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

December 15, 2021

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

RE: **Notice of Exempt Modification for T-Mobile: CTHA812A**
Crown Site ID#876363
219 New Park Ave, Hartford, CT 06488
Latitude: 41° 45′ 2.79″ / Longitude: -72° 42′ 49.23″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 98-foot mount level on the existing 108-foot monopole tower, located at 219 New Park Ave, Hartford, CT. The property is owned by Connecticut Light & Power Company. The tower is owned by Crown Castle. T-Mobile now intends to replace six (6) antennas, add three (3) new antennas and ancillary equipment at the 98-ft 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) CommScope – W-65A-R1 Antenna
(3) Ericsson – AIR6449 B41 Antenna
(3) RFS- APXVAALL24-43-U-NA20 Antenna
(3) Ericsson Radio 4460 B25+B66 Radio
(3) Ericsson- 4480 B71+B85 Radio
(3) HYBRID Hybrid Cable (1-5/8")
Modify Existing Antenna Mount Platform

Remove:
(3) NOKIA- AAHF Antenna
(3) RFS/Celwave- APXV9ERR18-C-A20 Antenna
(3) RFS/Celwave- IBC1900BB-1 Comnr
(3) RFS/Celwave- IBC1900HG-2A Comnr
(3) Hybrid Cables

Ground:

Install New:
(1) 6160 Equipment Cabinet
(1) B160 Battery Cabinet
(3.) BB 6648

(1.) DUG20
(1.) IXRe Router IN 6160

Remove:
All Existing Equipment

The facility was approved by the City of Hartford in 2000 per the original building permit. An email was sent to the City on 12/06/2018 in an effort to ascertain original zoning documents. No documents were ever sent. Attached with this letter are the email and original building permit.

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 Mr. Luke Bronin, Mayor, City of Hartford, CT, Mr. John Collins, Building Official & Chief of Building Trades, City of Hartford, CT and Connecticut Light & Power, Property Owner. Crown Castle is the tower owner.

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

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

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

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

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

For the foregoing reasons, 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:

Mr. Luke Bronin, Mayor
City of Hartford
550 Main Street, 2nd Fl Room 200
Hartford, CT 06103
(860) 757-9500

Mr. John Collins, Building Official & Chief of Building Trades
City of Hartford
550 Main Street
Hartford, CT 06103
(860) 757-9236

Connecticut Light & Power, Property Owner
107 Selden Street
C/O Corporate Property MGMT Dept
Northeast Utilities Service Company
Berlin, CT 06037
860-665-6987

Crown Castle, Tower Owner.

McKay, Kristian

From: McKay, Kristian
Sent: Thursday, December 6, 2018 4:52 PM
To: 'vanessa.walton@hartford.gov'
Subject: Original zoning docs

Hello Zoning Department,

I work for Crown Castle and have an inquiry regarding the original zoning documents for a tower and I am hoping your office can provide more information.

We are applying for CSC Zoning Approval for Sprint to modify their antennas and new requirements ask that we attempt to procure original zoning documents from the jurisdiction, if possible. However, if these documents are not available, please let me know.

The tower is located at 219 New Park Ave. and according to lease documents I believe would have been constructed sometime in the late 2000. Connecticut light and power company owned the property at the time and continues to do so.

If you have any questions, please don't hesitate to call or e-mail me.

Thank you,

Kristian McKay
Real Estate Specialist – East Area
T: (704) 405-6612 | M: (704) 713-5728 | F: (724) 416-6496

CROWN CASTLE
3530 Toringdon Way, Suite 300, Charlotte, NC 28277
Crowncastle.com

CT23XC550

BUILDING PERMIT

DEPARTMENT OF LICENSES & INSPECTIONS
CITY OF HARTFORD

Appl. Nbr.20004372 Permit Nbr. 20004898 HC

THE APPLICANT NAMED BELOW IS HEREBY GRANTED PERMISSION TO PERFORM WORK AS DESCRIBED HEREIN AT:

0000 0219 NEW PARK AV

FLOOR: CONDO:

IN ACCORDANCE WITH THE APPLICATION AND PLANS APPROVED BY THE DEPARTMENT OF LICENSES AND INSPECTIONS.

Joseph Hewes
Building Official

Date 11/15/00

OWNER: CONN. LIGHT AND POWER
ADDRESS: 410 SHELDON STREET
HARTFORD, CT 06103

APPLICANT: **ALEX TYURIN**
SPRINT SPECTRUM LP
541 SPRING STREET SUITE 1
WINDSOR, CT 06096

654-0702

ESTIMATED COST: $ 175000.00

Application Date: 10/24/00 Fee: 2828.00

DESCRIPTION OF JOB:
CONSTRUCTION OF TELECOMMUNICATION TOWER WITH ANTENNAS AND RELATED EQUIPMENT ON THE GROUND.

PARCEL ID.: 302004003

Unofficial Property Record Card - Hartford, CT

General Property Data

Parcel ID	138-472-001	Account Number	
Prior Parcel ID			
Property Owner	CONN LIGHT & POWER CO	Property Location	219 NEW PARK AVE
		Property Use	OTHER UTILTY
Mailing Address	PO BOX 270	Most Recent Sale Date	7/2/1982
		Legal Reference	01977 0129
City	HARTFORD	Grantor	
Mailing State	CT Zip 06141-0270	Sale Price	0
ParcelZoning	MS-3	Land Area	311,018.000 acres

Current Property Assessment

Card 1 Value	Building Value	Xtra Features Value	Land Value	Total Value
	11,830	10,570	1,094,870	1,117,270

