0000	7770.00 w/ Mount Pipe	43	24.139	2.0233	0.0014	3055
74.0000	KS24019-L112A	43	9.066	1.1865	0.0004	3045

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168 - 158	208.608	10	10.9293	0.0119
L2	158 - 116.5	186.025	10	10.8026	0.0076
L3	120.25 - 80.25	107.110	10	8.8252	0.0061
L4	84.75 - 39.75	51.530	10	5.9499	0.0028
L5	45 - 0	14.141	10	2.8947	0.0010

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.0000	Lightning Rod 5/8x4'	10	208.608	10.9293	0.0119	6215
166.0000	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	10	204.078	10.9111	0.0109	6215
157.0000	APXVTM14-C-120 w/ Mount Pipe	10	183.782	10.7814	0.0072	2895
155.0000	800 EXTERNAL NOTCH FILTER	10	179.309	10.7323	0.0067	2501
145.0000	(2) LPA-80080/6CF w/ Mount	10	157.300	10.3671	0.0056	1511

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
	Pipe					
120.0000	RRUS 11	10	106.646	8.8066	0.0061	763
118.0000	7770.00 w/ Mount Pipe	10	102.974	8.6558	0.0061	754
74.0000	KS24019-L112A	10	38.753	5.0784	0.0019	725

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	168 - 167	TP14x14x0.25	10.0000	0.0000	0.0	10.7992	-0.19	340.18	0.001
	167 - 166					10.7992	-0.12	340.18	0.000
	166 - 165					10.7992	-1.37	340.18	0.004
	165 - 164					10.7992	-1.42	340.18	0.004
	164 - 163					10.7992	-1.46	340.18	0.004
	163 - 162					10.7992	-1.50	340.18	0.004
	162 - 161					10.7992	-1.55	340.18	0.005
	161 - 160					10.7992	-1.59	340.18	0.005
	160 - 159					10.7992	-1.63	340.18	0.005
	159 - 158					10.7992	-1.66	340.18	0.005
L2	158 - 156.013	TP29.139x22x0.1875	41.5000	0.0000	0.0	13.1846	-3.95	771.30	0.005
	156.013 - 154.026					13.3880	-4.49	783.20	0.006
	154.026 - 152.039					13.5914	-4.64	795.10	0.006
	152.039 - 150.053					13.7948	-4.79	807.00	0.006
	150.053 - 148.066					13.9982	-4.94	818.89	0.006
	148.066 - 146.079					14.2016	-5.09	830.79	0.006
	146.079 - 144.092					14.4050	-6.93	842.69	0.008
	144.092 - 142.105					14.6084	-7.10	854.59	0.008
	142.105 - 140.118					14.8118	-7.27	866.49	0.008
	140.118 - 138.132					15.0152	-7.45	878.39	0.008
	138.132 - 136.145					15.2186	-7.64	890.29	0.009
	136.145 - 134.158					15.4220	-7.82	902.19	0.009
	134.158 - 132.171					15.6254	-8.02	914.09	0.009
	132.171 - 130.184					15.8288	-8.21	925.99	0.009
	130.184 - 128.197					16.0322	-8.41	937.89	0.009
	128.197 - 126.211					16.2356	-8.62	949.78	0.009
	126.211 -					16.439	-8.83	961.68	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	124.224					0			
	124.224 - 122.237					16.6424	-9.04	973.58	0.009
	122.237 - 120.25					16.8459	-9.26	985.48	0.009
	120.25 - 116.5					17.2298	-6.19	1007.94	0.006
L3	120.25 - 116.5	TP35x28.119x0.25	40.0000	0.0000	0.0	22.6259	-6.19	1323.62	0.005
	116.5 - 114.736					22.8667	-12.68	1337.70	0.009
	114.736 - 112.972					23.1075	-12.98	1351.79	0.010
	112.972 - 111.208					23.3483	-13.29	1365.87	0.010
	111.208 - 109.444					23.5890	-13.60	1379.96	0.010
	109.444 - 107.681					23.8298	-13.91	1394.04	0.010
	107.681 - 105.917					24.0706	-14.22	1408.13	0.010
	105.917 - 104.153					24.3114	-14.54	1422.21	0.010
	104.153 - 102.389					24.5521	-14.87	1436.30	0.010
	102.389 - 100.625					24.7929	-15.19	1450.38	0.010
	100.625 - 98.8611					25.0337	-15.52	1464.47	0.011
	98.8611 - 97.0972					25.2744	-15.86	1478.56	0.011
	97.0972 - 95.3333					25.5152	-16.19	1492.64	0.011
	95.3333 - 93.5694					25.7560	-16.53	1506.73	0.011
	93.5694 - 91.8056					25.9968	-16.87	1520.81	0.011
	91.8056 - 90.0417					26.2375	-17.22	1534.90	0.011
	90.0417 - 88.2778					26.4783	-17.57	1548.98	0.011
	88.2778 - 86.5139					26.7191	-17.92	1563.07	0.011
	86.5139 - 84.75					26.9599	-18.28	1577.15	0.012
	84.75 - 80.25					27.5741	-8.91	1613.09	0.006
L4	84.75 - 80.25	TP41.467x33.726x0.3125	45.0000	0.0000	0.0	33.9098	-10.80	1983.72	0.005
	80.25 - 78.2917					34.2440	-20.26	2003.27	0.010
	78.2917 - 76.3333					34.5781	-20.81	2022.82	0.010
	76.3333 - 74.375					34.9122	-21.36	2042.37	0.010
	74.375 - 72.4167					35.2464	-21.95	2061.91	0.011
	72.4167 - 70.4583					35.5805	-22.51	2081.46	0.011
	70.4583 - 68.5					35.9147	-23.07	2101.01	0.011
	68.5 - 66.5417					36.2488	-23.64	2120.56	0.011
	66.5417 - 64.5833					36.5829	-24.22	2140.10	0.011
	64.5833 - 62.625					36.9171	-24.79	2159.65	0.011
	62.625 - 60.6667					37.2512	-25.37	2179.20	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	60.6667 - 58.7083					37.585 4	-25.95	2198.74	0.012
	58.7083 - 56.75					37.919 5	-26.54	2218.29	0.012
	56.75 - 54.7917					38.253 6	-27.13	2237.84	0.012
	54.7917 - 52.8333					38.587 8	-27.73	2257.39	0.012
	52.8333 - 50.875					38.921 9	-28.33	2276.93	0.012
	50.875 - 48.9167					39.256 1	-28.93	2296.48	0.013
	48.9167 - 46.9583					39.590 2	-29.53	2316.03	0.013
	46.9583 - 45					39.924 3	-30.14	2335.57	0.013
	45 - 39.75					40.820 1	-15.16	2387.98	0.006
L5	45 - 39.75	TP47.68x39.939x0.375	45.000 0	0.0000	0.0	48.166 0	-17.54	2817.71	0.006
	39.75 - 37.6579					48.594 3	-33.49	2842.77	0.012
	37.6579 - 35.5658					49.022 7	-34.28	2867.83	0.012
	35.5658 - 33.4737					49.451 1	-35.08	2892.89	0.012
	33.4737 - 31.3816					49.879 4	-35.88	2917.95	0.012
	31.3816 - 29.2895					50.307 8	-36.68	2943.00	0.012
	29.2895 - 27.1974					50.736 1	-37.49	2968.06	0.013
	27.1974 - 25.1053					51.164 5	-38.30	2993.12	0.013
	25.1053 - 23.0132					51.592 8	-39.11	3018.18	0.013
	23.0132 - 20.9211					52.021 2	-39.94	3043.24	0.013
	20.9211 - 18.8289					52.449 6	-40.76	3068.30	0.013
	18.8289 - 16.7368					52.877 9	-41.59	3093.36	0.013
	16.7368 - 14.6447					53.306 3	-42.42	3118.42	0.014
	14.6447 - 12.5526					53.734 6	-43.26	3143.48	0.014
	12.5526 - 10.4605					54.163 0	-44.10	3168.53	0.014
	10.4605 - 8.36842					54.591 3	-44.94	3193.59	0.014
	8.36842 - 6.27632					55.019 7	-45.79	3218.65	0.014
	6.27632 - 4.18421					55.448 1	-46.65	3243.71	0.014
	4.18421 - 2.09211					55.876 4	-47.50	3268.77	0.015
	2.09211 - 0					56.304 8	-48.36	3293.83	0.015