Building Description

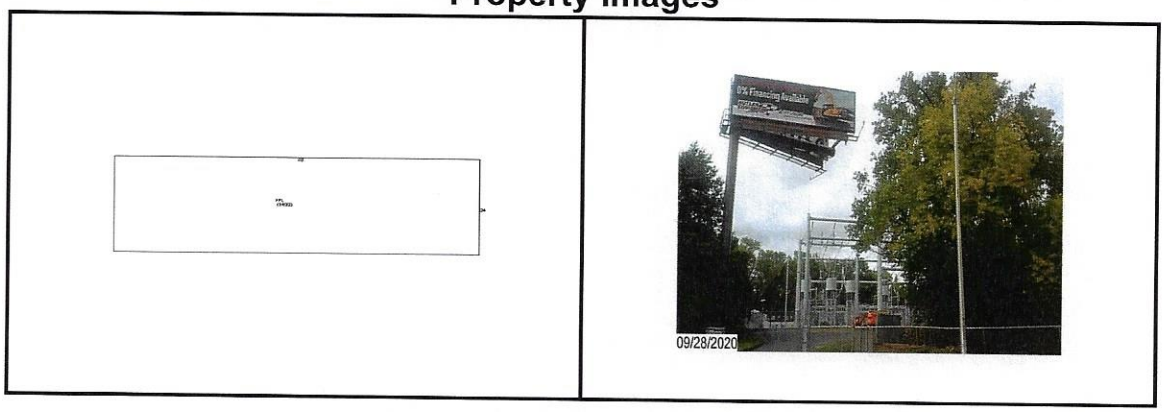
Building Style	WAREHSE	Foundation Type	Concrete	Flooring Type	COMBINATION
# of Living Units	0	Frame Type	Steel Light	Basement Floor	N/A
Year Built	1978	Roof Structure	GABLE/HIP	Heating Type	Electric
Building Grade	Economy	Roof Cover	Metal	Heating Fuel	Electric
Building Condition	N/A	Siding	Metal	Air Conditioning	0%
Finished Area (SF)	1632	Interior Walls	DRYWALL	# of Bsmt Garages	0
Number Rooms	0	# of Bedrooms	0	# of Full Baths	0
# of 3/4 Baths	0	# of 1/2 Baths	0	# of Other Fixtures	0

Legal Description

Narrative Description of Property

This property contains 311,018.000 acres of land mainly classified as OTHER UTILTY with a(n) WAREHSE style building, built about 1978 , having Metal exterior and Metal roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

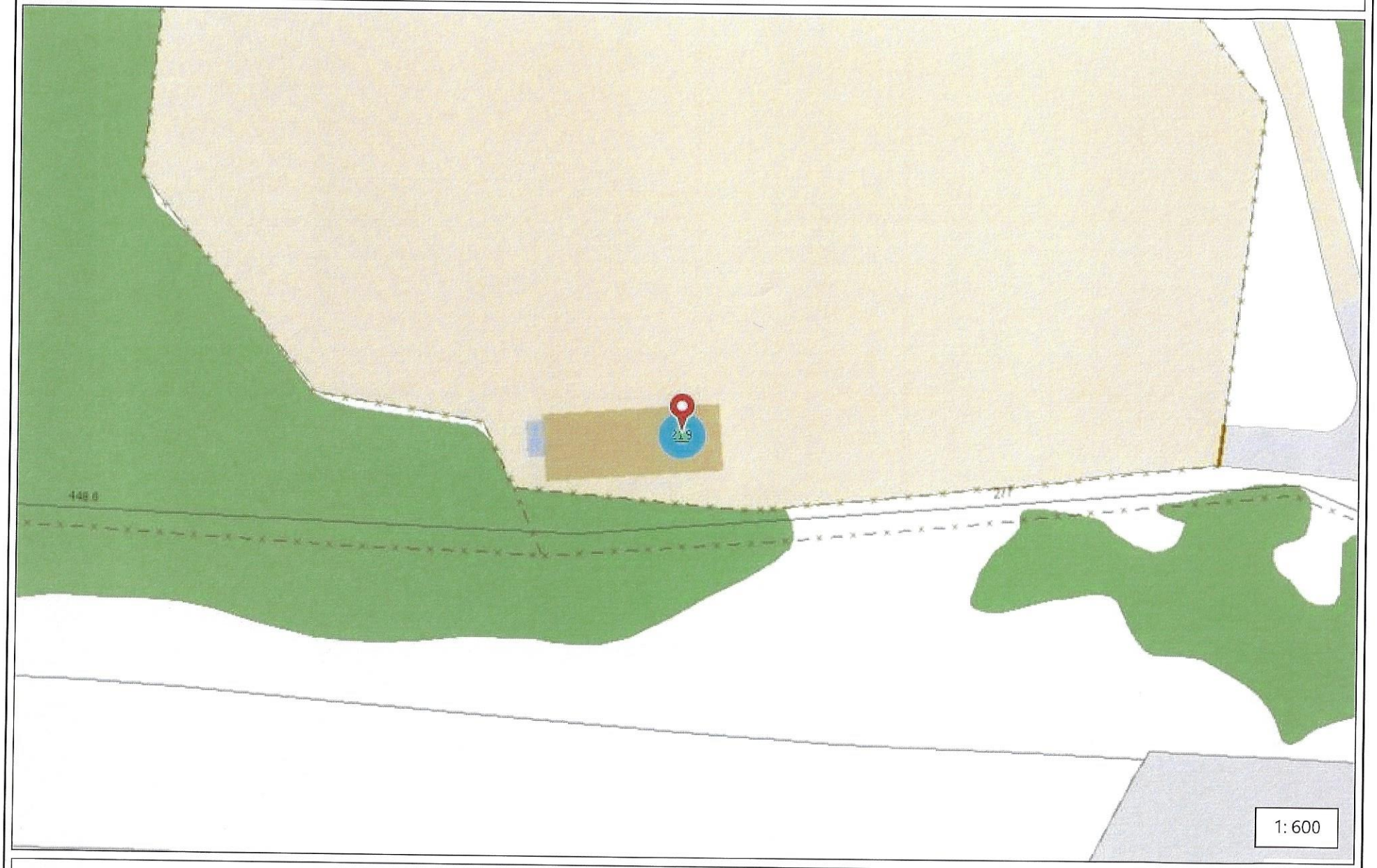
Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

City of Hartford - Property Map

219 New Park Ave



100 0 50 100 Feet

City of Hartford GIS Services - HartfordGIS

Date Printed: 12/15/2021

The planimetric and topographic information depicted on this map was compiled by The Sanbor Map Company and is based on an aerial flight performed in April 2015. In addition, the City's GIS staff has been updating limited planimetric features on a yearly basis. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose. The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data. THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY

N W E S

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, December 16, 2021 10:57 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 775505738771: Your package has been delivered

Hi. Your package was delivered Thu, 12/16/2021 at 10:55am.

Delivered to 550 MAIN ST, HARTFORD, CT 06103

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775505738771

FROM Jeff Barbadora
1800 W. Park Drive
WESTBOROUGH, MA, US, 01581

TO	City of Hartford Luke Bronin, Mayor 550 Main Street 2nd Fl, Room 200 HARTFORD, CT, US, 06103
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 12/15/2021 06:23 PM
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, December 16, 2021 10:56 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 775505761596: Your package has been delivered

Hi. Your package was delivered Thu, 12/16/2021 at 10:54am.

Delivered to 550 MAIN ST, HARTFORD, CT 06103

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775505761596

FROM Jeff Barbadora
1800 W. Park Drive
WESTBOROUGH, MA, US, 01581

TO	City of Hartford John Collins, Building Official 550 Main Street HARTFORD, CT, US, 06103
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 12/15/2021 06:23 PM
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	HARTFORD, CT, US, 06103
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Priority Overnight

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Thursday, December 16, 2021 12:14 PM
To: Barbadora, Jeff
Subject: FedEx Shipment 775505809837: Your package has been delivered

Hi. Your package was delivered Thu, 12/16/2021 at 12:07pm.

Delivered to 107 SELDEN ST, BERLIN, CT 06037
Received by K.HAJ

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER 775505809837

FROM	Jeff Barbadora 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Connecticut Light & Power C/O Corporate Property MGMT Dept 107 Selden Street BERLIN, CT, US, 06037
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Wed 12/15/2021 06:23 PM
DELIVERED TO	Shipping/Receiving
PACKAGING TYPE	FedEx Envelope
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	BERLIN, CT, US, 06037
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	0.50 LB
SERVICE TYPE	FedEx Priority Overnight

Date: **November 03, 2021**

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	**Site Number:**	CTHA812A
	Site Name:	CT23XC550
Crown Castle Designation:	**BU Number:**	876363
	Site Name:	HARTFORD - NU (SSUSA)
	JDE Job Number:	682275
	Work Order Number:	2021612
	Order Number:	582283 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	85565.013.01
Site Data:	**219 New Park Rd., HARTFORD, Hartford County, CT** **Latitude *41° 45' 2.79"*, Longitude *-72° 42' 49.23"*** **108 Foot - Monopole**	

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

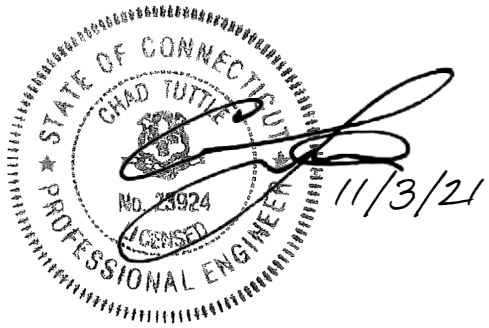
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity – 76.5%**

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2018 Connecticut State Building Code(2015 IBC). Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria

Structural analysis prepared by: Jacob Johnson, E.I.T.

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564; Expires: 02/10/2022



Chad E. Tuttle, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a 108 ft. Monopole designed by Summit.

The Monopole 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:	117 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 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)
98.0	99.0	3	Commscope	VV-65A-R1_TMO	3	1-5/8
		3	Ericsson	AIR6449 B41_T-MOBILE		
		3	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	Ericsson	RADIO 4480 B71_TMO		
		3	Rfs Celwave	APXVAALL24_43-U-NA20_TMO		
	98.0	1	--	Platform Mount [LP 1201-1_HR-1]		
	96.0	3	--	13.5' x 2 STD Horizontal Pipe		
	93.0	3	Site Pro 1	PRK-SFS-L		

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)
105.0	107.0	3	Antel	BXA-70063/6CF	1 7	1-5/8 1-1/4
		6	Commscope	SBNHH-1D65B		
	105.0	1	Commscope	BASMNT-SBS-1-2		
		1	Raycap	RVZDC-6627-PF-48		
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z		
		3	Samsung Tele.	MT6407-77A		
		3	Samsung Tele.	RFV01U-D1A		
		3	Samsung Tele.	RFV01U-D2A		
		1	--	Sector Mount [SM 401-3]		
96.0	96.0	3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER	--	--
		3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz		
		1	--	Side Arm Mount [SO 102-3]		
	95.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz		
81.0	81.0	1	--	T-Arm Mount [TA 602-3]	6 1	7/8 5/16
	80.0	3	Andrew	HBX-6516DS-VTM		
74.0	76.0	1	Lucent	KS24019-L112A	1	1/2
	74.0	1	--	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	1947570	CCI Sites
Tower Modification Drawing	2445633	CCI Sites
Post Modification Inspection	2445631	CCI Sites
Tower Modification Drawing	3348853	CCI Sites
Post Modification Inspection	4424435	CCI Sites
Tower Modification Drawing	6859034	CCI Sites
Post Modification Inspection	7243678	CCI Sites
Foundation Drawing	1613616	CCI Sites
Geotech Report	2337384	CCI Sites
Crown CAD Package	Date: 10/26/2021	CCI Sites

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. 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.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