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	168 - 167	TP14x14x0.25	0.09	124.09	0.001	0.00	124.09	0.000
	167 - 166		0.29	124.09	0.002	0.00	124.09	0.000
	166 - 165		3.69	124.09	0.030	0.00	124.09	0.000
	165 - 164		7.03	124.09	0.057	0.00	124.09	0.000
	164 - 163		10.47	124.09	0.084	0.00	124.09	0.000
	163 - 162		14.01	124.09	0.113	0.00	124.09	0.000
	162 - 161		17.65	124.09	0.142	0.00	124.09	0.000
	161 - 160		21.39	124.09	0.172	0.00	124.09	0.000
	160 - 159		25.23	124.09	0.203	0.00	124.09	0.000
	159 - 158		29.18	124.09	0.235	0.00	124.09	0.000
L2	158 - 156.013	TP29.139x22x0.1875	40.62	420.15	0.097	0.00	420.15	0.000
	156.013 - 154.026		56.52	431.17	0.131	0.00	431.17	0.000
	154.026 - 152.039		73.82	442.26	0.167	0.00	442.26	0.000
	152.039 - 150.053		91.52	453.42	0.202	0.00	453.42	0.000
	150.053 - 148.066		109.67	464.64	0.236	0.00	464.64	0.000
	148.066 - 146.079		128.23	475.93	0.269	0.00	475.93	0.000
	146.079 - 144.092		157.55	487.28	0.323	0.00	487.28	0.000
	144.092 - 142.105		185.89	498.69	0.373	0.00	498.69	0.000
	142.105 - 140.118		214.65	510.15	0.421	0.00	510.15	0.000
	140.118 - 138.132		243.81	521.66	0.467	0.00	521.66	0.000
	138.132 - 136.145		273.38	533.23	0.513	0.00	533.23	0.000
	136.145 - 134.158		303.36	544.84	0.557	0.00	544.84	0.000
	134.158 - 132.171		333.75	556.49	0.600	0.00	556.49	0.000
	132.171 - 130.184		364.56	568.18	0.642	0.00	568.18	0.000
	130.184 - 128.197		395.78	579.91	0.682	0.00	579.91	0.000
	128.197 - 126.211		427.42	591.67	0.722	0.00	591.67	0.000
	126.211 - 124.224		459.47	603.47	0.761	0.00	603.47	0.000
	124.224 - 122.237		491.94	615.29	0.800	0.00	615.29	0.000
	122.237 - 120.25		524.83	627.14	0.837	0.00	627.14	0.000
	120.25 - 116.5		262.99	649.57	0.405	0.00	649.57	0.000
L3	120.25 - 116.5	TP35x28.119x0.25	333.13	937.85	0.355	0.00	937.85	0.000
	116.5 - 114.736		632.59	954.94	0.662	0.00	954.94	0.000
	114.736 - 112.972		669.37	972.12	0.689	0.00	972.12	0.000
	112.972 - 111.208		706.46	989.38	0.714	0.00	989.38	0.000
	111.208 - 109.444		743.87	1006.72	0.739	0.00	1006.72	0.000
	109.444 - 107.681		781.60	1024.13	0.763	0.00	1024.13	0.000
	107.681 - 105.917		819.64	1041.63	0.787	0.00	1041.63	0.000
	105.917 - 104.153		857.98	1059.19	0.810	0.00	1059.19	0.000
	104.153 -		896.64	1076.83	0.833	0.00	1076.83	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	102.389							
	102.389 - 100.625		935.62	1094.53	0.855	0.00	1094.53	0.000
	100.625 - 98.8611		974.89	1112.31	0.876	0.00	1112.31	0.000
	98.8611 - 97.0972		1014.48	1130.15	0.898	0.00	1130.15	0.000
	97.0972 - 95.3333		1054.36	1148.06	0.918	0.00	1148.06	0.000
	95.3333 - 93.5694		1094.55	1166.03	0.939	0.00	1166.03	0.000
	93.5694 - 91.8056		1135.05	1184.05	0.959	0.00	1184.05	0.000
	91.8056 - 90.0417		1175.84	1202.13	0.978	0.00	1202.13	0.000
	90.0417 - 88.2778		1216.94	1220.27	0.997	0.00	1220.27	0.000
	88.2778 - 86.5139		1258.33	1238.46	1.016	0.00	1238.46	0.000
	86.5139 - 84.75		1300.03	1256.70	1.034	0.00	1256.70	0.000
	84.75 - 80.25		643.15	1303.46	0.493	0.00	1303.46	0.000
L4	84.75 - 80.25	TP41.467x33.726x0.3125	764.90	1705.27	0.449	0.00	1705.27	0.000
	80.25 - 78.2917		1455.80	1734.32	0.839	0.00	1734.32	0.000
	78.2917 - 76.3333		1503.92	1763.51	0.853	0.00	1763.51	0.000
	76.3333 - 74.375		1552.39	1792.83	0.866	0.00	1792.83	0.000
	74.375 - 72.4167		1601.33	1822.30	0.879	0.00	1822.30	0.000
	72.4167 - 70.4583		1650.65	1851.90	0.891	0.00	1851.90	0.000
	70.4583 - 68.5		1700.32	1881.63	0.904	0.00	1881.63	0.000
	68.5 - 66.5417		1750.34	1911.49	0.916	0.00	1911.49	0.000
	66.5417 - 64.5833		1800.69	1941.47	0.927	0.00	1941.47	0.000
	64.5833 - 62.625		1851.39	1971.58	0.939	0.00	1971.58	0.000
	62.625 - 60.6667		1902.42	2001.81	0.950	0.00	2001.81	0.000
	60.6667 - 58.7083		1953.77	2032.16	0.961	0.00	2032.16	0.000
	58.7083 - 56.75		2005.45	2062.61	0.972	0.00	2062.61	0.000
	56.75 - 54.7917		2057.45	2093.18	0.983	0.00	2093.18	0.000
	54.7917 - 52.8333		2109.76	2123.86	0.993	0.00	2123.86	0.000
	52.8333 - 50.875		2162.38	2154.64	1.004	0.00	2154.64	0.000
	50.875 - 48.9167		2215.32	2185.53	1.014	0.00	2185.53	0.000
	48.9167 - 46.9583		2268.56	2216.51	1.023	0.00	2216.51	0.000
	46.9583 - 45		2322.09	2247.59	1.033	0.00	2247.59	0.000
	45 - 39.75		1153.04	2331.38	0.495	0.00	2331.38	0.000
L5	45 - 39.75	TP47.68x39.939x0.375	1314.47	2877.82	0.457	0.00	2877.82	0.000
	39.75 - 37.6579		2526.20	2922.19	0.864	0.00	2922.19	0.000
	37.6579 - 35.5658		2585.19	2966.76	0.871	0.00	2966.76	0.000
	35.5658 - 33.4737		2644.47	3011.52	0.878	0.00	3011.52	0.000
	33.4737 - 31.3816		2704.03	3056.47	0.885	0.00	3056.47	0.000
	31.3816 -		2763.87	3101.63	0.891	0.00	3101.63	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	29.2895							
	29.2895 - 27.1974		2823.97	3146.96	0.897	0.00	3146.96	0.000
	27.1974 - 25.1053		2884.32	3192.47	0.903	0.00	3192.47	0.000
	25.1053 - 23.0132		2944.93	3238.18	0.909	0.00	3238.18	0.000
	23.0132 - 20.9211		3005.78	3284.05	0.915	0.00	3284.05	0.000
	20.9211 - 18.8289		3066.85	3330.09	0.921	0.00	3330.09	0.000
	18.8289 - 16.7368		3128.16	3376.31	0.927	0.00	3376.31	0.000
	16.7368 - 14.6447		3189.68	3422.69	0.932	0.00	3422.69	0.000
	14.6447 - 12.5526		3251.40	3469.23	0.937	0.00	3469.23	0.000
	12.5526 - 10.4605		3313.32	3515.94	0.942	0.00	3515.94	0.000
	10.4605 - 8.36842		3375.43	3562.80	0.947	0.00	3562.80	0.000
	8.36842 - 6.27632		3437.73	3609.81	0.952	0.00	3609.81	0.000
	6.27632 - 4.18421		3500.20	3656.97	0.957	0.00	3656.97	0.000
	4.18421 - 2.09211		3562.83	3704.28	0.962	0.00	3704.28	0.000
	2.09211 - 0		3625.63	3751.72	0.966	0.00	3751.72	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	168 - 167	TP14x14x0.25	0.05	102.05	0.001	0.00	123.37	0.000
	167 - 166		0.24	102.05	0.002	0.04	123.37	0.000
	166 - 165		3.30	102.05	0.032	0.32	123.37	0.003
	165 - 164		3.40	102.05	0.033	0.33	123.37	0.003
	164 - 163		3.50	102.05	0.034	0.35	123.37	0.003
	163 - 162		3.60	102.05	0.035	0.36	123.37	0.003
	162 - 161		3.70	102.05	0.036	0.38	123.37	0.003
	161 - 160		3.80	102.05	0.037	0.39	123.37	0.003
	160 - 159		3.90	102.05	0.038	0.40	123.37	0.003
	159 - 158		4.03	102.05	0.039	0.51	123.37	0.004
L2	158 - 156.013	TP29.139x22x0.1875	7.51	231.39	0.032	0.51	448.93	0.001
	156.013 - 154.026		8.62	234.96	0.037	0.10	462.89	0.000
	154.026 - 152.039		8.82	238.53	0.037	0.10	477.06	0.000
	152.039 - 150.053		9.03	242.10	0.037	0.10	491.45	0.000
	150.053 - 148.066		9.23	245.67	0.038	0.10	506.05	0.000
	148.066 - 146.079		9.44	249.24	0.038	0.10	520.86	0.000
	146.079 - 144.092		14.16	252.81	0.056	0.10	535.89	0.000
	144.092 - 142.105		14.37	256.38	0.056	0.10	551.13	0.000
	142.105 - 140.118		14.57	259.95	0.056	0.10	566.59	0.000
	140.118 - 138.132		14.78	263.52	0.056	0.10	582.25	0.000
	138.132 - 136.145		14.99	267.09	0.056	0.10	598.13	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	136.145 - 134.158		15.20	270.66	0.056	0.10	614.23	0.000
	134.158 - 132.171		15.40	274.23	0.056	0.10	630.54	0.000
	132.171 - 130.184		15.61	277.80	0.056	0.10	647.06	0.000
	130.184 - 128.197		15.82	281.37	0.056	0.10	663.80	0.000
	128.197 - 126.211		16.03	284.94	0.056	0.10	680.75	0.000
	126.211 - 124.224		16.24	288.51	0.056	0.10	697.91	0.000
	124.224 - 122.237		16.45	292.07	0.056	0.10	715.29	0.000
	122.237 - 120.25		16.66	295.64	0.056	0.10	732.88	0.000
	120.25 - 116.5		9.84	302.38	0.033	0.55	766.67	0.001
L3	120.25 - 116.5	TP35x28.119x0.25	10.74	397.08	0.027	0.20	991.57	0.000
	116.5 - 114.736		20.77	401.31	0.052	0.75	1012.78	0.001
	114.736 - 112.972		20.95	405.54	0.052	0.75	1034.22	0.001
	112.972 - 111.208		21.13	409.76	0.052	0.75	1055.89	0.001
	111.208 - 109.444		21.31	413.99	0.051	0.75	1077.78	0.001
	109.444 - 107.681		21.49	418.21	0.051	0.75	1099.89	0.001
	107.681 - 105.917		21.66	422.44	0.051	0.75	1122.23	0.001
	105.917 - 104.153		21.84	426.66	0.051	0.75	1144.80	0.001
	104.153 - 102.389		22.02	430.89	0.051	0.75	1167.58	0.001
	102.389 - 100.625		22.19	435.12	0.051	0.75	1190.60	0.001
	100.625 - 98.8611		22.37	439.34	0.051	0.75	1213.83	0.001
	98.8611 - 97.0972		22.54	443.57	0.051	0.75	1237.30	0.001
	97.0972 - 95.3333		22.71	447.79	0.051	0.75	1260.98	0.001
	95.3333 - 93.5694		22.89	452.02	0.051	0.74	1284.89	0.001
	93.5694 - 91.8056		23.06	456.24	0.051	0.74	1309.03	0.001
	91.8056 - 90.0417		23.23	460.47	0.050	0.74	1333.39	0.001
	90.0417 - 88.2778		23.40	464.69	0.050	0.74	1357.97	0.001
	88.2778 - 86.5139		23.57	468.92	0.050	0.74	1382.78	0.001
	86.5139 - 84.75		23.74	473.15	0.050	0.74	1407.82	0.001
	84.75 - 80.25		11.23	483.93	0.023	0.34	1472.70	0.000
L4	84.75 - 80.25	TP41.467x33.726x0.3125	13.07	595.12	0.022	0.40	1781.77	0.000
	80.25 - 78.2917		24.49	600.98	0.041	0.74	1817.06	0.000
	78.2917 - 76.3333		24.68	606.85	0.041	0.74	1852.69	0.000
	76.3333 - 74.375		24.86	612.71	0.041	0.74	1888.67	0.000
	74.375 - 72.4167		25.11	618.57	0.041	0.74	1924.99	0.000
	72.4167 - 70.4583		25.29	624.44	0.041	0.72	1961.67	0.000
	70.4583 -		25.47	630.30	0.040	0.72	1998.68	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	68.5							
	68.5 - 66.5417		25.65	636.17	0.040	0.72	2036.05	0.000
	66.5417 - 64.5833		25.82	642.03	0.040	0.72	2073.76	0.000
	64.5833 - 62.625		25.99	647.89	0.040	0.72	2111.81	0.000
	62.625 - 60.6667		26.16	653.76	0.040	0.72	2150.21	0.000
	60.6667 - 58.7083		26.33	659.62	0.040	0.72	2188.96	0.000
	58.7083 - 56.75		26.49	665.49	0.040	0.72	2228.05	0.000
	56.75 - 54.7917		26.65	671.35	0.040	0.72	2267.49	0.000
	54.7917 - 52.8333		26.82	677.22	0.040	0.72	2307.28	0.000
	52.8333 - 50.875		26.97	683.08	0.039	0.72	2347.41	0.000
	50.875 - 48.9167		27.13	688.94	0.039	0.72	2387.88	0.000
	48.9167 - 46.9583		27.28	694.81	0.039	0.72	2428.71	0.000
	46.9583 - 45		27.44	700.67	0.039	0.72	2469.88	0.000
	45 - 39.75		13.24	716.39	0.018	0.34	2581.96	0.000
L5	45 - 39.75	TP47.68x39.939x0.375	14.78	845.31	0.017	0.38	2995.71	0.000
	39.75 - 37.6579		28.15	852.83	0.033	0.72	3049.23	0.000
	37.6579 - 35.5658		28.29	860.35	0.033	0.72	3103.22	0.000
	35.5658 - 33.4737		28.43	867.87	0.033	0.72	3157.69	0.000
	33.4737 - 31.3816		28.56	875.38	0.033	0.72	3212.63	0.000
	31.3816 - 29.2895		28.69	882.90	0.032	0.72	3268.05	0.000
	29.2895 - 27.1974		28.82	890.42	0.032	0.72	3323.94	0.000
	27.1974 - 25.1053		28.94	897.94	0.032	0.72	3380.31	0.000
	25.1053 - 23.0132		29.06	905.45	0.032	0.72	3437.14	0.000
	23.0132 - 20.9211		29.17	912.97	0.032	0.72	3494.46	0.000
	20.9211 - 18.8289		29.28	920.49	0.032	0.72	3552.24	0.000
	18.8289 - 16.7368		29.39	928.01	0.032	0.72	3610.50	0.000
	16.7368 - 14.6447		29.49	935.52	0.032	0.72	3669.23	0.000
	14.6447 - 12.5526		29.59	943.04	0.031	0.72	3728.44	0.000
	12.5526 - 10.4605		29.68	950.56	0.031	0.72	3788.13	0.000
	10.4605 - 8.36842		29.77	958.08	0.031	0.72	3848.28	0.000
	8.36842 - 6.27632		29.86	965.60	0.031	0.72	3908.91	0.000
	6.27632 - 4.18421		29.94	973.11	0.031	0.72	3970.01	0.000
	4.18421 - 2.09211		30.02	980.63	0.031	0.72	4031.58	0.000
	2.09211 - 0		30.09	988.15	0.030	0.72	4093.64	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	168 - 167	0.001	0.001	0.000	0.001	0.000	0.001	1.050	4.8.2
	167 - 166	0.000	0.002	0.000	0.002	0.000	0.003	1.050	4.8.2
	166 - 165	0.004	0.030	0.000	0.032	0.003	0.035	1.050	4.8.2
	165 - 164	0.004	0.057	0.000	0.033	0.003	0.062	1.050	4.8.2
	164 - 163	0.004	0.084	0.000	0.034	0.003	0.090	1.050	4.8.2
	163 - 162	0.004	0.113	0.000	0.035	0.003	0.119	1.050	4.8.2
	162 - 161	0.005	0.142	0.000	0.036	0.003	0.148	1.050	4.8.2
	161 - 160	0.005	0.172	0.000	0.037	0.003	0.179	1.050	4.8.2
	160 - 159	0.005	0.203	0.000	0.038	0.003	0.210	1.050	4.8.2
	159 - 158	0.005	0.235	0.000	0.039	0.004	0.242	1.050	4.8.2
L2	158 - 156.013	0.005	0.097	0.000	0.032	0.001	0.103	1.050	4.8.2
	156.013 - 154.026	0.006	0.131	0.000	0.037	0.000	0.138	1.050	4.8.2
	154.026 - 152.039	0.006	0.167	0.000	0.037	0.000	0.174	1.050	4.8.2
	152.039 - 150.053	0.006	0.202	0.000	0.037	0.000	0.209	1.050	4.8.2
	150.053 - 148.066	0.006	0.236	0.000	0.038	0.000	0.243	1.050	4.8.2
	148.066 - 146.079	0.006	0.269	0.000	0.038	0.000	0.277	1.050	4.8.2
	146.079 - 144.092	0.008	0.323	0.000	0.056	0.000	0.335	1.050	4.8.2
	144.092 - 142.105	0.008	0.373	0.000	0.056	0.000	0.384	1.050	4.8.2
	142.105 - 140.118	0.008	0.421	0.000	0.056	0.000	0.432	1.050	4.8.2
	140.118 - 138.132	0.008	0.467	0.000	0.056	0.000	0.479	1.050	4.8.2
	138.132 - 136.145	0.009	0.513	0.000	0.056	0.000	0.524	1.050	4.8.2
	136.145 - 134.158	0.009	0.557	0.000	0.056	0.000	0.569	1.050	4.8.2
	134.158 - 132.171	0.009	0.600	0.000	0.056	0.000	0.612	1.050	4.8.2
	132.171 - 130.184	0.009	0.642	0.000	0.056	0.000	0.654	1.050	4.8.2
	130.184 - 128.197	0.009	0.682	0.000	0.056	0.000	0.695	1.050	4.8.2
	128.197 - 126.211	0.009	0.722	0.000	0.056	0.000	0.735	1.050	4.8.2
	126.211 - 124.224	0.009	0.761	0.000	0.056	0.000	0.774	1.050	4.8.2
	124.224 - 122.237	0.009	0.800	0.000	0.056	0.000	0.812	1.050	4.8.2
	122.237 - 120.25	0.009	0.837	0.000	0.056	0.000	0.849	1.050	4.8.2
	120.25 - 116.5	0.006	0.405	0.000	0.033	0.001	0.412	1.050	4.8.2
L3	120.25 - 116.5	0.005	0.355	0.000	0.027	0.000	0.361	1.050	4.8.2
	116.5 - 114.736	0.009	0.662	0.000	0.052	0.001	0.675	1.050	4.8.2
	114.736 - 112.972	0.010	0.689	0.000	0.052	0.001	0.701	1.050	4.8.2
	112.972 - 111.208	0.010	0.714	0.000	0.052	0.001	0.727	1.050	4.8.2
	111.208 - 109.444	0.010	0.739	0.000	0.051	0.001	0.751	1.050	4.8.2
	109.444 - 107.681	0.010	0.763	0.000	0.051	0.001	0.776	1.050	4.8.2
	107.681 - 105.917	0.010	0.787	0.000	0.051	0.001	0.800	1.050	4.8.2
	105.917 - 104.153	0.010	0.810	0.000	0.051	0.001	0.823	1.050	4.8.2
	104.153 -	0.010	0.833	0.000	0.051	0.001	0.846	1.050	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	102.389								
	102.389 - 100.625	0.010	0.855	0.000	0.051	0.001	0.868	1.050	4.8.2
	100.625 - 98.8611	0.011	0.876	0.000	0.051	0.001	0.890	1.050	4.8.2
	98.8611 - 97.0972	0.011	0.898	0.000	0.051	0.001	0.911	1.050	4.8.2
	97.0972 - 95.3333	0.011	0.918	0.000	0.051	0.001	0.932	1.050	4.8.2
	95.3333 - 93.5694	0.011	0.939	0.000	0.051	0.001	0.952	1.050	4.8.2
	93.5694 - 91.8056	0.011	0.959	0.000	0.051	0.001	0.972	1.050	4.8.2
	91.8056 - 90.0417	0.011	0.978	0.000	0.050	0.001	0.992	1.050	4.8.2
	90.0417 - 88.2778	0.011	0.997	0.000	0.050	0.001	1.011	1.050	4.8.2
	88.2778 - 86.5139	0.011	1.016	0.000	0.050	0.001	1.030	1.050	4.8.2
	86.5139 - 84.75	0.012	1.034	0.000	0.050	0.001	1.049	1.050	4.8.2
	84.75 - 80.25	0.006	0.493	0.000	0.023	0.000	0.499	1.050	4.8.2
L4	84.75 - 80.25	0.005	0.449	0.000	0.022	0.000	0.454	1.050	4.8.2
	80.25 - 78.2917	0.010	0.839	0.000	0.041	0.000	0.851	1.050	4.8.2
	78.2917 - 76.3333	0.010	0.853	0.000	0.041	0.000	0.865	1.050	4.8.2
	76.3333 - 74.375	0.010	0.866	0.000	0.041	0.000	0.878	1.050	4.8.2
	74.375 - 72.4167	0.011	0.879	0.000	0.041	0.000	0.891	1.050	4.8.2
	72.4167 - 70.4583	0.011	0.891	0.000	0.041	0.000	0.904	1.050	4.8.2
	70.4583 - 68.5	0.011	0.904	0.000	0.040	0.000	0.916	1.050	4.8.2
	68.5 - 66.5417	0.011	0.916	0.000	0.040	0.000	0.928	1.050	4.8.2
	66.5417 - 64.5833	0.011	0.927	0.000	0.040	0.000	0.940	1.050	4.8.2
	64.5833 - 62.625	0.011	0.939	0.000	0.040	0.000	0.952	1.050	4.8.2
	62.625 - 60.6667	0.012	0.950	0.000	0.040	0.000	0.964	1.050	4.8.2
	60.6667 - 58.7083	0.012	0.961	0.000	0.040	0.000	0.975	1.050	4.8.2
	58.7083 - 56.75	0.012	0.972	0.000	0.040	0.000	0.986	1.050	4.8.2
	56.75 - 54.7917	0.012	0.983	0.000	0.040	0.000	0.997	1.050	4.8.2
	54.7917 - 52.8333	0.012	0.993	0.000	0.040	0.000	1.007	1.050	4.8.2
	52.8333 - 50.875	0.012	1.004	0.000	0.039	0.000	1.018	1.050	4.8.2
	50.875 - 48.9167	0.013	1.014	0.000	0.039	0.000	1.028	1.050	4.8.2
	48.9167 - 46.9583	0.013	1.023	0.000	0.039	0.000	1.038	1.050	4.8.2
	46.9583 - 45	0.013	1.033	0.000	0.039	0.000	1.048	1.050	4.8.2
	45 - 39.75	0.006	0.495	0.000	0.018	0.000	0.501	1.050	4.8.2
L5	45 - 39.75	0.006	0.457	0.000	0.017	0.000	0.463	1.050	4.8.2
	39.75 - 37.6579	0.012	0.864	0.000	0.033	0.000	0.877	1.050	4.8.2
	37.6579 - 35.5658	0.012	0.871	0.000	0.033	0.000	0.884	1.050	4.8.2
	35.5658 - 33.4737	0.012	0.878	0.000	0.033	0.000	0.891	1.050	4.8.2
	33.4737 - 31.3816	0.012	0.885	0.000	0.033	0.000	0.898	1.050	4.8.2
	31.3816 -	0.012	0.891	0.000	0.032	0.000	0.905	1.050	4.8.2

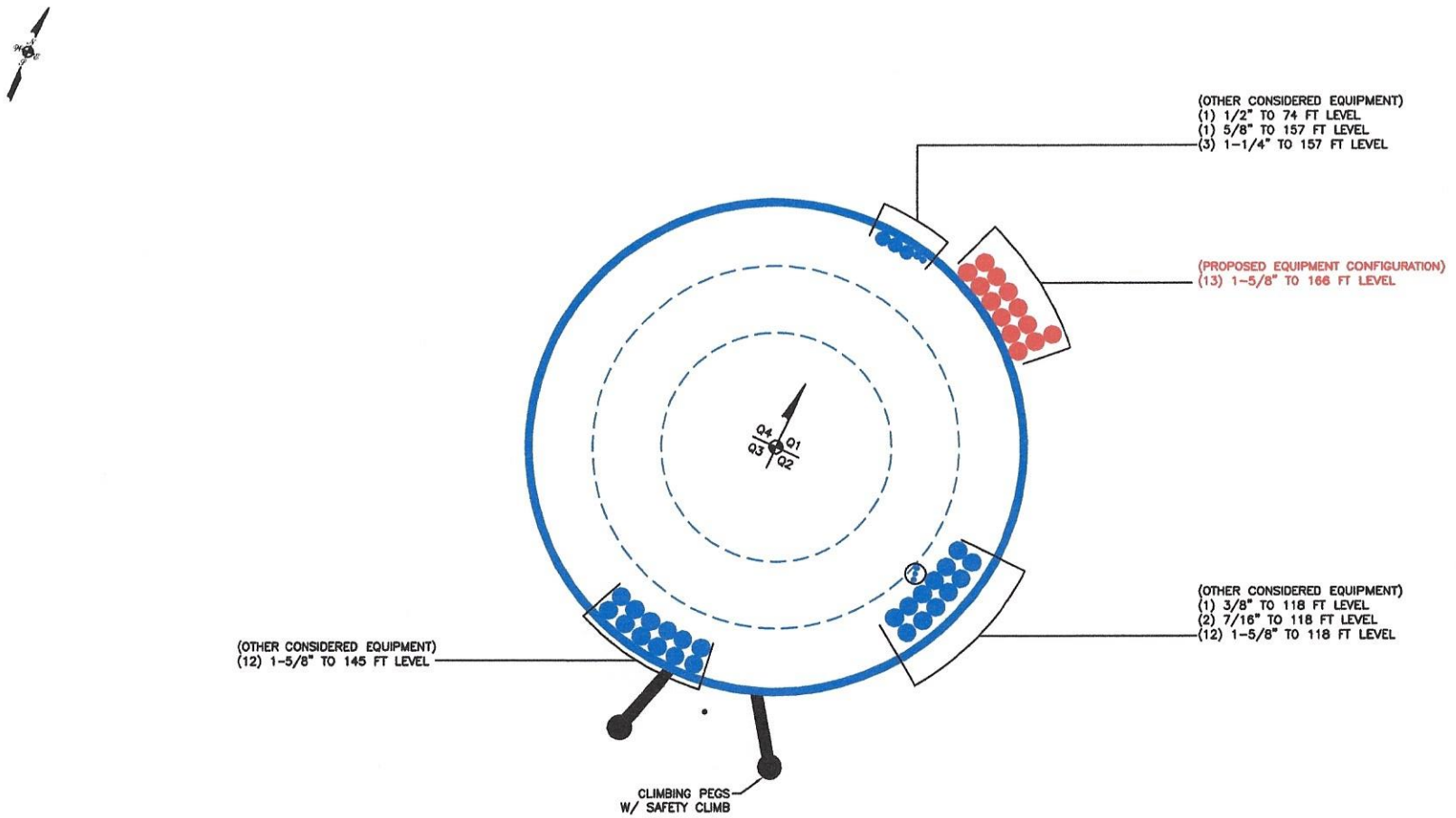
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	29.2895								
	29.2895 - 27.1974	0.013	0.897	0.000	0.032	0.000	0.911	1.050	4.8.2
	27.1974 - 25.1053	0.013	0.903	0.000	0.032	0.000	0.917	1.050	4.8.2
	25.1053 - 23.0132	0.013	0.909	0.000	0.032	0.000	0.923	1.050	4.8.2
	23.0132 - 20.9211	0.013	0.915	0.000	0.032	0.000	0.929	1.050	4.8.2
	20.9211 - 18.8289	0.013	0.921	0.000	0.032	0.000	0.935	1.050	4.8.2
	18.8289 - 16.7368	0.013	0.927	0.000	0.032	0.000	0.941	1.050	4.8.2
	16.7368 - 14.6447	0.014	0.932	0.000	0.032	0.000	0.947	1.050	4.8.2
	14.6447 - 12.5526	0.014	0.937	0.000	0.031	0.000	0.952	1.050	4.8.2
	12.5526 - 10.4605	0.014	0.942	0.000	0.031	0.000	0.957	1.050	4.8.2
	10.4605 - 8.36842	0.014	0.947	0.000	0.031	0.000	0.962	1.050	4.8.2
	8.36842 - 6.27632	0.014	0.952	0.000	0.031	0.000	0.968	1.050	4.8.2
	6.27632 - 4.18421	0.014	0.957	0.000	0.031	0.000	0.972	1.050	4.8.2
	4.18421 - 2.09211	0.015	0.962	0.000	0.031	0.000	0.977	1.050	4.8.2
	2.09211 - 0	0.015	0.966	0.000	0.030	0.000	0.982	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	168 - 158	Pole	TP14x14x0.25	1	-1.66	357.18	23.0	Pass
L2	158 - 116.5	Pole	TP29.139x22x0.1875	2	-9.26	1034.76	80.9	Pass
L3	116.5 - 80.25	Pole	TP35x28.119x0.25	3	-18.28	1656.01	99.9	Pass
L4	80.25 - 39.75	Pole	TP41.467x33.726x0.3125	4	-30.14	2452.35	99.8	Pass
L5	39.75 - 0	Pole	TP47.68x39.939x0.375	5	-48.36	3458.52	93.5	Pass
							Summary	
						Pole (L3)	99.9	Pass
						RATING =	**99.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 74 FT LEVEL
(1) 5/8" TO 157 FT LEVEL
(3) 1-1/4" TO 157 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(13) 1-5/8" TO 166 FT LEVEL
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 118 FT LEVEL
(2) 7/16" TO 118 FT LEVEL
(12) 1-5/8" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 145 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

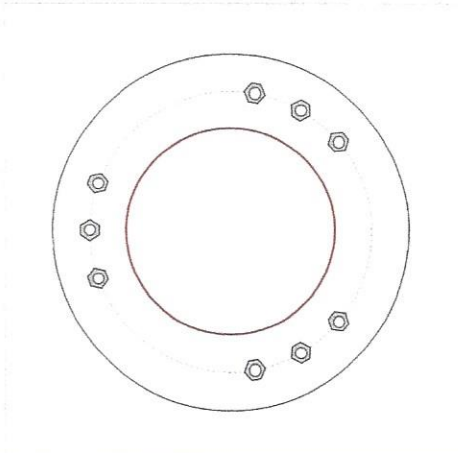
Elevation = 158 ft.