1) The 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. B+T Group 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	108 - 103	Pole	TP8.625x8.625x0.3125	1	-2.454	-	21.1%	Pass
L2	103 - 98.5	Pole	TP8.625x8.625x0.3125	2	-2.672	-	52.4%	Pass
L3	98.5 - 98	Pole	TP16.5x16.5x0.3125	3	-2.711	-	15.0%	Pass
L4	98 - 93	Pole	TP17.3x16.5x0.1875	4	-8.702	-	30.7%	Pass
L5	93 - 88	Pole	TP18.101x17.3x0.1875	5	-8.977	-	44.9%	Pass
L6	88 - 83	Pole	TP18.901x18.101x0.1875	6	-9.344	-	57.5%	Pass
L7	83 - 82.87	Pole	TP18.921x18.901x0.1875	7	-9.362	-	57.8%	Pass
L8	82.87 - 82.62	Pole	TP18.961x18.921x0.3625	8	-9.387	-	47.0%	Pass
L9	82.62 - 77.62	Pole	TP19.762x18.961x0.3563	9	-10.940	-	57.4%	Pass
L10	77.62 - 76.25	Pole	TP19.981x19.762x0.3563	10	-11.084	-	60.2%	Pass
L11	76.25 - 76	Pole	TP20.021x19.981x0.6	11	-11.134	-	42.7%	Pass
L12	76 - 75.75	Pole + Reinf.	TP20.061x20.021x0.4563	12	-11.172	-	49.6%	Pass
L13	75.75 - 74.33	Pole + Reinf.	TP20.288x20.061x0.45	13	-11.384	-	52.0%	Pass
L14	74.33 - 74.08	Pole + Reinf.	TP20.328x20.288x0.5875	14	-11.432	-	45.6%	Pass
L15	74.08 - 69.08	Pole + Reinf.	TP21.128x20.328x0.575	15	-12.335	-	53.0%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L16	69.08 - 64.08	Pole + Reinf.	TP21.929x21.128x0.55	16	-13.184	-	60.0%	Pass
L17	64.08 - 59.08	Pole + Reinf.	TP22.729x21.929x0.5375	17	-14.052	-	66.8%	Pass
L18	59.08 - 58.08	Pole + Reinf.	TP22.889x22.729x0.5375	18	-14.229	-	68.1%	Pass
L19	58.08 - 57.73	Pole + Reinf.	TP22.945x22.889x0.6	19	-14.306	-	62.9%	Pass
L20	57.73 - 57.5	Pole + Reinf.	TP22.982x22.945x0.6	20	-14.355	-	58.7%	Pass
L21	57.5 - 52.5	Pole + Reinf.	TP23.783x22.982x0.575	21	-15.377	-	64.2%	Pass
L22	52.5 - 50.25	Pole + Reinf.	TP24.663x23.783x0.575	22	-15.847	-	66.6%	Pass
L23	50.25 - 45.25	Pole + Reinf.	TP24.568x23.768x0.625	23	-17.561	-	65.2%	Pass
L24	45.25 - 40.25	Pole + Reinf.	TP25.368x24.568x0.6125	24	-18.733	-	69.5%	Pass
L25	40.25 - 38.08	Pole + Reinf.	TP25.715x25.368x0.6125	25	-19.246	-	71.3%	Pass
L26	38.08 - 37.83	Pole + Reinf.	TP25.755x25.715x0.7125	26	-19.316	-	65.0%	Pass
L27	37.83 - 32.83	Pole + Reinf.	TP26.555x25.755x0.7	27	-20.549	-	68.9%	Pass
L28	32.83 - 27.73	Pole + Reinf.	TP27.372x26.555x0.725	28	-21.898	-	64.2%	Pass
L29	27.73 - 27.5	Pole + Reinf.	TP27.409x27.372x0.725	29	-21.968	-	64.4%	Pass
L30	27.5 - 22.5	Pole + Reinf.	TP28.209x27.409x0.7	30	-23.307	-	67.6%	Pass
L31	22.5 - 19.5	Pole + Reinf.	TP28.689x28.209x0.6875	31	-24.126	-	69.5%	Pass
L32	19.5 - 19.25	Pole + Reinf.	TP28.729x28.689x0.8	32	-24.206	-	64.8%	Pass
L33	19.25 - 14.25	Pole + Reinf.	TP29.529x28.729x0.775	33	-25.659	-	67.7%	Pass
L34	14.25 - 14	Pole + Reinf.	TP29.569x29.529x0.775	34	-25.739	-	67.8%	Pass
L35	14 - 13.75	Pole + Reinf.	TP29.609x29.569x0.775	35	-25.813	-	68.0%	Pass
L36	13.75 - 12.98	Pole + Reinf.	TP29.732x29.609x1.075	36	-26.107	-	54.6%	Pass
L37	12.98 - 12.82	Pole + Reinf.	TP29.759x29.732x0.95	37	-26.171	-	60.8%	Pass
L38	12.82 - 12.65	Pole + Reinf.	TP29.785x29.759x0.85	38	-26.228	-	63.9%	Pass
L39	12.65 - 12.5	Pole + Reinf.	TP29.809x29.785x0.85	39	-26.279	-	64.0%	Pass
L40	12.5 - 12.25	Pole + Reinf.	TP29.849x29.809x0.8	40	-26.359	-	65.0%	Pass
L41	12.25 - 7.25	Pole + Reinf.	TP30.65x29.849x0.7875	41	-27.968	-	67.6%	Pass
L42	7.25 - 2.25	Pole + Reinf.	TP31.45x30.65x0.775	42	-29.600	-	70.0%	Pass
L43	2.25 - 0	Pole + Reinf.	TP31.81x31.45x0.7625	43	-30.341	-	71.0%	Pass
							Summary	
						Pole (L7)	57.8	Pass
						Reinforcement	71.3	Pass
						Rating =	71.3	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component		Elevation	% Capacity	Pass / Fail
1	Flange Connection		98.0’	54.4	Pass
1	Anchor Rods		Base	62.5	Pass
1	Base Plate		Base	45.7	Pass
1,2	Anchor Rod Bracket		Base	58.5	Pass
1	Base Foundation	Structure	Base	76.5	Pass
		Soil	Base	45.2	Pass

Structure Rating (max from all components) =	76.5%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

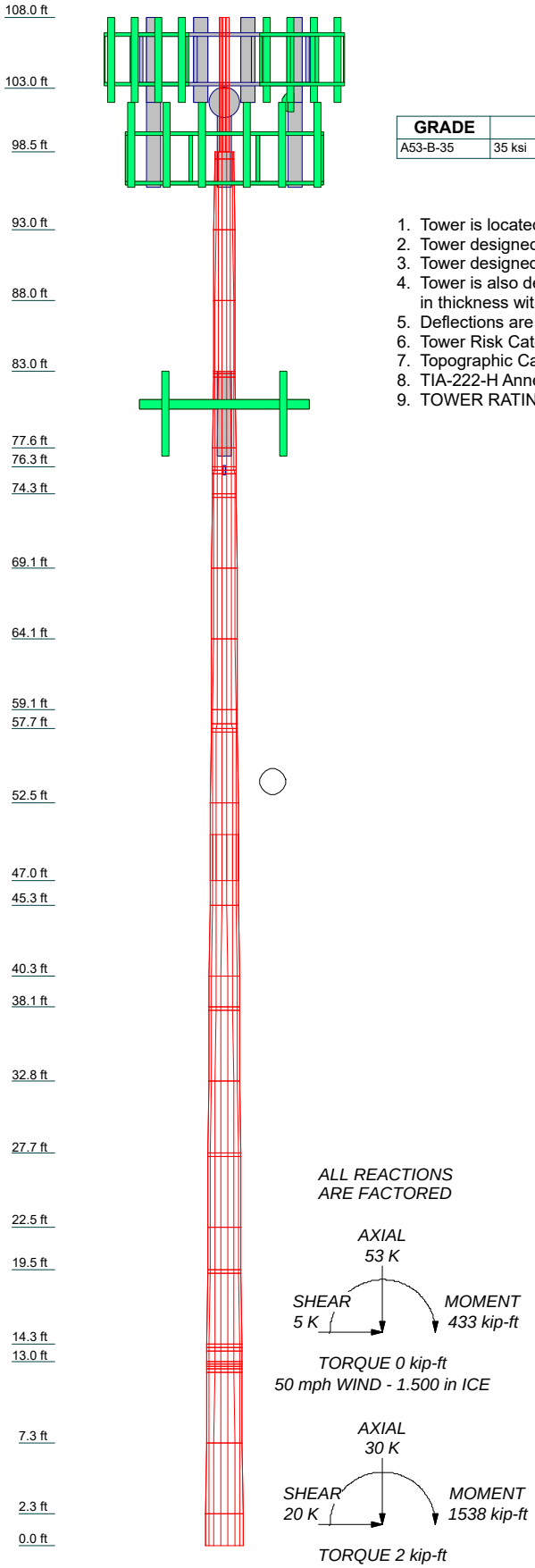
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Length (ft)	5.000	4.500	0.500	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.100	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	2.250
Number of Sides	0	0	0	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.313	0.313	0.313	0.188	0.188	0.188	0.188	0.188	0.356	0.188	0.188	0.188	0.188	0.188	0.575	0.550	0.537	0.537	0.537	0.537	0.575	0.575	0.625	0.613	0.613	0.613	0.700	0.725	0.725	0.700	0.688	0.800	0.775	0.775	0.775	0.775	0.775	0.775	0.775	0.787	0.775	0.762	
Socket Length (ft)																						3.250																							
Top Dia (in)	8.625	8.625	8.625	16.500	17.300	18.101	18.901	19.701	18.961	20.328	20.328	20.328	20.328	20.328	20.328	21.128	21.929	21.929	21.929	21.929	22.982	23.783	23.768	24.568	25.368	25.368	25.755	26.555	27.372	27.409	27.409	28.209	28.729	28.729	28.729	28.729	29.529	29.529	29.529	29.849	30.650	30.650	31.450
Bot Dia (in)	8.625	8.625	8.625	17.300	18.101	18.901	19.701	20.501	19.762	21.128	21.128	21.128	21.128	21.128	21.128	21.929	22.729	22.729	22.729	22.729	23.783	24.663	24.568	25.368	25.368	25.755	26.555	27.372	27.372	28.209	28.209	28.729	29.529	29.529	29.529	29.529	30.329	30.329	30.329	30.650	31.450	31.450	31.810
Grade	A53-B-35																					A607-65																							
Weight (K)	0.1	0.1	0.0	0.2	0.2	0.2	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.1	0.1	0.1	0.7	0.8	0.8	0.8	0.4	0.0	0.9	1.0	0.0	1.0	0.6	0.1	1.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	1.2	0.6	15.4



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 117 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 71.3%

ALL REACTIONS ARE FACTORED

AXIAL 53 K

SHEAR 5 K *MOMENT 433 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 30 K

SHEAR 20 K *MOMENT 1538 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 117 mph WIND

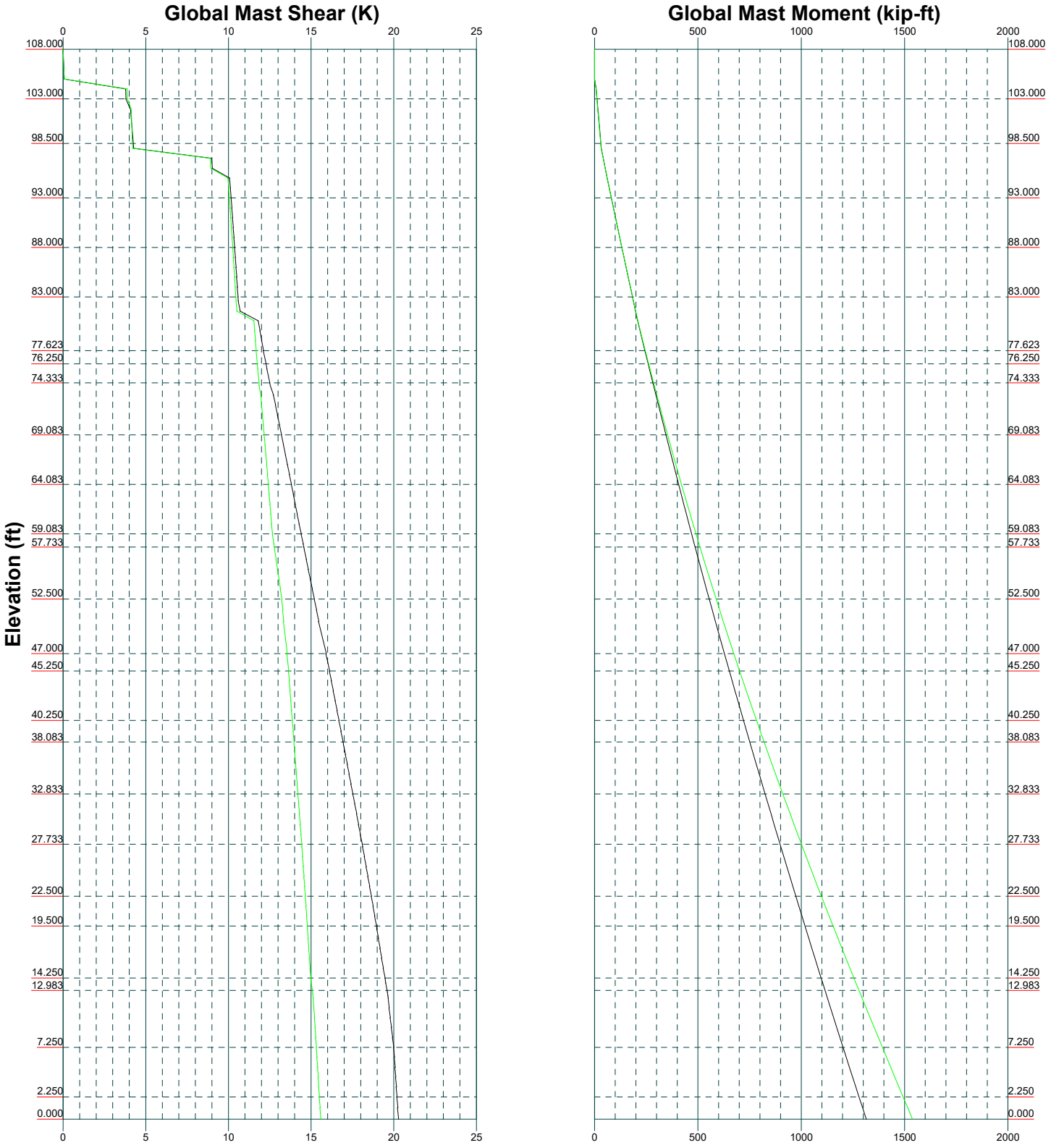
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***85565.013.01 - HARTFORD - NU (SSUSA), CT (BU# 87636***		
Project:			
Client: Crown Castle	Drawn by: Sinchana Upadhya	App'd:	
Code: TIA-222-H	Date: 11/01/21	Scale: NTS	
Path:		Dwg No. E-1	