BU #	876392
Site Name	ARTFORD / EXECUTIVE
Order #	479857, Rev. 4
TIA-222 Revision	H

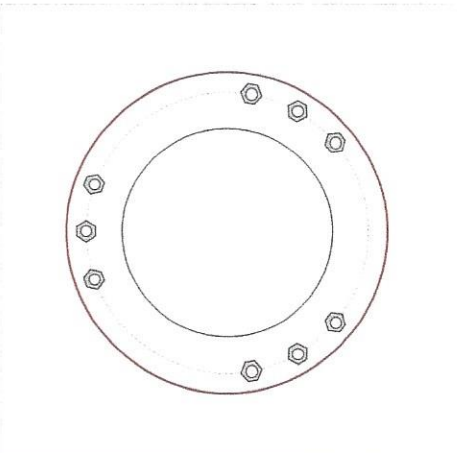
Applied Loads	
Moment (kip-ft)	29.18
Axial Force (kips)	1.66
Shear Force (kips)	4.03

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(9) 3/4" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 19" BC

Top Plate Data

24" OD x 1.25" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

14.125" ID x 0.75" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

14" x 0.25" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

22" x 0.1875" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	8.00	
Allowable (kips)	30.05	
Stress Rating:	**25.4%**	Pass

Top Plate Capacity

Max Stress (ksi):	10.22	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**21.6%**	Pass
Tension Side Stress Rating:	**17.4%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	20.49	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**60.2%**	Pass
Tension Side Stress Rating:	**N/A**	

CCIplate

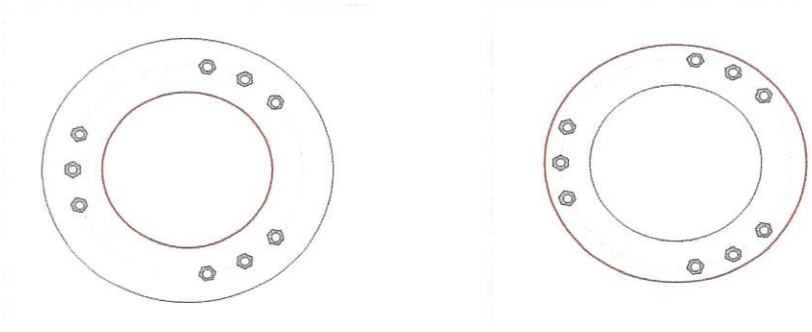
Elevation (ft)	158	*(Flange)*

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending
1	Yes	Yes	Yes

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	l_{sr} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	40	0.75	A325	19	0.5	0	N-Included		No
2	1	60	0.75	A325	19	0.5	0	N-Included		No
3	1	80	0.75	A325	19	0.5	0	N-Included		No
4	1	160	0.75	A325	19	0.5	0	N-Included		No
5	1	180	0.75	A325	19	0.5	0	N-Included		No
6	1	200	0.75	A325	19	0.5	0	N-Included		No
7	1	280	0.75	A325	19	0.5	0	N-Included		No
8	1	300	0.75	A325	19	0.5	0	N-Included		No
9	1	320	0.75	A325	19	0.5	0	N-Included		No

Plot Graphic



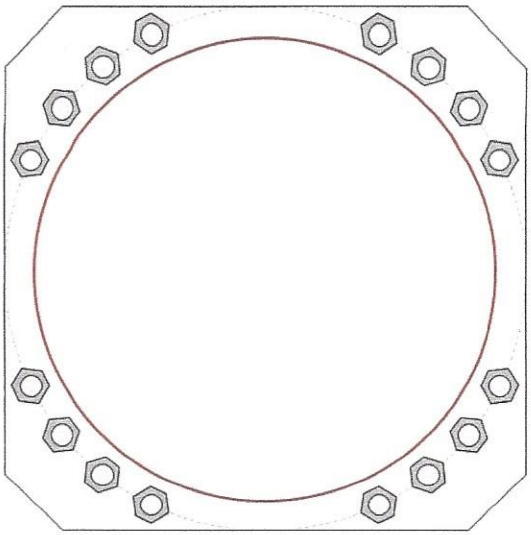
Monopole Base Plate Connection

Site Info	
BU #	876392
Site Name	ARTFORD / EXECUTIVE
Order #	479857, Rev. 4

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.25

Applied Loads	
Moment (kip-ft)	3625.63
Axial Force (kips)	48.36
Shear Force (kips)	30.09

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 54" BC

Anchor Spacing: 6 in

Base Plate Data

54" W x 2.5" Plate (A572-55; Fy=55 ksi, Fu=70 ksi); Clip: 6 in

Stiffener Data

N/A

Pole Data

47.68" x 0.375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 204.3	ϕPn_c = 268.39	**Stress Rating**
Vu = 1.88	ϕVn = 120.77	**72.5%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	41.49	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**79.8%**	**Pass**

Pier and Pad Foundation

BU # :	876392
Site Name:	NEW HARTFORD
App. Number:	479857, Rev. 4

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	48	kips
Base Shear, Vu_comp:	30	kips
Moment, M_u:	3626	ft-kips
Tower Height, **H**:	168	ft
BP Dist. Above Fdn, bp_{dist}:	3.5	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	24	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	21	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	10	ft
Pad Width, W_1:	21	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	9	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	25	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	21	
Base Friction, μ:		
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	343.18	30.00	**8.3%**	**Pass**
Bearing Pressure (ksf)	9.00	3.58	**39.7%**	**Pass**
*Overturning (kip*ft)*	6309.92	3949.75	**62.6%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5871.80	3851.00	**62.5%**	**Pass**
Pier Compression (kip)	23390.64	114.15	**0.5%**	**Pass**
*Pad Flexure (kip*ft)*	3390.85	1421.80	**39.9%**	**Pass**
Pad Shear - 1-way (kips)	648.20	260.75	**38.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.040	**22.9%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5107.10	2310.60	**43.1%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**62.6%**
Structural Rating*:	**62.5%**

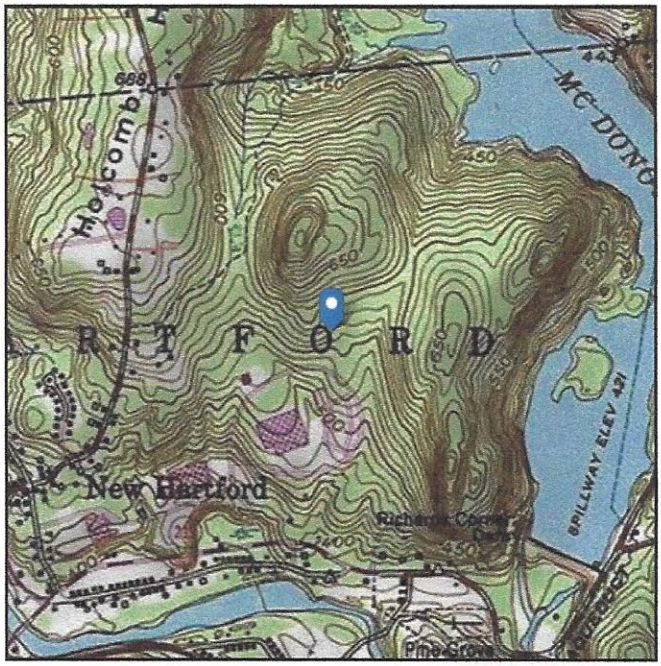
Version 4.0.1

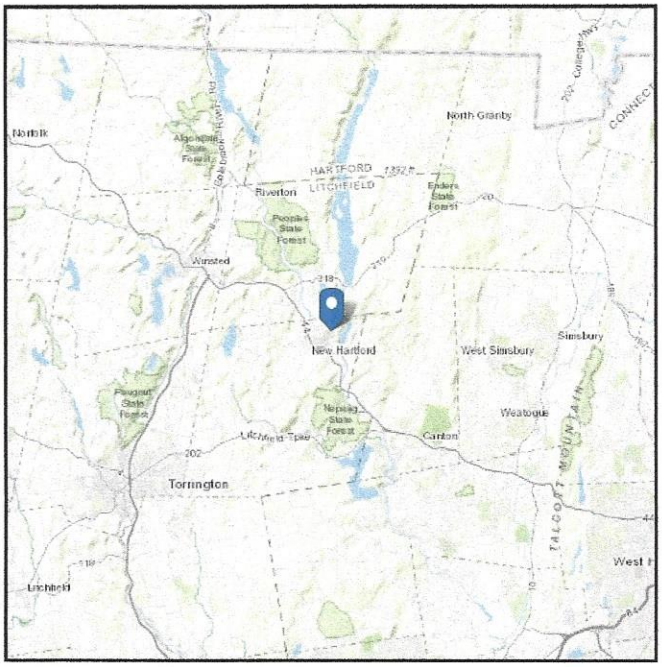
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 566.99 ft (NAVD 88)
Latitude: 41.886244
Longitude: -72.966139





Wind

Results:

Wind Speed:	118 Vmph	*New Hartford Design Wind Speed for Risk Category II: 120 mph
10-year MRI	76 Vmph	
25-year MRI	85 Vmph	
50-year MRI	90 Vmph	
100-year MRI	97 Vmph	

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Mon Dec 07 2020

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

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

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

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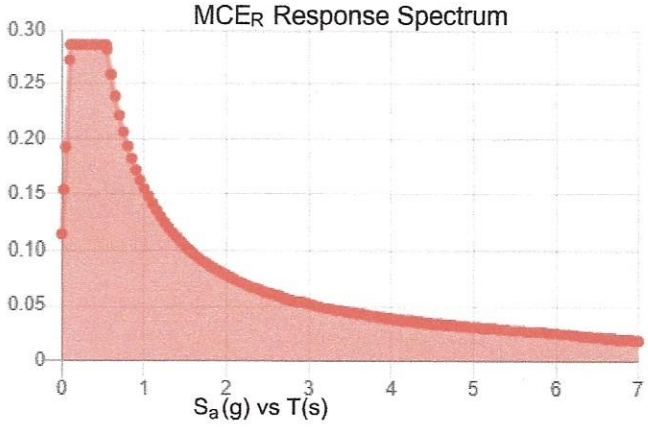
Seismic

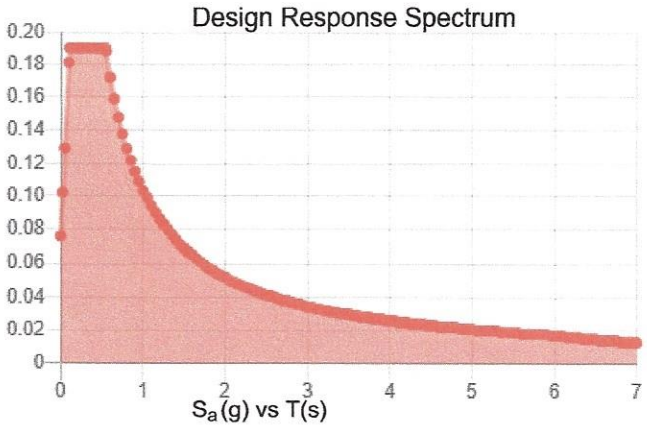
Site Soil Class: D - Stiff Soil

Results: *New Hartford MCE Spectral Accelerations

S_S :	0.178	0.180	S_{DS} :	0.19
S_1 :	0.065	0.065	S_{D1} :	0.103
F_a :	1.6		T_L :	6
F_v :	2.4		PGA :	0.089
S_{MS} :	0.286		PGA_M :	0.142
S_{M1} :	0.155		F_{PGA} :	1.6
			I_e :	1

Seismic Design Category B





Data Accessed: Mon Dec 07 2020

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

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Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Dec 07 2020

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

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

Date: **December 2, 2020**

Kevin Morrow
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6619

Kimley-Horn and Associates, Inc.
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000
CrownMounts@kimley-horn.com

Subject:	**Mount Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CTNH414A
	Carrier Site Name:	Litchfield 10
Crown Castle Designation:	**Crown Castle BU Number:**	876392
	Crown Castle Site Name:	NEW HARTFORD / EXECUTIVE GREET
	Crown Castle JDE Job Number:	559339
	Crown Castle Order Number:	479857, Rev. 4
Engineering Firm Designation:	**Kimley-Horn Report Designation:**	019558051
Site Data:	**115 Industrial Park Road, New Hartford, Litchfield County, CT 06057**	
	Latitude 41° 53' 10.48" Longitude -72° 57' 58.10"	
Structure Information:	**Tower Height & Type:**	**168 ft Monopole**
	Mount Elevation:	**166 ft**
	Mount Type:	**5 ft T-Frames**

Dear Kevin Morrow,

Kimley-Horn is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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

T-Frames **Sufficient ***

***Sufficient capacity once changes described in Section 4.1 Recommendations of this report are completed.**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code and Appendix N based upon an ultimate 3-second gust wind speed of 120 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jesse Schnurman, E.I. under the supervision of Steven C. Ball, P.E., S.E.

Respectfully Submitted by:

Steven C. Ball, P.E., S.E.

12.3.20

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3.2) Assumptions

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Wire Frame and Rendered Models

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Software Input Calculations

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Software Analysis Output

8) APPENDIX D
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9) APPENDIX E
Supplemental Drawings

1) INTRODUCTION

The mounting configuration consists of (3) existing 5 ft T-Frames designed by Site Pro 1 with a proposed support rail kit.

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code and Appendix N
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.184
Seismic S_1:	0.065
Live Loading Wind Speed:	30 mph
Man Live Load at Mount Pipes:	500 lb

Table 1 – Proposed Equipment Configuration

Elevation (ft)		Antennas			Mount / Modification Details
Mount	**Centerline**	**#**	**Manufacturer**	**Model**	
166	166	3	RFS Celwave	APXVAALL24_43-U-NA20_TMO	5 ft T-Arms designed by Site Pro 1 w/ proposed support rail kit
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20	
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE	
		3	Ericsson	KRY 112 489/2	
		3	Ericsson	KRY 112 144/1	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Supplemental Loading	T-Mobile RFDS	9/10/2020	TSA
Site Photos	-	-	CCISites
Mount Analysis Report	Kimley-Horn	8472847	CCISites

3.1) Analysis Method

RISA-3D (version 17.02.00), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A proprietary tool internally developed by Kimley-Horn was used to calculate wind loading on all appurtenances, dishes and mount members for various load cases. Selected output from the analysis is included in Appendix B.

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

3.2) Assumptions

1) The antenna mounting system (including any considered modifications) was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA standards, and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the provided reference information.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members that could not be verified at this time.
5) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (Gr. 36)
HSS (Rectangular)	ASTM A36 (Gr. 36)
Pipe	ASTM A53 (Gr. B-35)
Threaded Rods	ASTM A36 (Gr. 36)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1	Mount Pipes	M5	166	57%	Pass
1	Face Horizontals	M3		35%	Pass
2	Connections	-		25%	Pass
1	Stand Off Horizontals	M45		16%	Pass

Structure Rating (max from all components) =	57%

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

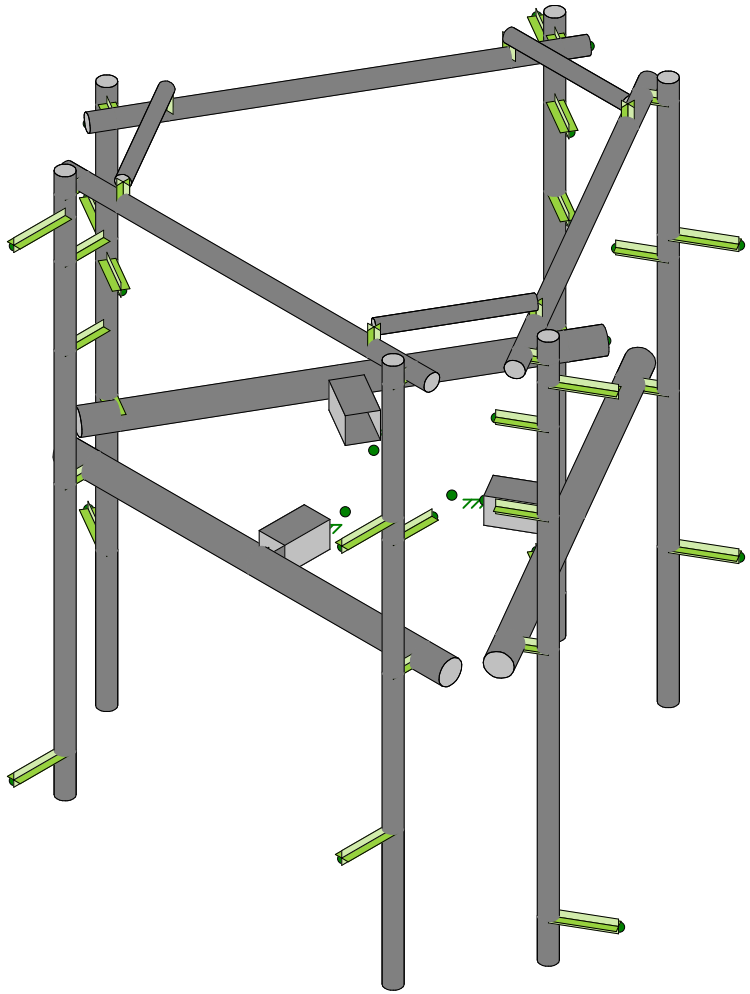
4.1) Recommendations

The mounting configuration will have sufficient design capacity to carry the referenced loading once the following modifications are completed:

- **Existing mount assumed to be (3) Site Pro 1 RDS-284 T-Arms per previous analysis by Kimley-Horn (CCISites Doc #8472847)**
- **Install NeWave Face Frame Stiffener Kit 3" below top mount pipe end. Triangulated pipes to be 9" from member ends, field cut to length. See appendix E.**
    - **(1) NeWave FSK-126-X22**