TIA-222-H - 117 mph/50 mph 1.500 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



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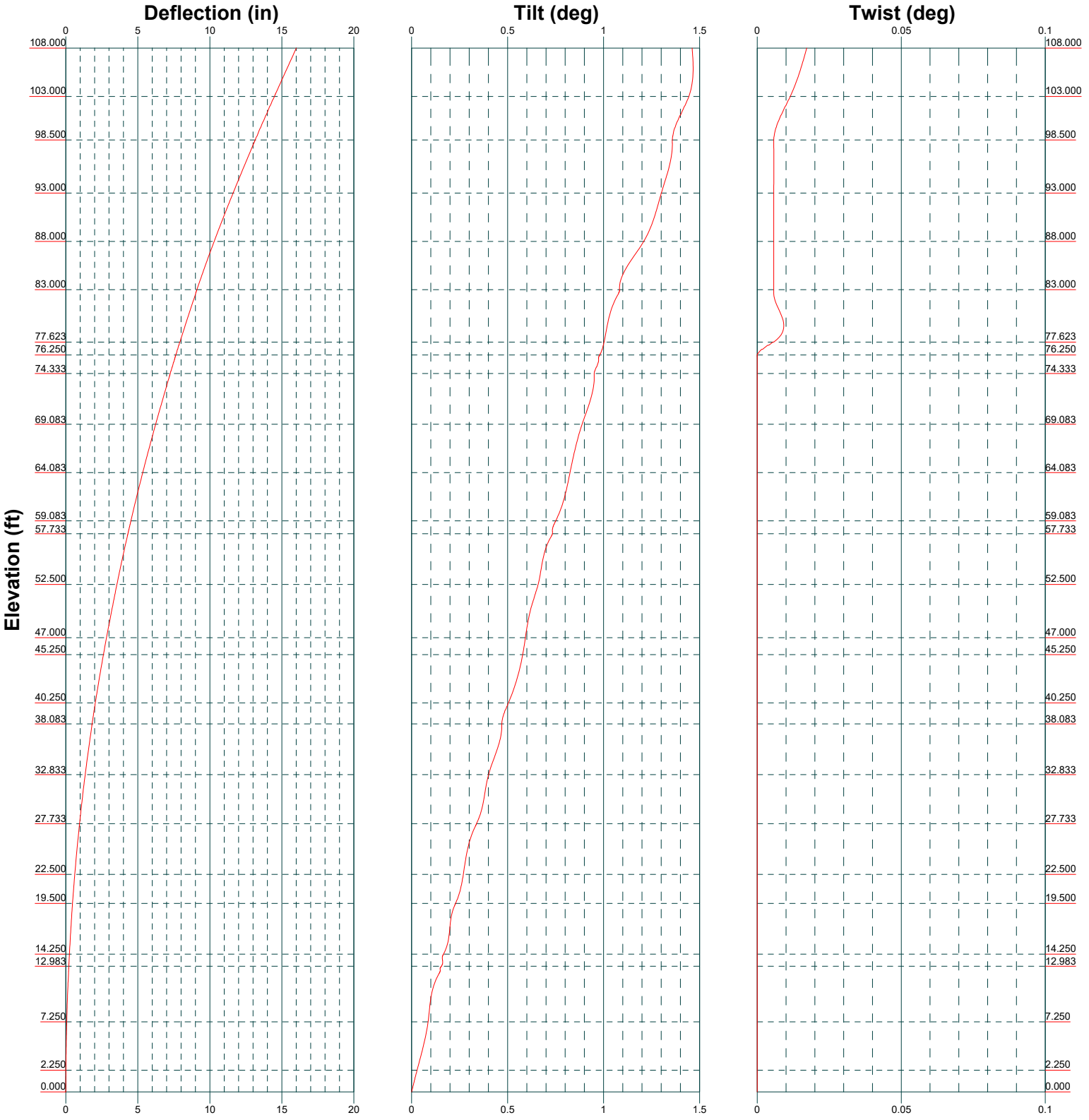
Job: 85565.013.01 - HARTFORD - NU (SSUSA), CT (BU# 87636.		
Project:		
Client: Crown Castle	Drawn by: Sinchana Upadhya	App'd:
Code: TIA-222-H	Date: 11/01/21	Scale: NTS
Path:		Dwg No. E-4