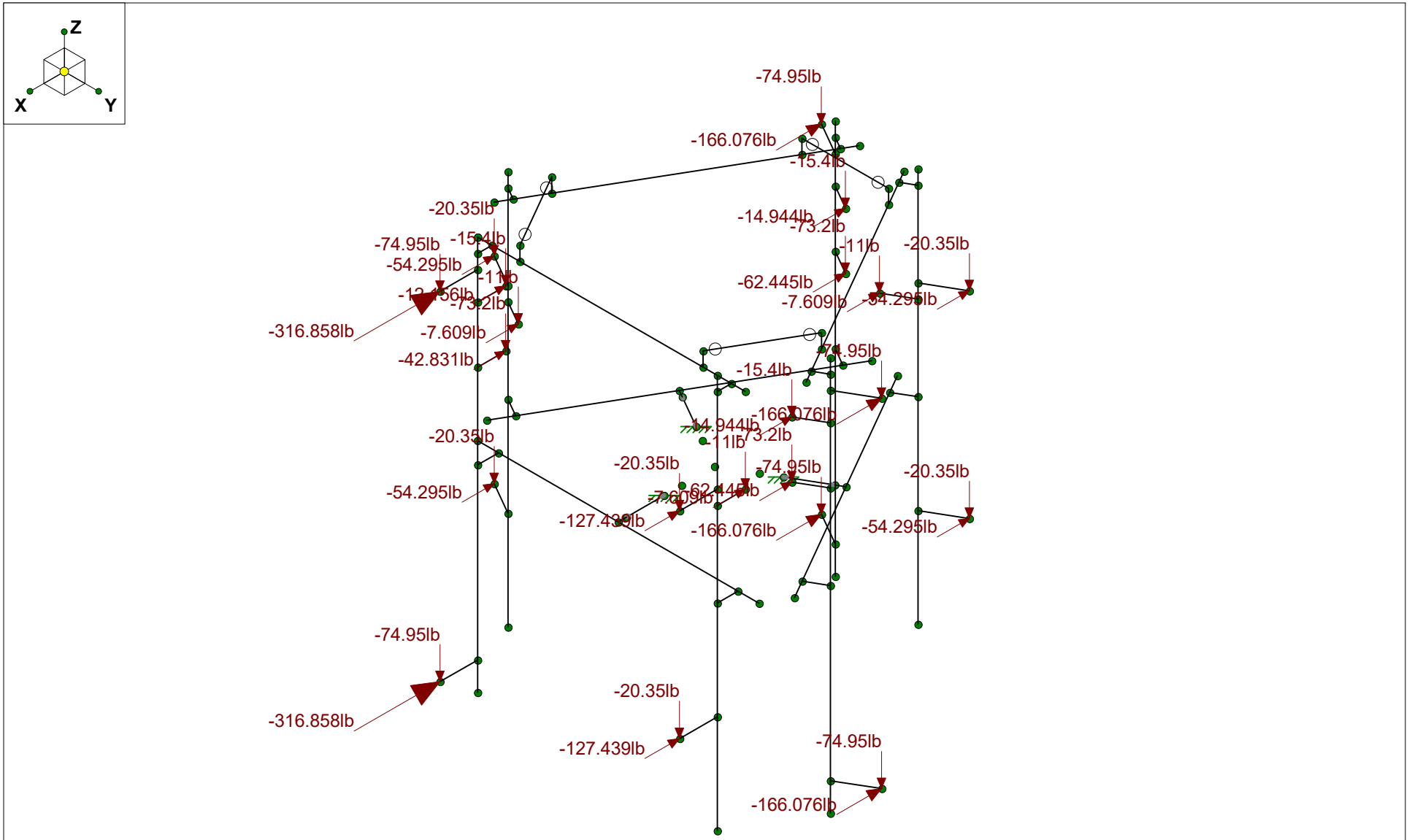
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Kimley-Horn and Associates, Inc.		SK - 1
JSS	876392	Dec 2, 2020 at 10:36 AM
019558051	3D Rendering	RDS-284.r3d



Loads: LC 1, Summary: 1.0D + 1.0W
Envelope Only Solution

Kimley-Horn and Associates, Inc.		SK - 2
JSS	876392	Dec 2, 2020 at 10:36 AM
019558051	Wind Load Summary	RDS-284.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

General Criteria	
TIA Standard	H
IBC Edition	2018
Structure Class	-
Risk Category	II

Site-Specific Criteria	
Exposure Category	C
Topographic Factor, K_{zt}	1.00
Structure Base Elev. (AMSL), z_s (ft)	567.00
Ground Effect Factor, K_e	0.98

Mount & Structure Criteria	
Mount Elevation (AGL) (ft)	166.00
Structure Height (ft)	168.00
Structure Type	Monopole

Constants	
Wind Direction Probability Factor, K_d	0.95
Gust Effect Factor, G_h	1
Shielding Factor, K_a **(antenna)**	0.9
Shielding Factor, K_a **(mount)**	0.9

Wind Summary	
Basic Wind Speed w/o Ice, **V** (mph)	120.00
Velocity Pressure Coeff., K_z	1.41
Velocity Pressure, q_z **(w/o Ice)** (psf)	48.31

Ice Load Summary	
Basic Wind Speed w/ Ice, V_i (mph)	50.00
Design Ice Thick. (ASCE 7-16) , t_i (in)	1.5
Velocity Pressure, q_z **(w/ Ice)** (psf)	8.39
Escalated Ice Thick. @ Mount, t_{iz} (in)	1.76

Seismic Load Summary	
Spectral Response (Short Periods), S_s	0.184
Spectral Response (1-Sec. Period), S_1	0.065
Site Class	D
Seismic Design Category	B
Seismic Risk Category	II

Snow Load Summary	
Ground Snow Load, p_g (psf)	-
Snow Load on Flat Roofs, p_f (psf)	-

Kimley»Horn

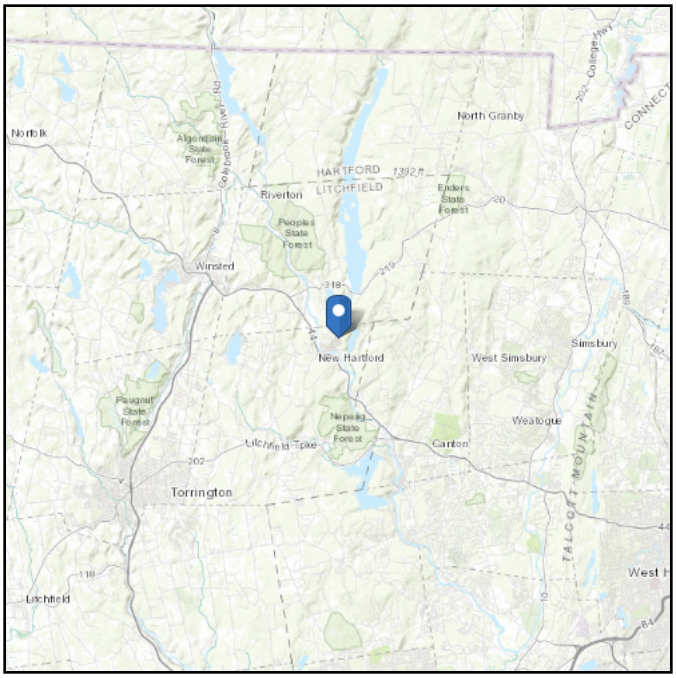
Date	December 02, 2020
Client	Crown Castle
Site #	876392
Site Name	NEW HARTFORD / EXECUTIVE GREET
Project #	19558051

Antenna Name	Qty	Shape	Dimensions (in)			Weight (lb)	Joint Labels								EPA (ft²)		Wind Force, F_A (lb)			
																	No Ice		With Ice	
			H	W	D		Alpha		Beta		Gamma		Delta		Front	Side	Front	Side	Front	Side
APX16DWV-16DWV-S-E-A20	3	Flat	55.9	13.3	3.2	40.7	A1T	A1B	B1T	B1B	G1T	G1B			5.86	1.38	254.88	59.83	58.12	19.48
APXVAALL24_43-U-NA20_TMO	3	Flat	95.9	24	8.5	149.9	A2T	A2B	B2T	B2B	G2T	G2B			14.57	5.33	633.72	231.63	129.06	55.14
KRY 112 144/1	3	Flat	7	6	3	11	A1R		B1R		G1R				0.18	0.18	7.61	7.61	3.15	4.32
KRY 112 489/2	3	Flat	11	6.1	3.9	15.4	A2R_1		B2R_1		G2R_1				0.28	0.37	12.16	15.87	4.4	6.82
RADIO 4449 B71 B85A_T-MOBILE	3	Flat	17.9	13.2	10.6	73.2	A2R_2		B2R_2		G2R_2				0.99	1.59	42.83	68.98	11.28	19.09

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Elevation:**	566.99 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.886244
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-72.966139



Wind

Results:

Wind Speed: 120 mph - State Requirement

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Wed Dec 02 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

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

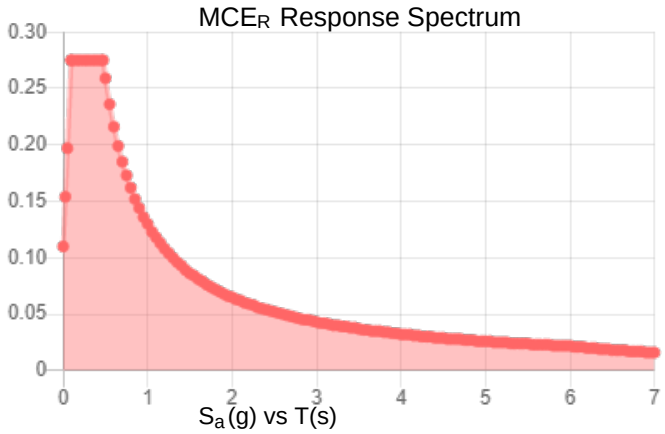
Seismic

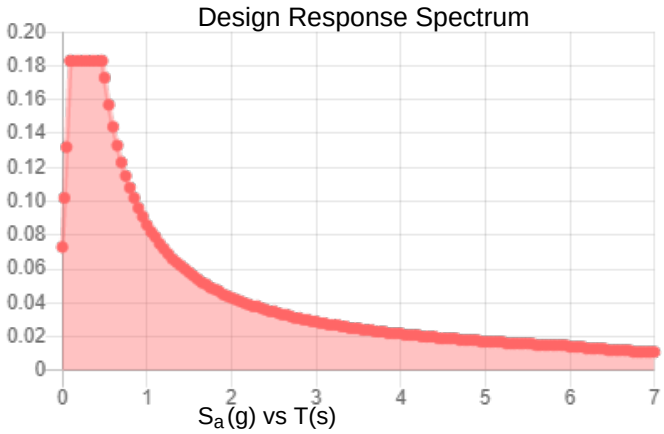
Site Soil Class: D - Default (see Section 11.4.3)

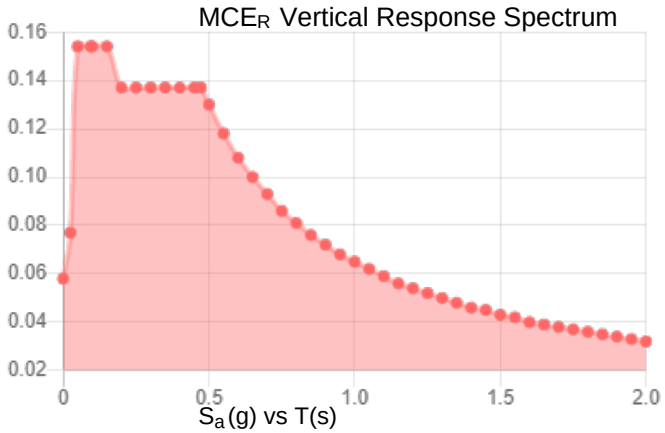
Results:

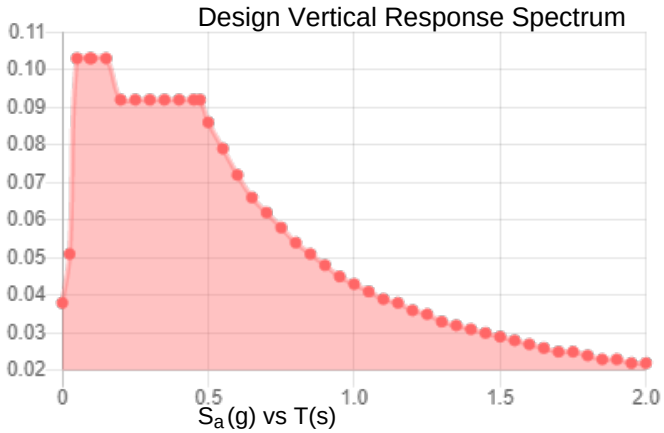
S_S :	0.184 - State Requirement	S_{D1} :	0.086
S_1 :	0.065 - State Requirement	T_L :	6
F_a :	1.6	PGA :	0.09
F_v :	2.4	PGA_M :	0.144
S_{MS} :	0.275	F_{PGA} :	1.6
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.183	C_v :	0.7

Seismic Design Category B









Data Accessed: Wed Dec 02 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Dec 02 2020

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[lb/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Stand-Off Horiz	HSS4X4X3	Beam	None	A500 Gr...	Typical	2.58	6.21	6.21	10
2	Face Horiz	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Mount Pipe	PIPE_2.0	Column	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	FSK-126-X22: Front Face	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	FSK-126-X22: Triangulated Pipe	PIPE_1.5	Beam	None	A53 Gr.B	Typical	.749	.293	.293	.586