TIA-222-H - Service - 60 mph

Maximum Values



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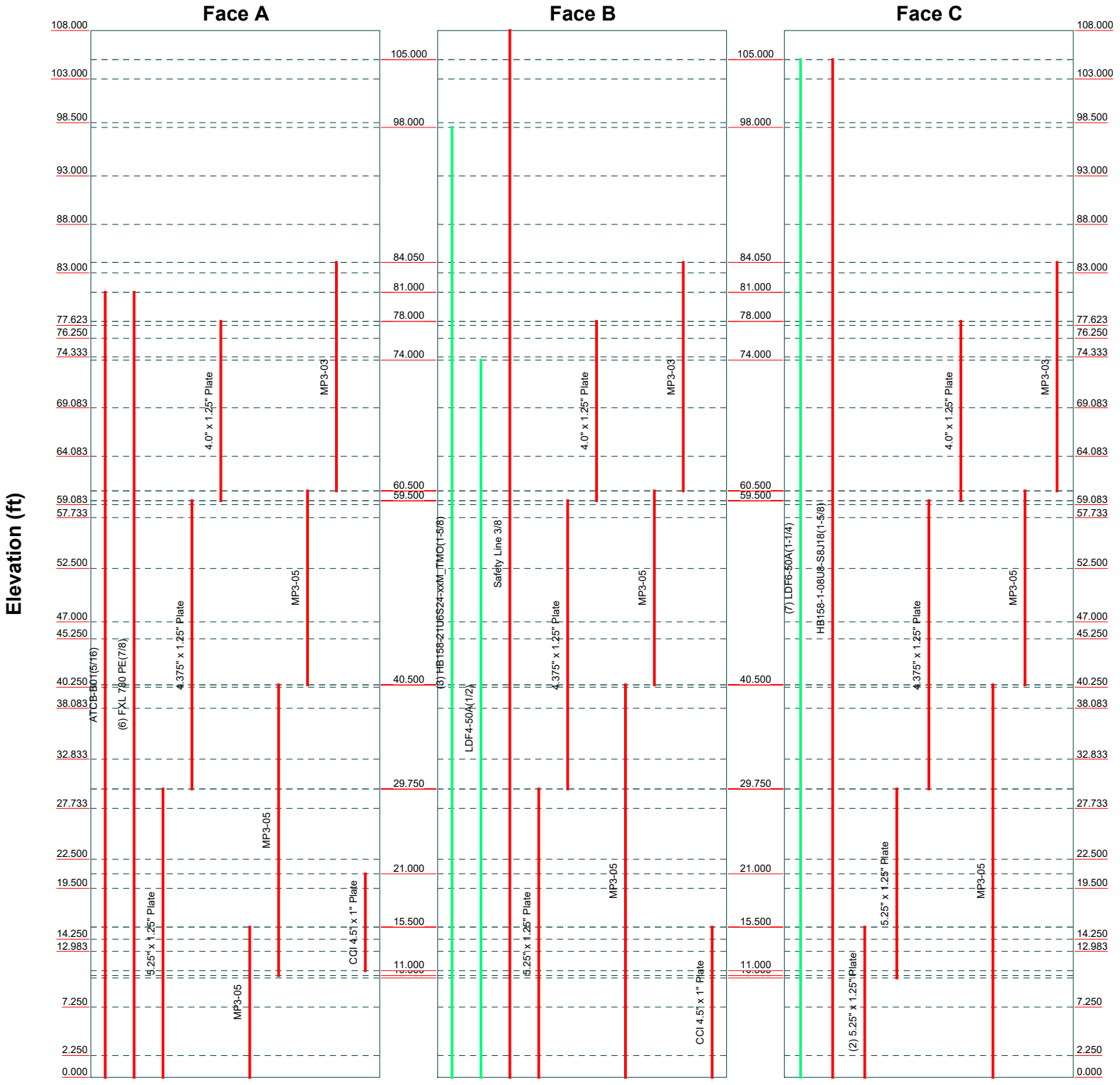
Job: ***85565.013.01 - HARTFORD - NU (SSUSA), CT (BU# 87636***		
Project:		
Client: Crown Castle	Drawn by: Sinchana Upadhya	App'd:
Code: TIA-222-H	Date: 11/01/21	Scale: NTS
Path:		Dwg No. E-5

Feed Line Distribution Chart
0' - 108'