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Stand-Off H...	8			Lbyy						Lateral
2	M3	Face Horiz	60			Lbyy						Lateral
3	M5	Mount Pipe	84									Lateral
4	M10	Mount Pipe	84									Lateral
5	M15	Stand-Off H...	8			Lbyy						Lateral
6	M17	Face Horiz	60			Lbyy						Lateral
7	M19	Mount Pipe	84									Lateral
8	M24	Mount Pipe	84									Lateral
9	M29	Stand-Off H...	8			Lbyy						Lateral
10	M31	Face Horiz	60			Lbyy						Lateral
11	M33	Mount Pipe	84									Lateral
12	M38	Mount Pipe	84									Lateral
13	M45	FSK-126-X2...	57			Lbyy						Lateral
14	M50	FSK-126-X2...	57			Lbyy						Lateral
15	M55	FSK-126-X2...	57			Lbyy						Lateral
16	M58	FSK-126-X2...	18.449			Lbyy						Lateral
17	M59	FSK-126-X2...	18.449			Lbyy						Lateral
18	M60	FSK-126-X2...	18.449			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Dead	DL			-1	21				
2	Dead of Ice	RL				21		18		
4	Structure Wind (0)	None						36		
5	Structure Wind (30)	None						36		
6	Structure Wind (45)	None						36		
7	Structure Wind (60)	None						36		
8	Structure Wind (90)	None						36		
9	Structure Wind (120)	None						36		
10	Structure Wind (135)	None						36		
11	Structure Wind (150)	None						36		
12	Structure Wind w/ Ice (0)	None						36		
13	Structure Wind w/ Ice (30)	None						36		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
14	Structure Wind w/ Ice (45)	None						36		
15	Structure Wind w/ Ice (60)	None						36		
16	Structure Wind w/ Ice (90)	None						36		
17	Structure Wind w/ Ice (120)	None						36		
18	Structure Wind w/ Ice (135)	None						36		
19	Structure Wind w/ Ice (150)	None						36		
20	Antenna Wind (0)	None				42				
21	Antenna Wind (30)	None				42				
22	Antenna Wind (45)	None				42				
23	Antenna Wind (60)	None				42				
24	Antenna Wind (90)	None				42				
25	Antenna Wind (120)	None				42				
26	Antenna Wind (135)	None				42				
27	Antenna Wind (150)	None				42				
28	Antenna Wind w/ Ice (0)	None				42				
29	Antenna Wind w/ Ice (30)	None				42				
30	Antenna Wind w/ Ice (45)	None				42				
31	Antenna Wind w/ Ice (60)	None				42				
32	Antenna Wind w/ Ice (90)	None				42				
33	Antenna Wind w/ Ice (120)	None				42				
34	Antenna Wind w/ Ice (135)	None				42				
35	Antenna Wind w/ Ice (150)	None				42				
36	Seismic X	ELX				21		18		
37	Seismic Y	ELY				21		18		
38	Maintenance Live Lm (1)	OL1				1				
39	Maintenance Live Lm (2)	OL2				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	Summary: 1.0D + 1.0W	Yes	Y		DL	1	20	1																		
2	1.4D	Yes	Y		DL	1.4																				
3	1.2D + 1.0W(0)	Yes	Y		DL	1.2	4	1	20	1																
4	1.2D + 1.0W(30)	Yes	Y		DL	1.2	5	1	21	1																
5	1.2D + 1.0W(45)	Yes	Y		DL	1.2	6	1	22	1																
6	1.2D + 1.0W(60)	Yes	Y		DL	1.2	7	1	23	1																
7	1.2D + 1.0W(90)	Yes	Y		DL	1.2	8	1	24	1																
8	1.2D + 1.0W(120)	Yes	Y		DL	1.2	9	1	25	1																
9	1.2D + 1.0W(135)	Yes	Y		DL	1.2	10	1	26	1																
10	1.2D + 1.0W(150)	Yes	Y		DL	1.2	11	1	27	1																
11	1.2D + 1.0W(180)	Yes	Y		DL	1.2	4	-1	20	-1																
12	1.2D + 1.0W(210)	Yes	Y		DL	1.2	5	-1	21	-1																
13	1.2D + 1.0W(225)	Yes	Y		DL	1.2	6	-1	22	-1																
14	1.2D + 1.0W(240)	Yes	Y		DL	1.2	7	-1	23	-1																
15	1.2D + 1.0W(270)	Yes	Y		DL	1.2	8	-1	24	-1																
16	1.2D + 1.0W(300)	Yes	Y		DL	1.2	9	-1	25	-1																
17	1.2D + 1.0W(315)	Yes	Y		DL	1.2	10	-1	26	-1																
18	1.2D + 1.0W(330)	Yes	Y		DL	1.2	11	-1	27	-1																
19	1.2D + 1.0Di + 1.0Wi(0)	Yes	Y		DL	1.2	RL	1	12	1	28	1														
20	1.2D + 1.0Di + 1.0Wi(30)	Yes	Y		DL	1.2	RL	1	13	1	29	1														
21	1.2D + 1.0Di + 1.0Wi(45)	Yes	Y		DL	1.2	RL	1	14	1	30	1														
22	1.2D + 1.0Di + 1.0Wi(60)	Yes	Y		DL	1.2	RL	1	15	1	31	1														
23	1.2D + 1.0Di + 1.0Wi(90)	Yes	Y		DL	1.2	RL	1	16	1	32	1														
24	1.2D + 1.0Di + 1.0Wi(120)	Yes	Y		DL	1.2	RL	1	17	1	33	1														
25	1.2D + 1.0Di + 1.0Wi(135)	Yes	Y		DL	1.2	RL	1	18	1	34	1														
26	1.2D + 1.0Di + 1.0Wi(150)	Yes	Y		DL	1.2	RL	1	19	1	35	1														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
27	1.2D + 1.0Di + 1.0Wi(180)	Yes	Y		DL	1.2	RL	1	12	-1	28	-1												
28	1.2D + 1.0Di + 1.0Wi(210)	Yes	Y		DL	1.2	RL	1	13	-1	39	-1												
29	1.2D + 1.0Di + 1.0Wi(225)	Yes	Y		DL	1.2	RL	1	14	-1	30	-1												
30	1.2D + 1.0Di + 1.0Wi(240)	Yes	Y		DL	1.2	RL	1	15	-1	31	-1												
31	1.2D + 1.0Di + 1.0Wi(270)	Yes	Y		DL	1.2	RL	1	16	-1	32	-1												
32	1.2D + 1.0Di + 1.0Wi(300)	Yes	Y		DL	1.2	RL	1	17	-1	33	-1												
33	1.2D + 1.0Di + 1.0Wi(315)	Yes	Y		DL	1.2	RL	1	18	-1	34	-1												
34	1.2D + 1.0Di + 1.0Wi(330)	Yes	Y		DL	1.2	RL	1	19	-1	35	-1												
35	1.2D + 1.0E(0)	Yes	Y		DL	1.2	E...	-1	E...															
36	1.2D + 1.0E(30)	Yes	Y		DL	1.2	E...	-.8...	E...	.5														
37	1.2D + 1.0E(45)	Yes	Y		DL	1.2	E...	-.7...	E...	.707														
38	1.2D + 1.0E(60)	Yes	Y		DL	1.2	E...	-.5	E...	.866														
39	1.2D + 1.0E(90)	Yes	Y		DL	1.2	E...	-2....	E...	1														
40	1.2D + 1.0E(120)	Yes	Y		DL	1.2	E...	.5	E...	.866														
41	1.2D + 1.0E(135)	Yes	Y		DL	1.2	E...	.707	E...	.707														
42	1.2D + 1.0E(150)	Yes	Y		DL	1.2	E...	.866	E...	.5														
43	1.2D + 1.0E(180)	Yes	Y		DL	1.2	E...	1	E...	4.5...														
44	1.2D + 1.0E(210)	Yes	Y		DL	1.2	E...	.866	E...	-.5														
45	1.2D + 1.0E(225)	Yes	Y		DL	1.2	E...	.707	E...	-.7...														
46	1.2D + 1.0E(240)	Yes	Y		DL	1.2	E...	.5	E...	-.8...														
47	1.2D + 1.0E(270)	Yes	Y		DL	1.2	E...	6.8...	E...	-1														
48	1.2D + 1.0E(300)	Yes	Y		DL	1.2	E...	-.5	E...	-.8...														
49	1.2D + 1.0E(315)	Yes	Y		DL	1.2	E...	-.7...	E...	-.7...														
50	1.2D + 1.0E(330)	Yes	Y		DL	1.2	E...	-.8...	E...	-.5														
51	0.9D + 1.0E(0)	Yes	Y		DL	1.2	E...	-1	E...															
52	0.9D + 1.0E(30)	Yes	Y		DL	1.2	E...	-.8...	E...	.5														
53	0.9D + 1.0E(45)	Yes	Y		DL	1.2	E...	-.7...	E...	.707														
54	0.9D + 1.0E(60)	Yes	Y		DL	1.2	E...	-.5	E...	.866														
55	0.9D + 1.0E(90)	Yes	Y		DL	1.2	E...	-2....	E...	1														
56	0.9D + 1.0E(120)	Yes	Y		DL	1.2	E...	.5	E...	.866														
57	0.9D + 1.0E(135)	Yes	Y		DL	1.2	E...	.707	E...	.707														
58	0.9D + 1.0E(150)	Yes	Y		DL	1.2	E...	.866	E...	.5														
59	0.9D + 1.0E(180)	Yes	Y		DL	1.2	E...	1	E...	4.5...														
60	0.9D + 1.0E(210)	Yes	Y		DL	1.2	E...	.866	E...	-.5														
61	0.9D + 1.0E(225)	Yes	Y		DL	1.2	E...	.707	E...	-.7...														
62	0.9D + 1.0E(240)	Yes	Y		DL	1.2	E...	.5	E...	-.8...														
63	0.9D + 1.0E(270)	Yes	Y		DL	1.2	E...	6.8...	E...	-1														
64	0.9D + 1.0E(300)	Yes	Y		DL	1.2	E...	-.5	E...	-.8...														
65	0.9D + 1.0E(315)	Yes	Y		DL	1.2	E...	-.7...	E...	-.7...														
66	0.9D + 1.0E(330)	Yes	Y		DL	1.2	E...	-.8...	E...	-.5														
67	1.2D + 1.5Lm(1) + 1.0Wm(0)	Yes	Y		DL	1.2	4	.063	20	.063	O...	1.5												
68	1.2D + 1.5Lm(1) + 1.0Wm(30)	Yes	Y		DL	1.2	5	.063	21	.063	O...	1.5												
69	1.2D + 1.5Lm(1) + 1.0Wm(45)	Yes	Y		DL	1.2	6	.063	22	.063	O...	1.5												
70	1.2D + 1.5Lm(1) + 1.0Wm(60)	Yes	Y		DL	1.2	7	.063	23	.063	O...	1.5												
71	1.2D + 1.5Lm(1) + 1.0Wm(90)	Yes	Y		DL	1.2	8	.063	24	.063	O...	1.5												
72	1.2D + 1.5Lm(1) + 1.0Wm(120)	Yes	Y		DL	1.2	9	.063	25	.063	O...	1.5												
73	1.2D + 1.5Lm(1) + 1.0Wm(135)	Yes	Y		DL	1.2	10	.063	26	.063	O...	1.5												
74	1.2D + 1.5Lm(1) + 1.0Wm(150)	Yes	Y		DL	1.2	11	.063	27	.063	O...	1.5												
75	1.2D + 1.5Lm(1) + 1.0Wm(180)	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5												
76	1.2D + 1.5Lm(1) + 1.0Wm(210)	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5												
77	1.2D + 1.5Lm(1) + 1.0Wm(225)	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5												
78	1.2D + 1.5Lm(1) + 1.0Wm(240)	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5												
79	1.2D + 1.5Lm(1) + 1.0Wm(270)	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5												
80	1.2D + 1.5Lm(1) + 1.0Wm(300)	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5												
81	1.2D + 1.5Lm(1) + 1.0Wm(315)	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5												
82	1.2D + 1.5Lm(1) + 1.0Wm(330)	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5												
83	1.2D + 1.5Lm(2) + 1.0Wm(0)	Yes	Y		DL	1.2	4	.063	20	.063	O...	1.5												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
84	1.2D + 1.5Lm(2) + 1.0Wm(30)	Yes	Y		DL	1.2	5	.063	21	.063	O...	1.5														
85	1.2D + 1.5Lm(2) + 1.0Wm(45)	Yes	Y		DL	1.2	6	.063	22	.063	O...	1.5														
86	1.2D + 1.5Lm(2) + 1.0Wm(60)	Yes	Y		DL	1.2	7	.063	23	.063	O...	1.5														
87	1.2D + 1.5Lm(2) + 1.0Wm(90)	Yes	Y		DL	1.2	8	.063	24	.063	O...	1.5														
88	1.2D + 1.5Lm(2) + 1.0Wm(120)	Yes	Y		DL	1.2	9	.063	25	.063	O...	1.5														
89	1.2D + 1.5Lm(2) + 1.0Wm(135)	Yes	Y		DL	1.2	10	.063	26	.063	O...	1.5														
90	1.2D + 1.5Lm(2) + 1.0Wm(150)	Yes	Y		DL	1.2	11	.063	27	.063	O...	1.5														
91	1.2D + 1.5Lm(2) + 1.0Wm(180)	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5														
92	1.2D + 1.5Lm(2) + 1.0Wm(210)	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5														
93	1.2D + 1.5Lm(2) + 1.0Wm(225)	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5														
94	1.2D + 1.5Lm(2) + 1.0Wm(240)	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5														
95	1.2D + 1.5Lm(2) + 1.0Wm(270)	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5														
96	1.2D + 1.5Lm(2) + 1.0Wm(300)	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5														
97	1.2D + 1.5Lm(2) + 1.0Wm(315)	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5														
98	1.2D + 1.5Lm(2) + 1.0Wm(330)	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N2	max	1163.701	3	701.733	13	1391.726	23	1053.808	70	-275.561	6	1477.282	17
2		min	-1096.003	11	-702.898	5	400.164	1	-1898.195	94	-1574.554	30	-1480.543	9
3	N31	max	848.417	4	1103.409	15	1391.723	28	1996.343	24	225.031	18	1464.928	12
4		min	-880.979	12	-1044.381	7	399.933	1	200.736	16	-441.653	10	-1465.635	4
5	N59	max	948.26	18	957.615	15	1391.72	29	-43.152	17	1883.262	19	1464.878	7
6		min	-983.078	10	-1015.382	7	399.671	1	-819.915	30	71.994	11	-1465.578	15
7	Totals:	max	2668.562	3	2668.505	15	4174.933	23						
8		min	-2668.556	11	-2668.497	7	1199.768	1						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[in]	LC	Shear C...	Loc[in]	...	...	phi*Pnc [l...	phi*Pnt [...	phi*Mn y-y [l...	phi*Mn z-z [lb-ft]	Cb	Eqn
1	M5	PIPE_2.0	.569	41.576	3	.088	41.576		17	17855.085	32130	1871.625	1871.625	4.329	H1-1b
2	M19	PIPE_2.0	.569	41.576	14	.085	41.576		12	17855.085	32130	1871.625	1871.625	1.49	H1-1b
3	M33	PIPE_2.0	.569	41.576	8	.085	41.576		7	17855.085	32130	1871.625	1871.625	1.501	H1-1b
4	M3	PIPE_3.0	.348	29.697	91	.119	29.697		19	57037.472	65205	5748.75	5748.75	1.661	H1-1b
5	M31	PIPE_3.0	.312	29.697	20	.119	29.697		24	57037.472	65205	5748.75	5748.75	1.652	H1-1b
6	M17	PIPE_3.0	.312	29.697	26	.119	29.697		30	57037.472	65205	5748.75	5748.75	1.652	H1-1b
7	M38	PIPE_2.0	.259	42.424	10	.067	42.424		7	17855.085	32130	1871.625	1871.625	2.407	H1-1b
8	M10	PIPE_2.0	.259	42.424	4	.067	42.424		18	17855.085	32130	1871.625	1871.625	1.772	H1-1b
9	M24	PIPE_2.0	.259	42.424	15	.069	42.424		13	17855.085	32130	1871.625	1871.625	2.386	H1-1b
10	M1	HSS4X4...	.164	0	18	.221	0	y	94	106665.8...	106812	12661.5	12661.5	1.236	H1-1b
11	M15	HSS4X4...	.164	0	12	.167	0	y	25	106665.8...	106812	12661.5	12661.5	1.236	H1-1b
12	M29	HSS4X4...	.164	0	7	.166	0	y	19	106665.8...	106812	12661.5	12661.5	1.236	H1-1b
13	M45	PIPE_2.0	.130	3.455	5	.095	8.636		10	24514.617	32130	1871.625	1871.625	2.117	H1-1b
14	M55	PIPE_2.0	.122	3.455	11	.095	8.636		15	24514.617	32130	1871.625	1871.625	2.014	H1-1b
15	M50	PIPE_2.0	.122	3.455	16	.100	8.636		5	24514.617	32130	1871.625	1871.625	2.014	H1-1b
16	M58	PIPE_1.5	.005	9.318	28	.145	18.449		11	22565.846	23593.5	1105.125	1105.125	1.14	H1-1b
17	M59	PIPE_1.5	.005	9.318	33	.145	18.449		16	22565.846	23593.5	1105.125	1105.125	1.14	H1-1b
18	M60	PIPE_1.5	.005	9.318	23	.145	0		6	22565.846	23593.5	1105.125	1105.125	1.14	H1-1b

APPENDIX D

ADDITIONAL CALCUATIONS

CCI Mount Analysis Square Plate Connection 1.0.1

Location:	A	*Select*

SITE DATA	
BU Number:	876392
Site Name:	NEW HARTFORD / EXECUTIVE GREET
Order Number:	479857

BOLT DATA		
Quantity:	4	
Diameter:	0.625	in
Material:	A449 (1/4 to 1 Incl.)	*Select*
Fy:	92	ksi
Fu:	120	ksi
Bolt Spacing:	8.485	in

PLATE DATA		
Width:	8	in
Thickness:	0.625	in
Fy:	36	ksi

SUPPORT ARM DATA		
Type:	HSST	*Select*
Diameter/Width:	4	in
Thickness	0.25	in
Fy:	36	ksi
Number of Sides:	4	

TIA Revision:	TIA-222-H	*Select*

Normalizing to 100% per TIA-222-H Section 15.5

REACTIONS		
Moment:	1.517	kip-ft
Axial:	0.016	kips
Shear:	1.392	kips

Load Combination	30

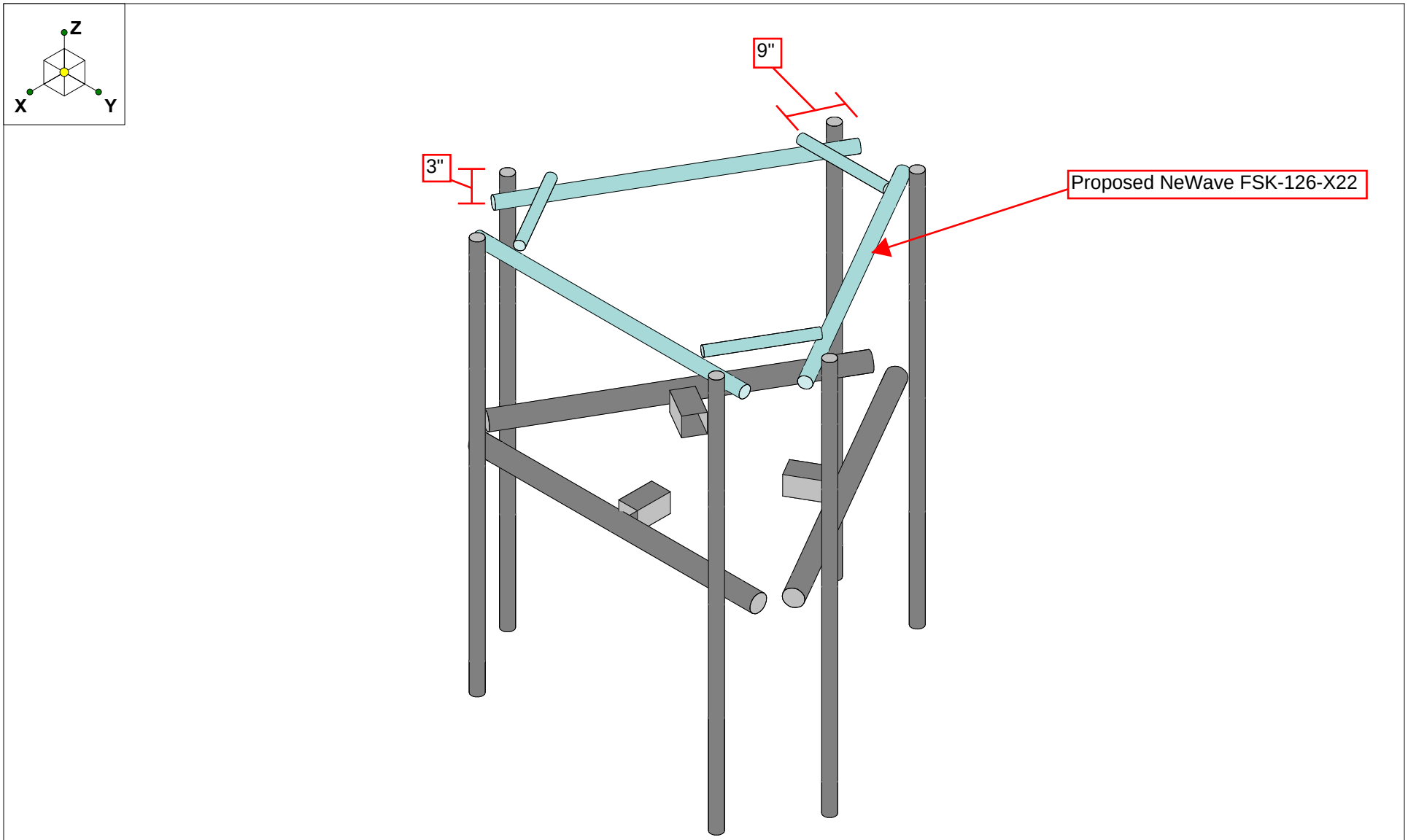
BOLT RESULTS		
Max Bolt (Cu+ Vu/η):	1.52	kips
Axial Design Strength:	21.70	kips
Stress Ratio	6.68%	

PLATE RESULTS		
Base Plate Stress:	8.52	ksi
Bending Strength:	32.40	ksi
Stress Ratio:	25.04%	

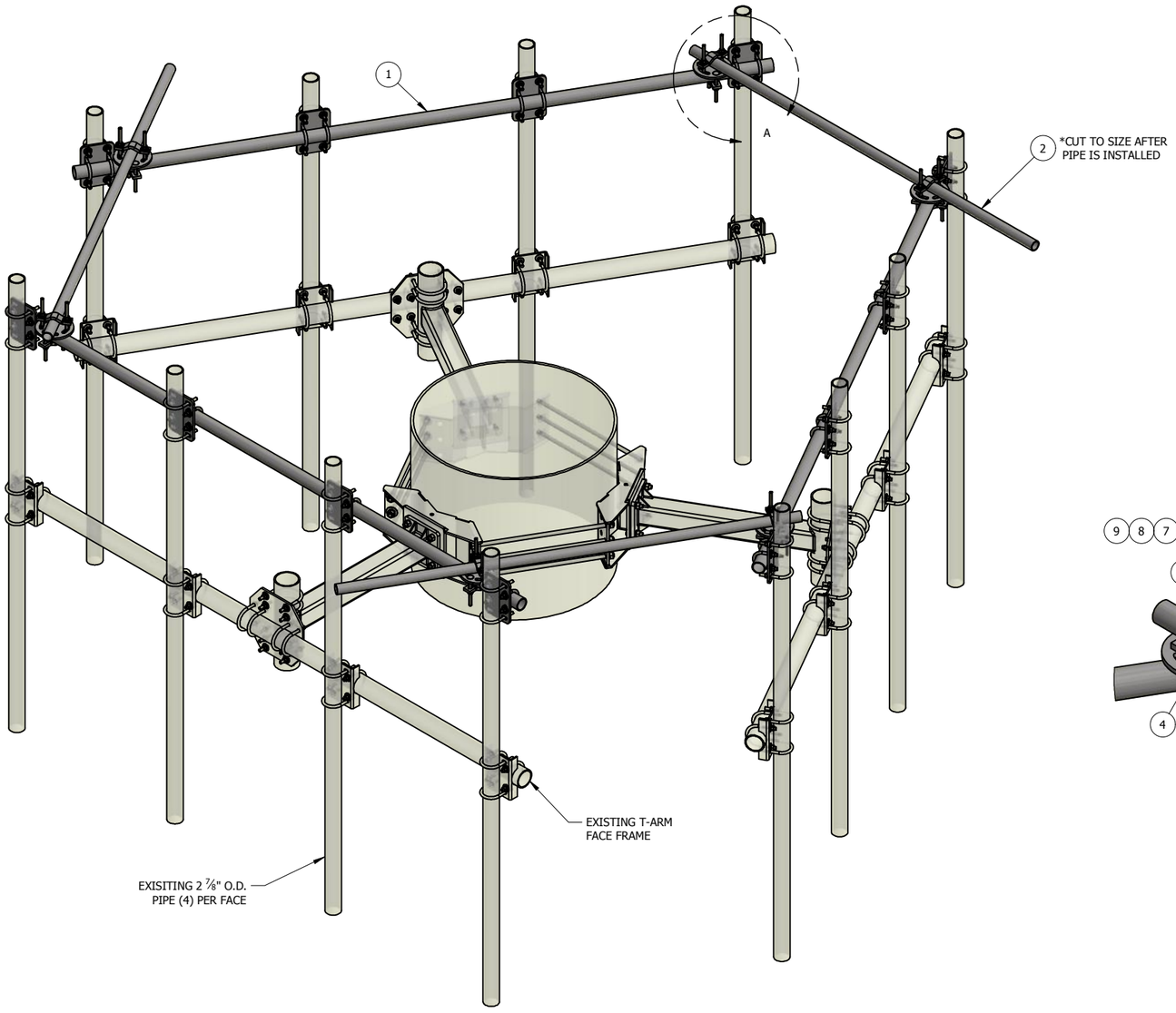
Controlling Load Combination	30

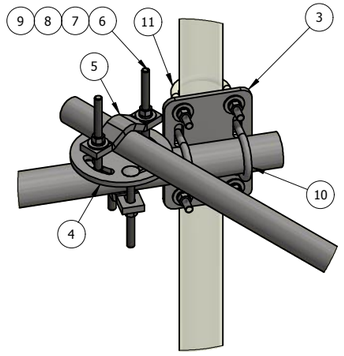
APPENDIX E

SUPPLEMENTAL DRAWINGS

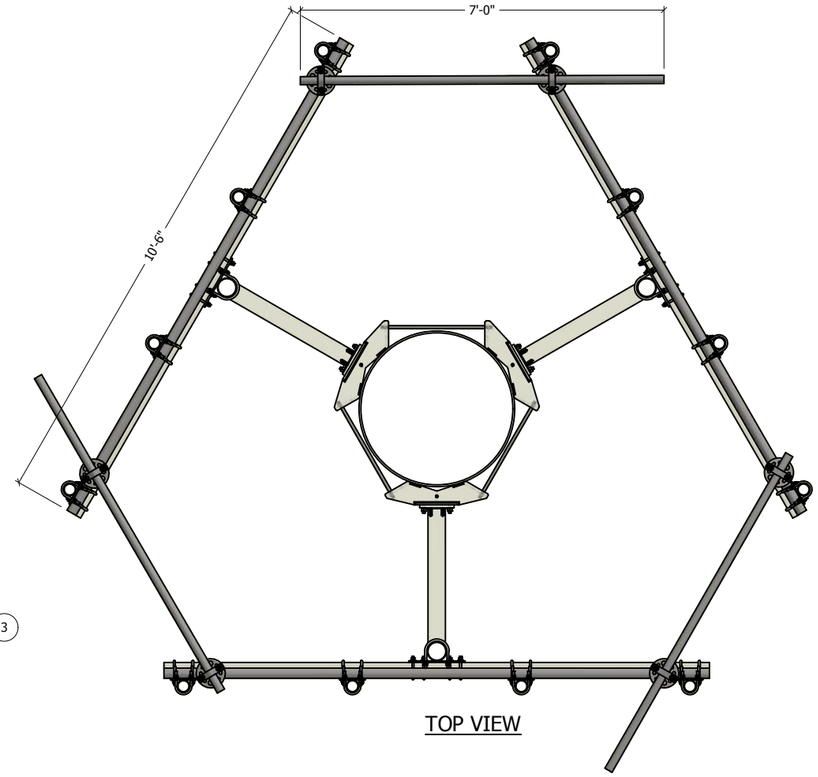


Kimley-Horn and Associates, Inc.		SK - 1
JSS	876392	Dec 2, 2020 at 10:40 AM
019558051	Conditional Pass Details - FSK-126-X22	ModModel.r3d





DETAIL - A



TOP VIEW

ITEM	PART #	QTY	DESCRIPTION	LENGTH	FINISH	UNIT WT
1	P23-126	3	GALV. 2" STD PIPE @ 10'-6" LONG		HDG	38.40
2	P178-84	3	GALV. 1-1/2" STD PIPE, CUT @ 7' LONG			19.04
3	CXP1	12	3/8" PLATE		HDG	0.00
4	CX13R.01	6	3/8" ROUND X-OVER PLT, 1-1/2" TO 3-1/2" O.D PIPE		HDG	3.09
5	AMCS-3.01	12	HALF CLAMP FOR 1-1/2" TO 3-1/2" O.D ROUND			1.23
6	27-5321-005	24	GALV. 1/2" X 6" GR.5 CARRAGE BOLT			0.37
7	27-5200-005	21	1/2" A36 HDG FLAT WASHER			0.04
8	27-5210-005	21	1/2" HDG LOCK WASHER			0.01
9	27-5222-005	21	1/2" HDG HEX NUT			0.04
10	27-6060-005	24	GALV. 1/2" x 2-1/2" x 4" GR-5 U-BOLT ASSEMBLY			0.76
11	27-6080-005	24	GALV. 1/2" x 3" x 5" GR-5 U-BOLT ASSEMBLY			0.20

STANDARD TOLERANCES:
(UNLESS OTHERWISE NOTED)
FRACTIONS ±1/16"
DECIMALS ±0.01"
ANGLES ±0.5°

NEWAVE
TOWER COMPONENTS. 503-792-3739
10910 PORTLAND RD. BROOKS, OR 97305

TOTAL WT: 239.55 LB
QTY:
FINISH: HDG
JOB #:

TITLE: FACE FRAME STIFFENER KIT, 2-3/8" O.D PIPE FACE 1-7/8" O.D STIFFARM PIPE @ 10'-6" LONG

SERIES: MONOPOLE MOUNTING
SHEET: 1 OF 1

DRAWN BY:	DATE:	CHK'D BY:
SJ	2/20/2019	CJW

DRAWING NO.
FSK-126-X22

Transcom Engineering, Inc.
Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CTNH414A

Litchfield 10 - Crown
115 Industrial Park
New Hartford, CT 06057

May 28, 2019

Transcom Engineering Project Number: 737001-0045

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**11.32 %**

May 28, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CTNH414A – Litchfield 10 - Crown**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **115 Industrial Park, New Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE 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.

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 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **115 Industrial Park, New Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
UMTS	2100 MHz (AWS)	1	40
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APX16DWV-16DWV-S-E-ACU	134
A	2	RFS APXVAARR24_43-U-NA20	134
B	1	RFS APX16DWV-16DWV-S-E-ACU	134
B	2	RFS APXVAARR24_43-U-NA20	134
C	1	RFS APX16DWV-16DWV-S-E-ACU	134
C	2	RFS APXVAARR24_43-U-NA20	134

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS) & 2100 MHz (AWS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.95 dB** of cable loss calculated into the system gains / losses for this site. For each ground mounted **2100 MHz (AWS)** radio there was **2.06 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **160 feet** of **1-1/4”** coax.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	6	215	5,313.89	1.16
Antenna A2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.28
						Sector A Composite MPE%	**2.44**
Antenna B1	RFS APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	6	215	5,313.89	1.16
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.28
						Sector B Composite MPE%	**2.44**
Antenna C1	RFS APX16DWV-16DWV-S-E-ACU	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	6	215	5,313.89	1.16
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.28
						Sector C Composite MPE%	**2.44**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**2.44 %**
Sprint	2.33 %
MetroPCS	0.61 %
Verizon Wireless	1.65 %
AT&T	4.29 %
Site Total MPE %:	**11.32 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	2.44 %
T-MOBILE Sector B Total:	2.44 %
T-MOBILE Sector C Total:	2.44 %
Site Total:	11.32 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	993.25	134	8.72	1900 MHz (PCS)	1000	0.87%
T-Mobile 1900 MHz (PCS) GSM	1	372.47	134	0.82	1900 MHz (PCS)	1000	0.08%
T-Mobile 2100 MHz (AWS) UMTS	1	968.41	134	2.12	2100 MHz (AWS)	1000	0.21%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	134	3.46	600 MHz	400	0.87%
T-Mobile 700 MHz LTE	2	432.54	134	1.90	700 MHz	467	0.41%
						Total:	**2.44%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

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 T-MOBILE 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:

T-MOBILE Sector	Power Density Value (%)
Sector A:	2.44 %
Sector B:	2.44 %
Sector C:	2.44 %
T-MOBILE Maximum Total (per sector):	2.44 %
Site Total:	11.32 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.32 %** 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.

Scott Heffernan
RF Engineering Director
Transcom Engineering, Inc
PO Box 1048
Sterling, MA 01564

T-Mobile

T-MOBILE SITE NUMBER: CTNH414A
T-MOBILE SITE NAME: LITCHFIELD 10
SITE TYPE: MONOPOLE
TOWER HEIGHT: 168'-0"

BUSINESS UNIT #: 876392
SITE ADDRESS: 115 INDUSTRIAL PARK RD, NEW HARTFORD, CT 06057
COUNTY: LITCHFIELD
JURISDICTION: TOWN OF NEW HARTFORD

T-MOBILE L600 SITE CONFIGURATION: 67D04G

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	NEW HARTFORD / EXECUTIVE GREET
SITE ADDRESS:	115 INDUSTRIAL PARK RD NEW HARTFORD, CT 06057
COUNTY:	LITCHFIELD
MAP/PARCEL #:	NHAR-000038-000134-000015C
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.886244°
LONGITUDE:	-72.966139°
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	558 FT.
CURRENT ZONING:	NOT REQUIRED
JURISDICTION:	TOWN OF NEW HARTFORD
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	GLOBAL SIGNAL ACQUISITIONS IV LLC PO BOX 277455 ATLANTA, GA 30389-7455
TOWER OWNER:	GLOBAL SIGNAL ACQUISITIONS II LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
CROWN CASTLE USA INC. APPLICATION ID:	479857
ELECTRIC PROVIDER:	NORTHEAST UTILITIES (800) 286-2000
TELCO PROVIDER:	AT&T (866) 620-6900

PROJECT TEAM

A&E FIRM:	B+T GROUP 1717 S BOULDER AVE, SUITE 300 TULSA, OK 74119 JENNY PAUL (918) 587-4630
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065 CATHERINE COVINGTON - PROJECT MANAGER (518) 373-3499 JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN AND ENLARGED SITE PLAN
C-2	FINAL ELEVATION AND ANTENNA PLANS
C-3	ANTENNA AND CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECIFICATIONS
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
ATTACHED	MOUNT SPECIFICATIONS
ATTACHED	MOUNT MOD SPECIFICATIONS

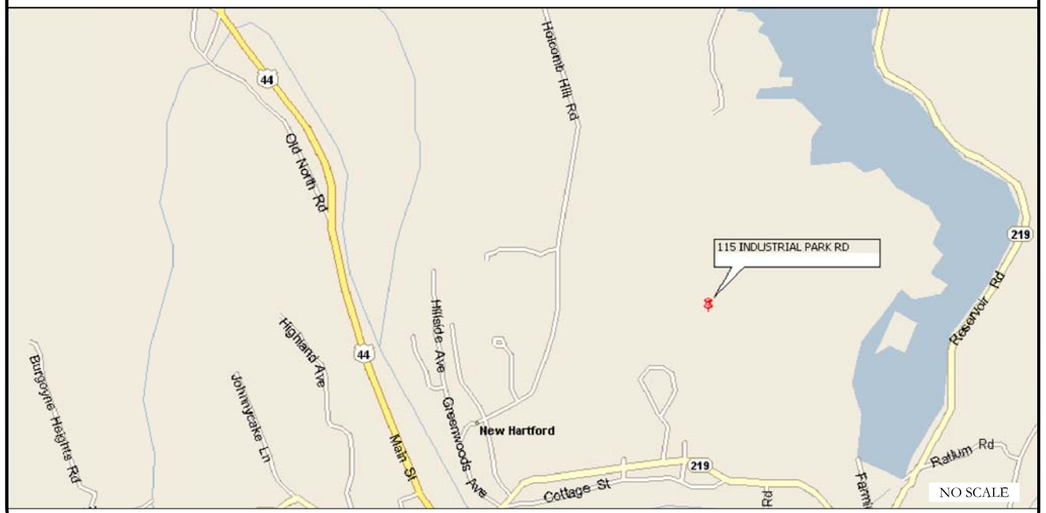
ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11x17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

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

LOCATION MAP



APPLICABLE CODES/REFERENCE DOCUMENTS

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: CROWN CASTLE 12/10/2020

MOUNT ANALYSIS: KIMLEY-HORN AND ASSOCIATES, INC. 12/2/2020

INSTALLER NOTE:

NO PROPOSED LOADING TO BE ADDED UNTIL MOUNT SWAP IS COMPLETE. CONTRACTOR TO INSTALL MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- RELOCATE (3) ANTENNAS
- RELOCATE (6) TMAs
- REMOVE (3) SECTOR MOUNT
- INSTALL (3) ANTENNAS
- INSTALL (3) RRHs
- INSTALL (1) 1-5/8" HYBRID CABLE
- INSTALL (3) SITE PRO 1 RDS-284 T-ARM MOUNT

GROUND SCOPE OF WORK:
- INSTALL (1) BB 6630

DESIGN PACKAGE BASED ON THE APPLICATION ID: 479857 REVISION: 4

DESIGN PACKAGE BASED ON THE RFDS REVISION: 3 DATE: 9/10/20

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CALL CONNECTICUT ONE CALL (800) 922-4455 CBYD.COM CALL 2 WORKING DAYS BEFORE YOU DIG!

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/25/21	JTS	PRELIMINARY	MTJ
0	3/3/21	MTJ	CONSTRUCTION	MTJ
1	3/24/21	JJD	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: T-1
REVISION: 1

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALLS.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.

5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR-	
SUBCONTRACTOR-	GENERAL CONTRACTOR (CONSTRUCTION)
CARRIER-	T-MOBILE
TOWER OWNER-	CROWN CASTLE USA INC.
OEM-	ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR AND CROWN CASTLE USA INC.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

SYMBOLS:

-GS/GB-	SOLID GROUND BUS BAR
-GS/NB-	SOLID NEUTRAL BUS BAR
	SUPPLEMENTAL GROUND CONDUCTOR
	2-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	SINGLE-POLE THERMAL-MAGNETIC CIRCUIT BREAKER
	CHEMICAL GROUND ROD
	TEST WELL
	DISCONNECT SWITCH
M	METER
	EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
	MECHANICAL CONNECTION
	GROUNDING WIRE

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE USA INC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET AND DRY) OPERATION WITH OUTER JACKET LISTED OR LABELED FOR THE LOCATION USED UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E. RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL; SHALL MEET OR EXCEED UL 50 AND RATED NEMA 1 (OR BETTER) INDOORS OR NEMA 3R (OR BETTER) OUTDOORS.
24. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
25. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T-MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS, WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

NEC INSULATOR COLOR CODE

DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED-POLARITY MARK AT TERMINATION
VDC NEG	-	*BLACK-POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE OR PURPLE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

T-Mobile

12920 SE 38TH STREET
BELLEVUE, WA 98006

CROWN CASTLE

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

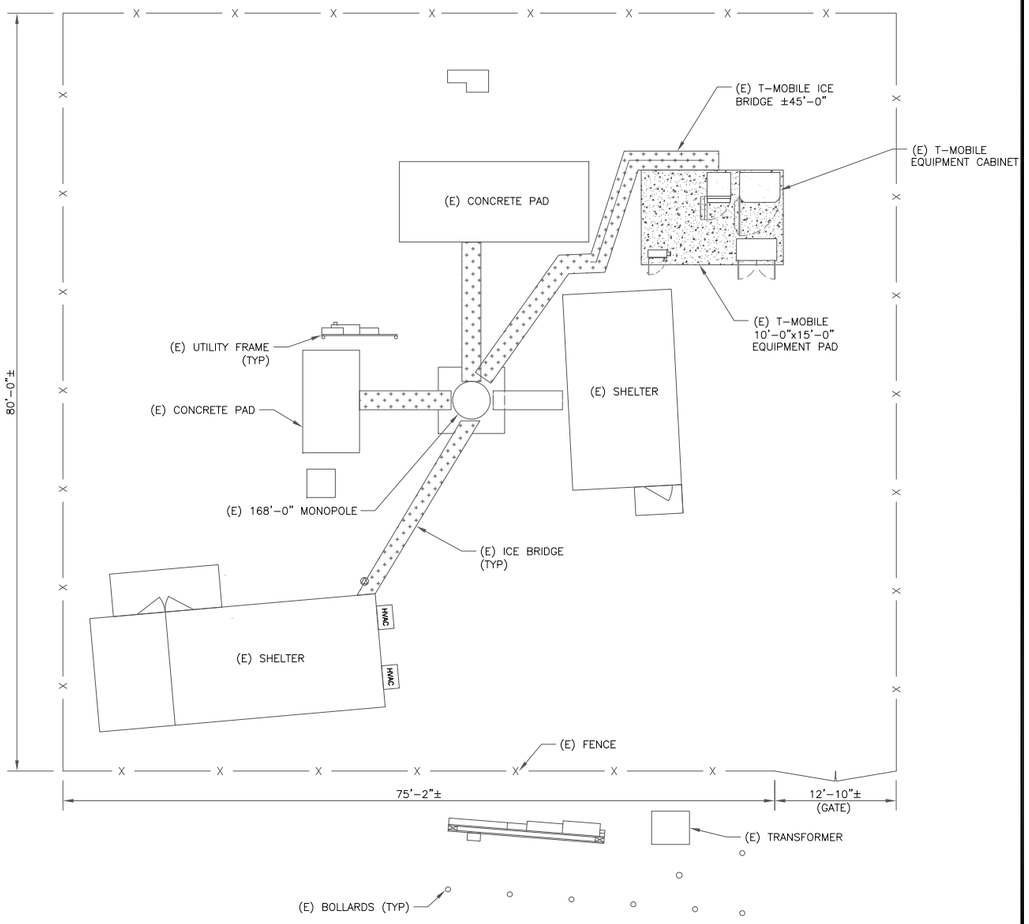
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/25/21	JTS	PRELIMINARY	MTJ
0	3/3/21	MTJ	CONSTRUCTION	MTJ
1	3/24/21	JJD	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

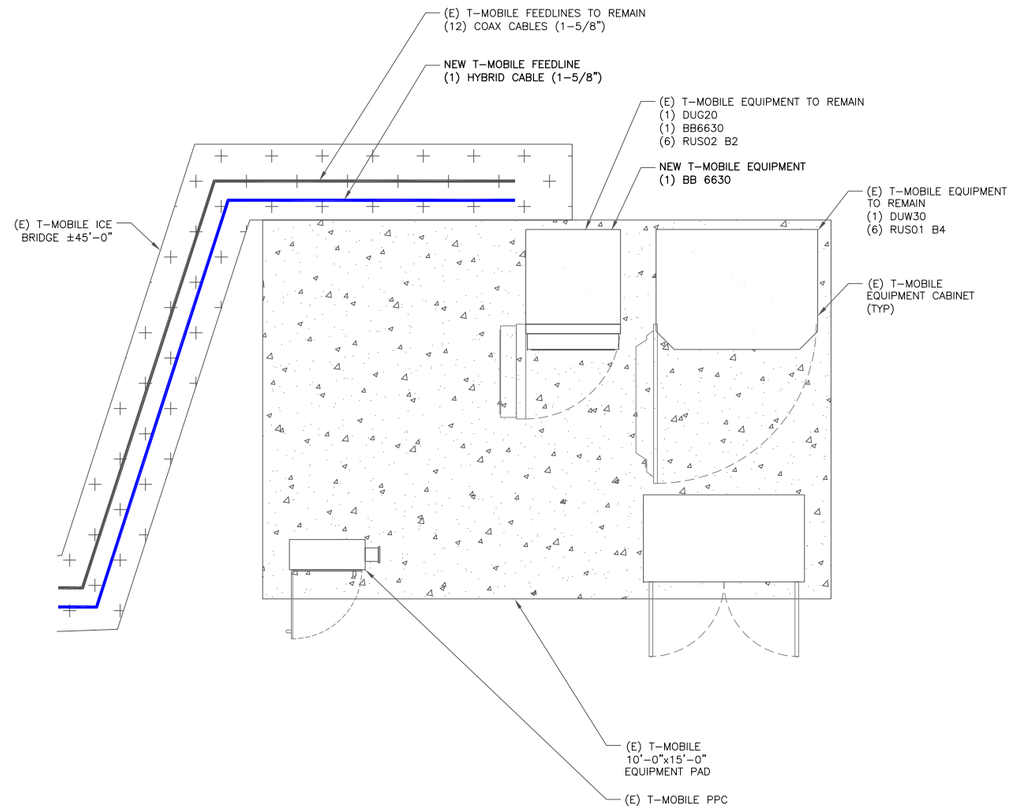
SHEET NUMBER: T-2

REVISION: 1



1 SITE PLAN
SCALE: 8' 6' 4' 2' 0 8' 1/8"=1'-0" (FULL SIZE) 1/16"=1'-0" (11x17)

N



2 ENLARGED SITE PLAN
SCALE: 2' 1' 0 2' 1/2"=1'-0" (FULL SIZE) 1/4"=1'-0" (11x17)

N

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

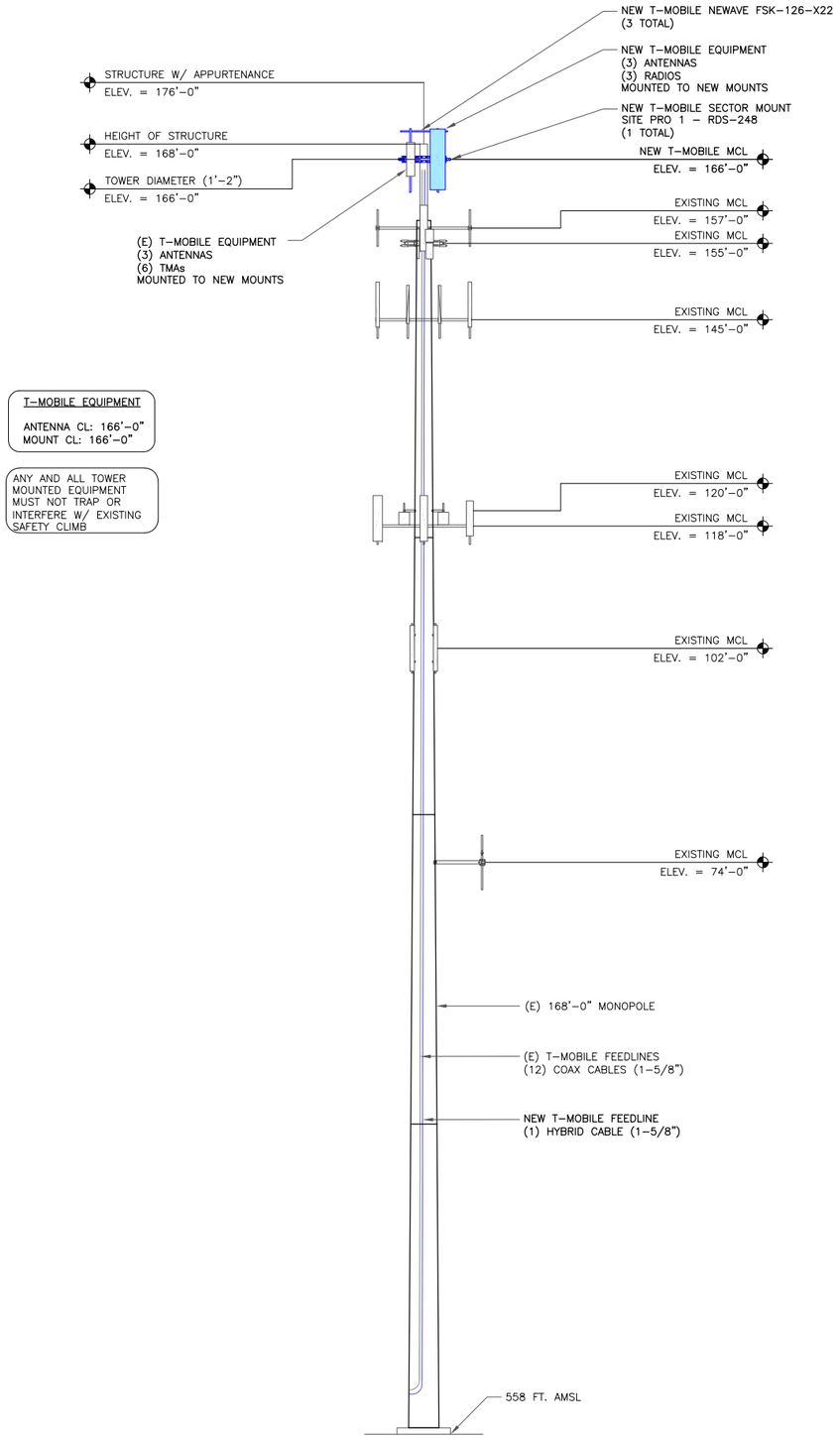
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/25/21	JTS	PRELIMINARY	MTJ
0	3/3/21	MTJ	CONSTRUCTION	MTJ
1	3/24/21	JJD	CONSTRUCTION	GEH

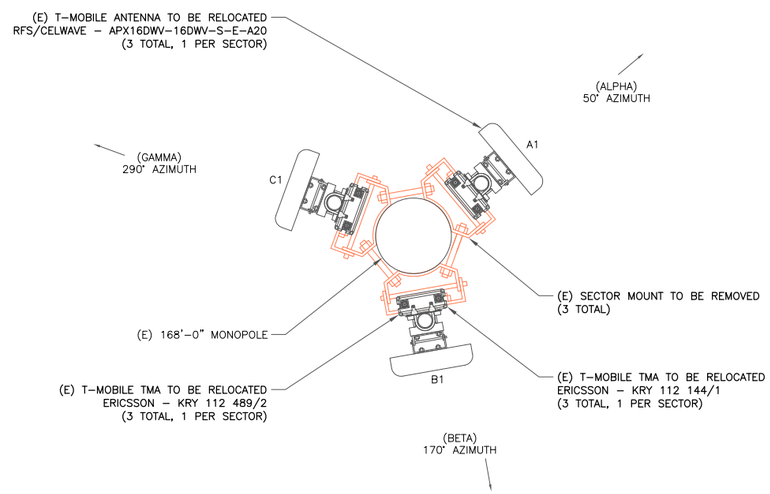
STATE OF CONNECTICUT
No. 23024
LICENSED
PROFESSIONAL ENGINEER
3/24/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-1
REVISION: 1

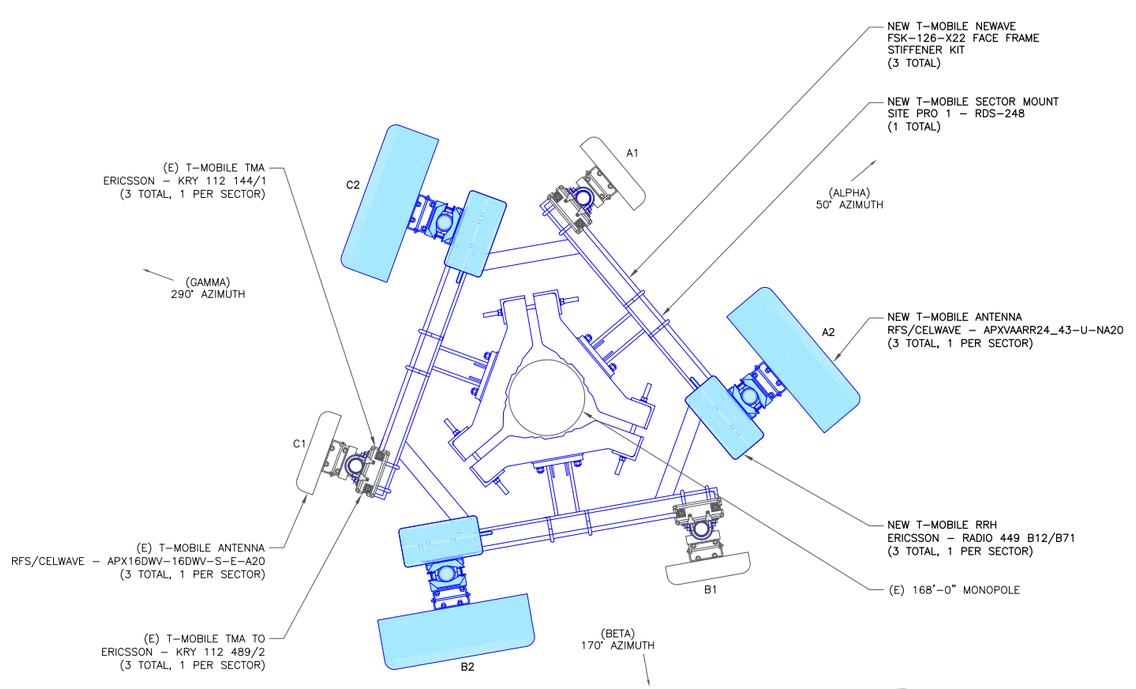


1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

N



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

N

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	2/25/21	JTS	PRELIMINARY	MTJ
0	3/3/21	MTJ	CONSTRUCTION	MTJ
1	3/24/21	JJD	CONSTRUCTION	GEH

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-2

REVISION: 1

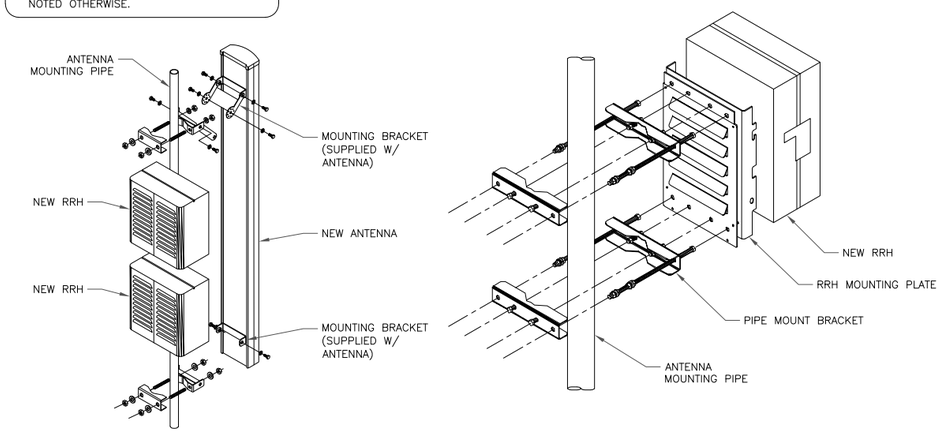
ANTENNA SCHEDULE									
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L1900/G1900/U2100	166'-0"	50°	RFS/CELWAVE	APX16DWV-16DWV-S-E-A20	0°	2°/2°	(1) ERICSSON - KRY 112 489/2 (1) ERICSSON - KRY 112 144/1	COAX
ALPHA	A2	L700/L600/N600	166'-0"	50°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°/2°	(1) ERICSSON - RADIO 4449 B12/B71	HYBRID
BETA	B1	L1900/G1900/U2100	166'-0"	170°	RFS/CELWAVE	APX16DWV-16DWV-S-E-A20	0°	2°/2°	(1) ERICSSON - KRY 112 489/2 (1) ERICSSON - KRY 112 144/1	COAX
BETA	B2	L700/L600/N600	166'-0"	170°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°/2°	(1) ERICSSON - RADIO 4449 B12/B71	HYBRID
GAMMA	C1	L1900/G1900/U2100	166'-0"	290°	RFS/CELWAVE	APX16DWV-16DWV-S-E-A20	0°	2°/2°	(1) ERICSSON - KRY 112 489/2 (1) ERICSSON - KRY 112 144/1	COAX
GAMMA	C2	L700/L600/N600	166'-0"	290°	RFS/CELWAVE	APXVAARR24_43-U-NA20	0°	2°/2°	(1) ERICSSON - RADIO 4449 B12/B71	HYBRID

CABLE SCHEDULE			
STATUS	CABLE TYPE	SIZE	QUANTITY
EXISTING	COAX	1-5/8"	12
NEW	HYBRID	1-5/8"	1
CABLE QUANTITY			13

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

INSTALLER NOTES:

1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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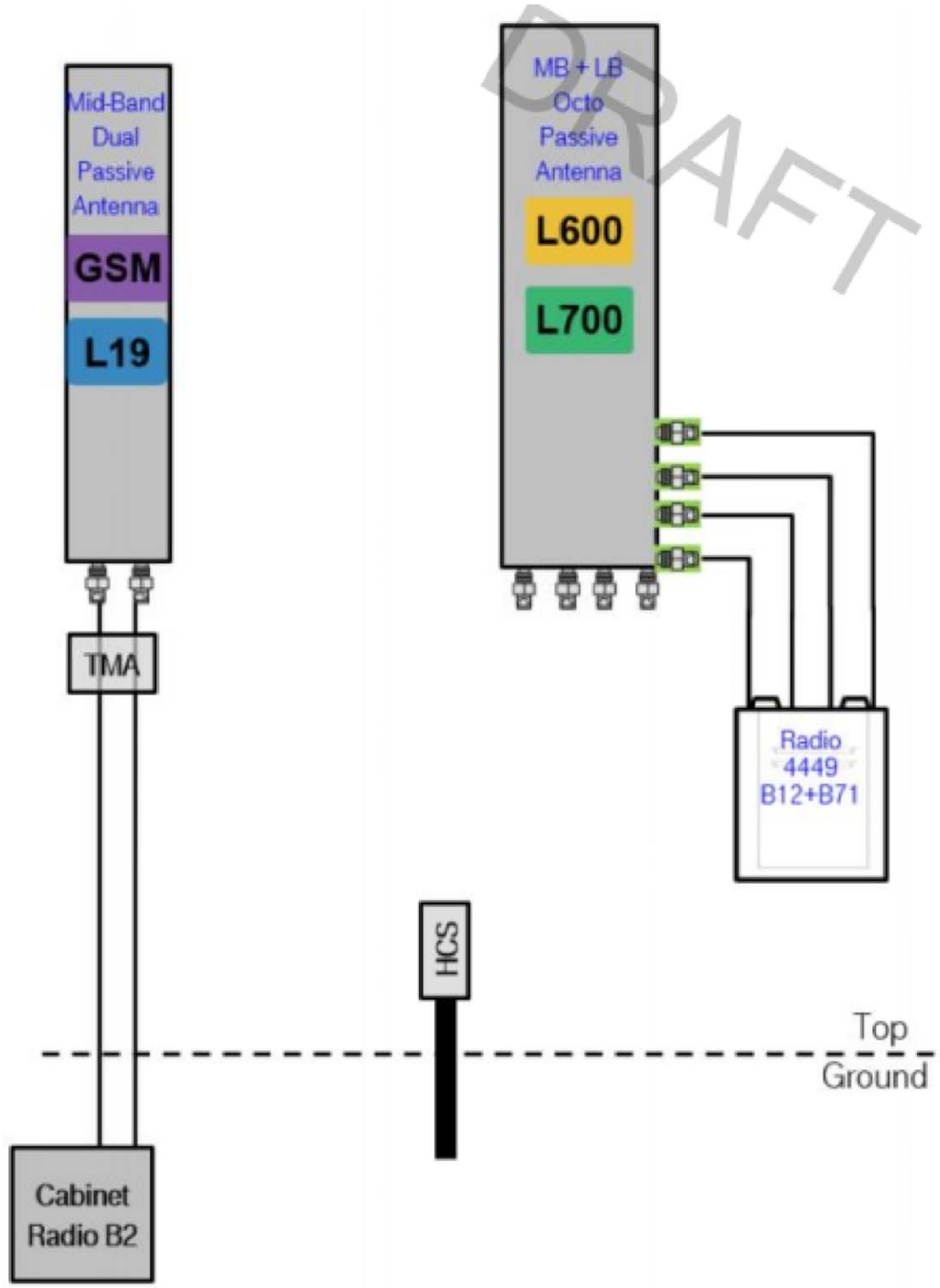
STATE OF CONNECTICUT
No. 23824
LICENSED
PROFESSIONAL ENGINEER
3/24/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-3

REVISION: 1



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile

12920 SE 38TH STREET
BELLEVUE, WA 98006

CROWN CASTLE

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD /
EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

ISSUED FOR:

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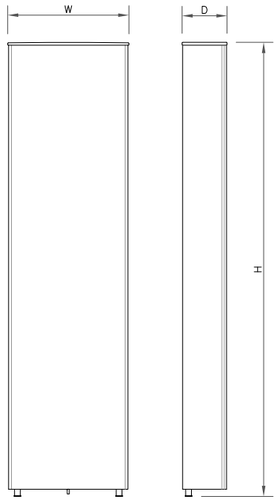
STATE OF CONNECTICUT
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/24/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

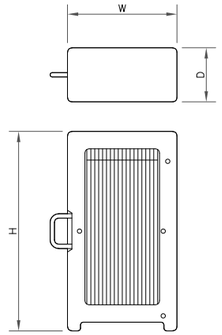
SHEET NUMBER: C-4

REVISION: 1



ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APXVAALL24_43-U-NA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90
WEIGHT	149.90

1 RFS/CELWAVE – APXVAARR24_43-U-NA20
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICCSON
MODEL #	4449
WIDTH	13.20"
DEPTH	10.63"
HEIGHT	17.91"
WEIGHT	73.21 LBS

2 ERICSSON – RADIO 4449
SCALE: NOT TO SCALE

3 NOT USED
SCALE: NOT TO SCALE

4 NOT USED
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

ISSUED FOR:

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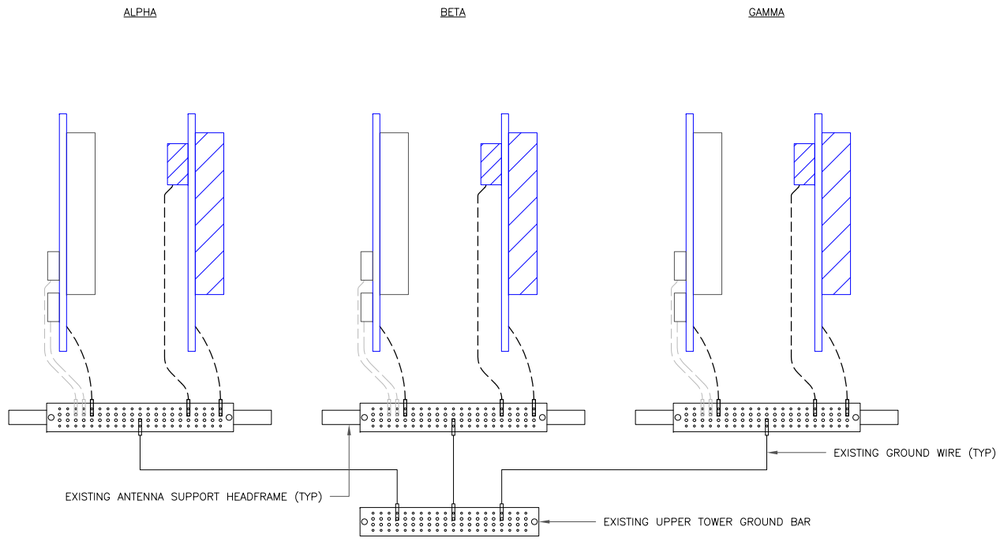
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: C-5
REVISION: 1



1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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

T-MOBILE SITE NUMBER:
CTNH414A

BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

EXISTING 168'-0" MONOPOLE

ISSUED FOR:

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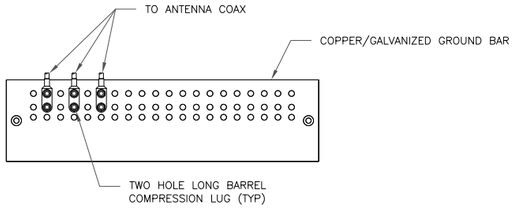
1	3/24/21	JJD	CONSTRUCTION	GEH

STATE OF CONNECTICUT
No. 23024
LICENSED
PROFESSIONAL ENGINEER
3/24/21

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: G-1

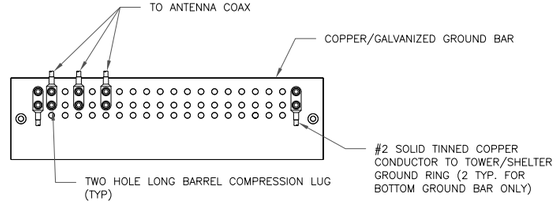
REVISION: 1



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

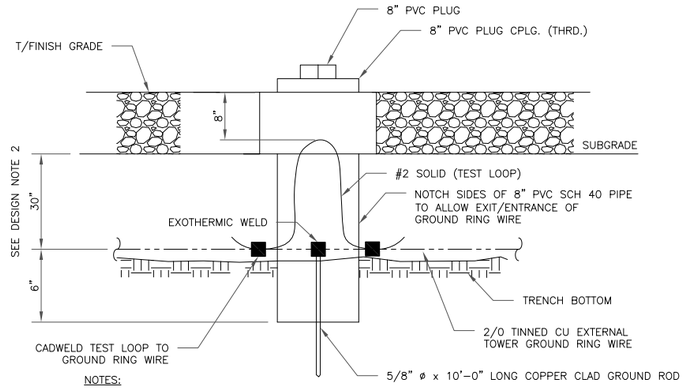
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

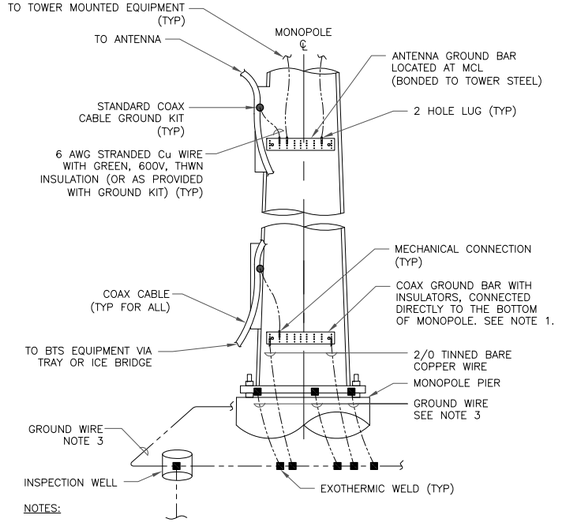
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

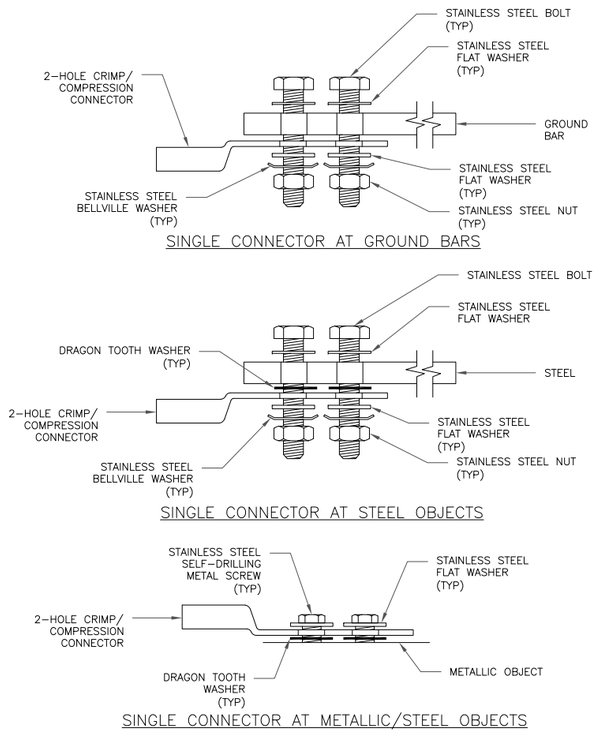
3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



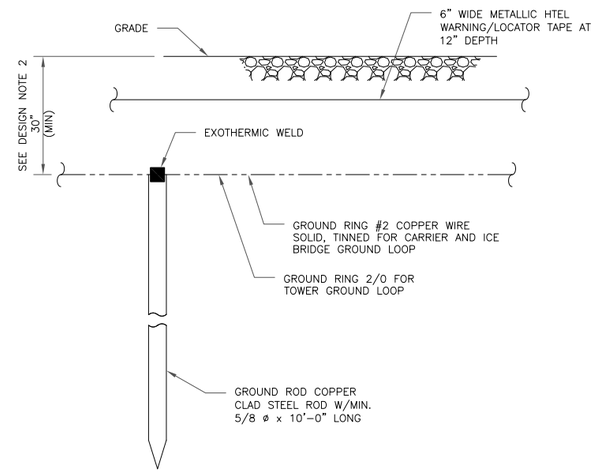
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
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CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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T-MOBILE SITE NUMBER:
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BU #: **876392**
NEW HARTFORD / EXECUTIVE GREET

115 INDUSTRIAL PARK RD
NEW HARTFORD, CT 06057

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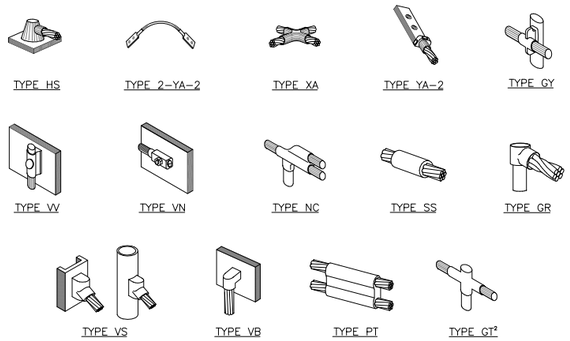
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

SHEET NUMBER: G-2

REVISION: 1

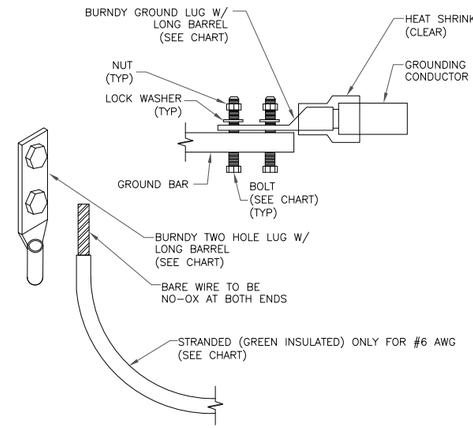


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

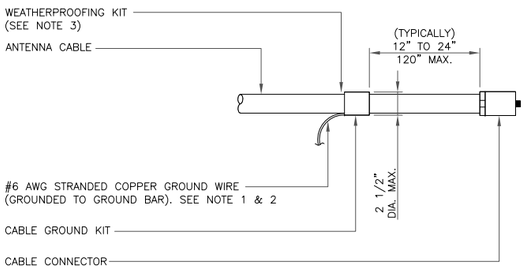
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

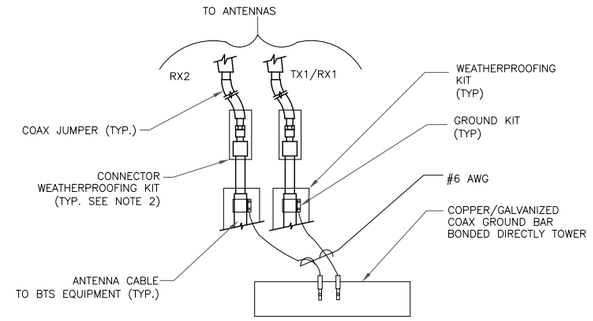
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

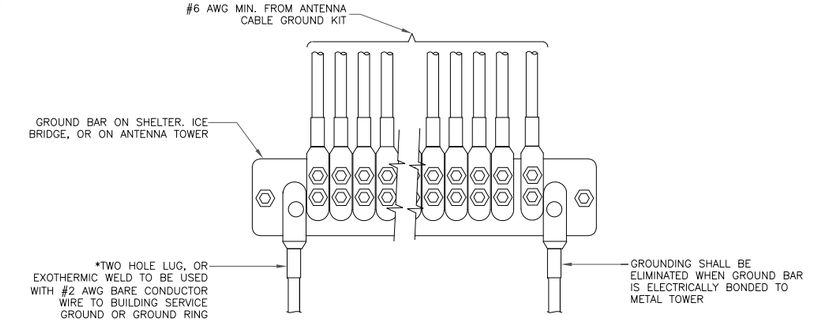
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



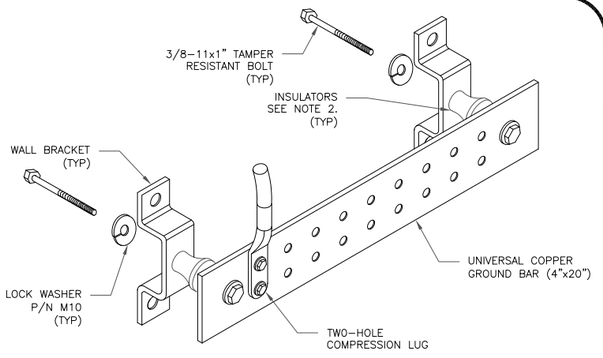
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



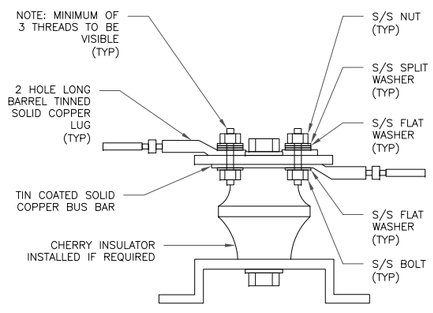
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



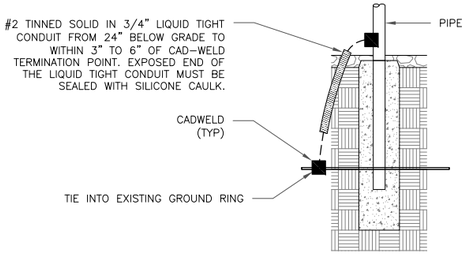
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
12920 SE 38TH STREET
BELLEVUE, WA 98006

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T-MOBILE SITE NUMBER:
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NEW HARTFORD / EXECUTIVE GREET

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EXISTING 168'-0" MONOPOLE

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0	3/3/21	MTJ	CONSTRUCTION	MTJ
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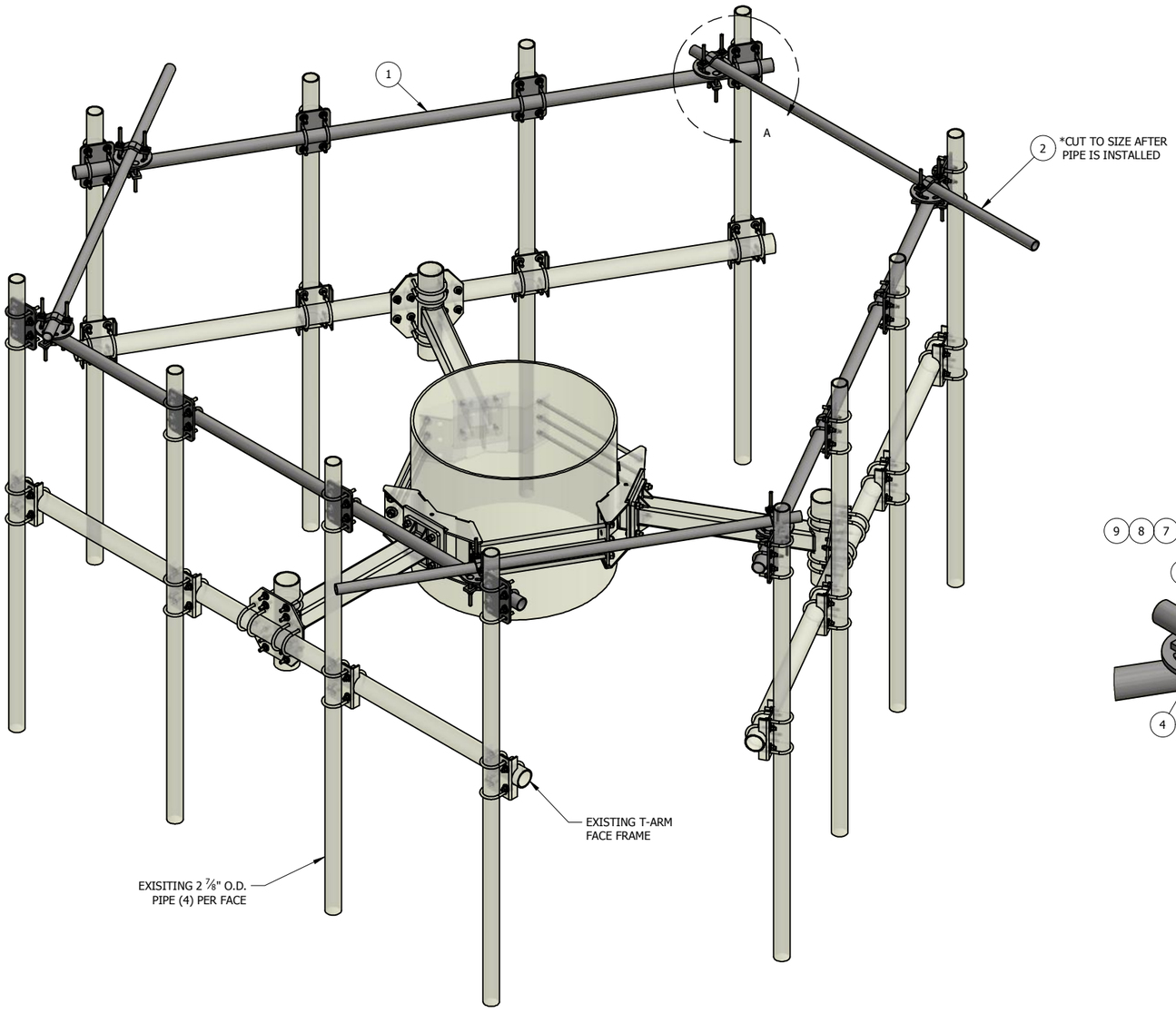
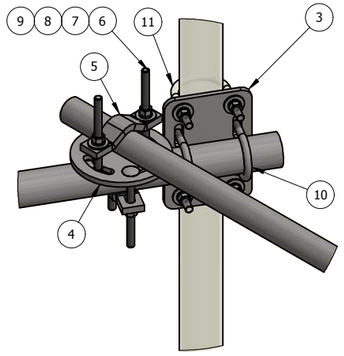
B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/21

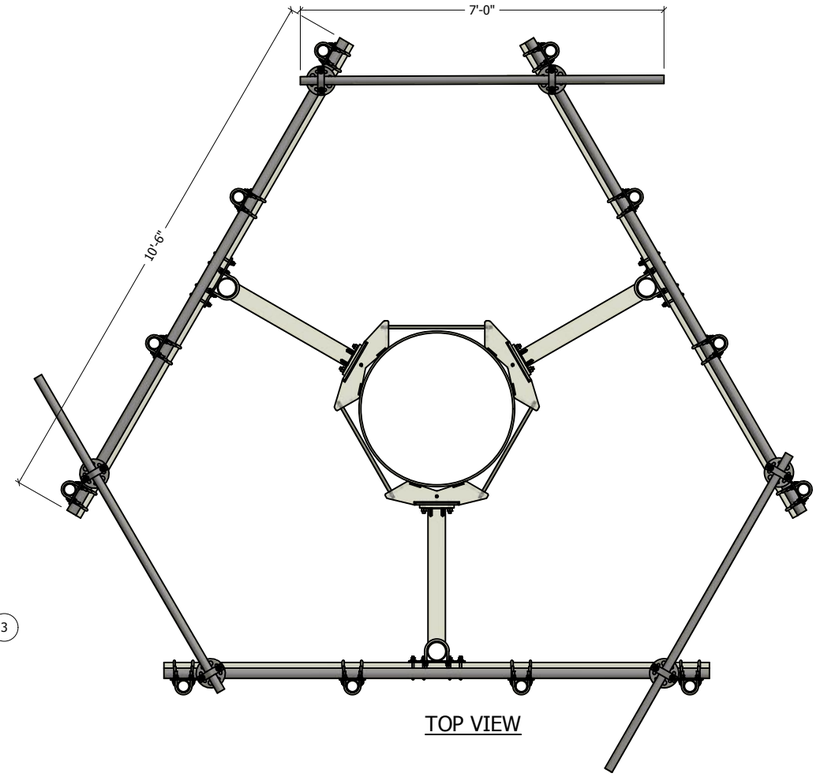
SHEET NUMBER: G-3

REVISION: 1





DETAIL - A



TOP VIEW

ITEM	PART #	QTY	DESCRIPTION	LENGTH	FINISH	UNIT WT
1	P23-126	3	GALV. 2" STD PIPE @ 10'-6" LONG		HDG	38.40
2	P178-84	3	GALV. 1-1/2" STD PIPE, CUT @ 7' LONG			19.04
3	CXP1	12	3/8" PLATE		HDG	0.00
4	CX13R.01	6	3/8" ROUND X-OVER PLT, 1-1/2" TO 3-1/2" O.D PIPE		HDG	3.09
5	AMCS-3.01	12	HALF CLAMP FOR 1-1/2" TO 3-1/2" O.D ROUND			1.23
6	27-5321-005	24	GALV. 1/2" X 6" GR.5 CARRAGE BOLT			0.37
7	27-5200-005	21	1/2" A36 HDG FLAT WASHER			0.04
8	27-5210-005	21	1/2" HDG LOCK WASHER			0.01
9	27-5222-005	21	1/2" HDG HEX NUT			0.04
10	27-6060-005	24	GALV. 1/2" x 2-1/2" x 4" GR-5 U-BOLT ASSEMBLY			0.76
11	27-6080-005	24	GALV. 1/2" x 3" x 5" GR-5 U-BOLT ASSEMBLY			0.20

STANDARD TOLERANCES:
(UNLESS OTHERWISE NOTED)
FRACTIONS ±1/16"
DECIMALS ±0.01"
ANGLES ±0.5°

NEWAVE
TOWER COMPONENTS. 503-792-3739
10910 PORTLAND RD. BROOKS, OR 97305

TOTAL WT: 239.55 LB
QTY:
FINISH: HDG
JOB #:

TITLE: FACE FRAME STIFFENER KIT, 2-3/8" O.D PIPE FACE 1-7/8" O.D STIFFARM PIPE @ 10'-6" LONG

SERIES: MONOPOLE MOUNTING
SHEET: 1 OF 1

DRAWN BY:	DATE:	CHK'D BY:
SJ	2/20/2019	CJW

DRAWING NO.
FSK-126-X22