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



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Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 85565.013.01 - HARTFORD - NU (SSUSA), CT (BU# 87636.			
Project:			
Client: Crown Castle	Drawn by: Sinchana Upadhya	App'd:	
Code: TIA-222-H	Date: 11/01/21	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 71.000 ft.
Basic wind speed of 117 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
TOWER RATING: 71.3%.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
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	108.000-103.000	5.000	0.000	Round	8.625	8.625	0.313		A53-B-35 (35 ksi)
L2	103.000-98.500	4.500	0.000	Round	8.625	8.625	0.313		A53-B-35 (35 ksi)
L3	98.500-98.000	0.500	0.000	Round	16.500	16.500	0.313		A53-B-35 (35 ksi)
L4	98.000-93.000	5.000	0.000	18	16.500	17.300	0.188	0.750	A607-65 (65 ksi)
L5	93.000-88.000	5.000	0.000	18	17.300	18.101	0.188	0.750	A607-65 (65 ksi)
L6	88.000-83.000	5.000	0.000	18	18.101	18.901	0.188	0.750	A607-65 (65 ksi)
L7	83.000-82.873	0.127	0.000	18	18.901	18.921	0.188	0.750	A607-65 (65 ksi)
L8	82.873-82.623	0.250	0.000	18	18.921	18.961	0.362	1.450	A607-65 (65 ksi)
L9	82.623-77.623	5.000	0.000	18	18.961	19.762	0.356	1.425	A607-65 (65 ksi)
L10	77.623-76.250	1.373	0.000	18	19.762	19.981	0.356	1.425	A607-65 (65 ksi)
L11	76.250-76.000	0.250	0.000	18	19.981	20.021	0.600	2.400	A607-65 (65 ksi)
L12	76.000-75.750	0.250	0.000	18	20.021	20.061	0.456	1.825	A607-65 (65 ksi)
L13	75.750-74.333	1.417	0.000	18	20.061	20.288	0.450	1.800	A607-65 (65 ksi)
L14	74.333-74.083	0.250	0.000	18	20.288	20.328	0.588	2.350	A607-65 (65 ksi)
L15	74.083-69.083	5.000	0.000	18	20.328	21.128	0.575	2.300	A607-65 (65 ksi)
L16	69.083-64.083	5.000	0.000	18	21.128	21.929	0.550	2.200	A607-65 (65 ksi)
L17	64.083-59.083	5.000	0.000	18	21.929	22.729	0.537	2.150	A607-65 (65 ksi)
L18	59.083-58.083	1.000	0.000	18	22.729	22.889	0.537	2.150	A607-65 (65 ksi)
L19	58.083-57.733	0.350	0.000	18	22.889	22.945	0.600	2.400	A607-65 (65 ksi)
L20	57.733-57.500	0.233	0.000	18	22.945	22.982	0.600	2.400	A607-65 (65 ksi)
L21	57.500-52.500	5.000	0.000	18	22.982	23.783	0.575	2.300	A607-65 (65 ksi)
L22	52.500-47.000	5.500	3.250	18	23.783	24.663	0.575	2.300	A607-65 (65 ksi)
L23	47.000-45.250	5.000	0.000	18	23.768	24.568	0.625	2.500	A607-65 (65 ksi)
L24	45.250-40.250	5.000	0.000	18	24.568	25.368	0.613	2.450	A607-65 (65 ksi)
L25	40.250-38.083	2.167	0.000	18	25.368	25.715	0.613	2.450	A607-65 (65 ksi)
L26	38.083-37.833	0.250	0.000	18	25.715	25.755	0.713	2.850	A607-65 (65 ksi)
L27	37.833-32.833	5.000	0.000	18	25.755	26.555	0.700	2.800	A607-65 (65 ksi)
L28	32.833-27.733	5.100	0.000	18	26.555	27.372	0.725	2.900	A607-65 (65 ksi)
L29	27.733-27.500	0.233	0.000	18	27.372	27.409	0.725	2.900	A607-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L30	27.500-22.500	5.000	0.000	18	27.409	28.209	0.700	2.800	A607-65 (65 ksi)
L31	22.500-19.500	3.000	0.000	18	28.209	28.689	0.688	2.750	A607-65 (65 ksi)
L32	19.500-19.250	0.250	0.000	18	28.689	28.729	0.800	3.200	A607-65 (65 ksi)
L33	19.250-14.250	5.000	0.000	18	28.729	29.529	0.775	3.100	A607-65 (65 ksi)
L34	14.250-14.000	0.250	0.000	18	29.529	29.569	0.775	3.100	A607-65 (65 ksi)
L35	14.000-13.750	0.250	0.000	18	29.569	29.609	0.775	3.100	A607-65 (65 ksi)
L36	13.750-12.983	0.767	0.000	18	29.609	29.732	1.075	4.300	A607-65 (65 ksi)
L37	12.983-12.817	0.166	0.000	18	29.732	29.759	0.950	3.800	A607-65 (65 ksi)
L38	12.817-12.650	0.167	0.000	18	29.759	29.785	0.850	3.400	A607-65 (65 ksi)
L39	12.650-12.500	0.150	0.000	18	29.785	29.809	0.850	3.400	A607-65 (65 ksi)
L40	12.500-12.250	0.250	0.000	18	29.809	29.849	0.800	3.200	A607-65 (65 ksi)
L41	12.250-7.250	5.000	0.000	18	29.849	30.650	0.787	3.150	A607-65 (65 ksi)
L42	7.250-2.250	5.000	0.000	18	30.650	31.450	0.775	3.100	A607-65 (65 ksi)
L43	2.250-0.000	2.250		18	31.450	31.810	0.762	3.050	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	8.625	8.161	70.586	2.941	4.313	16.368	141.172	4.078	0.000	0
	8.625	8.161	70.586	2.941	4.313	16.368	141.172	4.078	0.000	0
L2	8.625	8.161	70.586	2.941	4.313	16.368	141.172	4.078	0.000	0
	8.625	8.161	70.586	2.941	4.313	16.368	141.172	4.078	0.000	0
L3	16.500	15.892	520.728	5.724	8.250	63.119	1041.456	7.941	0.000	0
	16.500	15.892	520.728	5.724	8.250	63.119	1041.456	7.941	0.000	0
L4	16.726	9.708	326.368	5.791	8.382	38.937	653.165	4.855	2.574	13.728
	17.538	10.184	376.798	6.075	8.789	42.874	754.092	5.093	2.715	14.479
L5	17.538	10.184	376.798	6.075	8.789	42.874	754.092	5.093	2.715	14.479
	18.351	10.661	432.172	6.359	9.195	47.000	864.913	5.331	2.856	15.23
L6	18.351	10.661	432.172	6.359	9.195	47.000	864.913	5.331	2.856	15.23
	19.164	11.137	492.723	6.643	9.602	51.316	986.094	5.569	2.997	15.982
L7	19.164	11.137	492.723	6.643	9.602	51.316	986.094	5.569	2.997	15.982
	19.184	11.149	494.330	6.650	9.612	51.429	989.311	5.576	3.000	16.001
L8	19.157	21.353	929.171	6.588	9.612	96.668	1859.565	10.679	2.692	7.427
	19.198	21.399	935.194	6.603	9.632	97.089	1871.619	10.702	2.699	7.446
L9	19.199	21.037	919.997	6.605	9.632	95.512	1841.205	10.521	2.710	7.608
	20.011	21.942	1043.898	6.889	10.039	103.986	2089.170	10.973	2.851	8.003
L10	20.011	21.942	1043.898	6.889	10.039	103.986	2089.170	10.973	2.851	8.003
	20.235	22.191	1079.767	6.967	10.150	106.376	2160.956	11.097	2.890	8.111
L11	20.197	36.910	1751.632	6.880	10.150	172.566	3505.569	18.458	2.461	4.101
	20.238	36.986	1762.504	6.895	10.171	173.290	3527.327	18.496	2.468	4.113
L12	20.260	28.333	1370.218	6.946	10.171	134.721	2742.239	14.169	2.721	5.963
	20.300	28.391	1378.643	6.960	10.191	135.278	2759.099	14.198	2.728	5.979
L13	20.301	28.011	1361.058	6.962	10.191	133.553	2723.907	14.008	2.739	6.086

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
	20.532	28.335	1408.828	7.043	10.306	136.695	2819.509	14.170	2.779	6.175
L14	20.510	36.736	1801.322	6.994	10.306	174.778	3605.015	18.372	2.537	4.318
	20.551	36.811	1812.321	7.008	10.327	175.499	3627.026	18.409	2.544	4.33
L15	20.553	36.050	1777.132	7.012	10.327	172.091	3556.603	18.029	2.566	4.462
	21.366	37.511	2002.002	7.296	10.733	186.524	4006.639	18.759	2.707	4.707
L16	21.370	35.924	1921.955	7.305	10.733	179.066	3846.439	17.965	2.751	5.001
	22.182	37.321	2155.023	7.589	11.140	193.453	4312.881	18.664	2.891	5.257
L17	22.184	36.494	2109.741	7.594	11.140	189.388	4222.259	18.250	2.913	5.42
	22.997	37.859	2355.501	7.878	11.546	204.004	4714.102	18.933	3.054	5.682
L18	22.997	37.859	2355.501	7.878	11.546	204.004	4714.102	18.933	3.054	5.682
	23.159	38.132	2406.838	7.935	11.628	206.993	4816.843	19.070	3.082	5.735
L19	23.150	42.447	2664.228	7.913	11.628	229.129	5331.961	21.228	2.972	4.954
	23.206	42.554	2684.367	7.933	11.656	230.297	5372.266	21.281	2.982	4.971
L20	23.206	42.554	2684.367	7.933	11.656	230.297	5372.266	21.281	2.982	4.971
	23.244	42.625	2697.830	7.946	11.675	231.077	5399.210	21.317	2.989	4.981
L21	23.248	40.895	2594.093	7.955	11.675	222.191	5191.600	20.451	3.033	5.275
	24.061	42.355	2882.088	8.239	12.082	238.552	5767.968	21.182	3.174	5.52
L22	24.061	42.355	2882.088	8.239	12.082	238.552	5767.968	21.182	3.174	5.52
	24.955	43.962	3222.660	8.551	12.529	257.220	6449.560	21.985	3.329	5.789
L23	24.566	45.910	3106.509	8.216	12.074	257.288	6217.105	22.959	3.083	4.933
	24.851	47.497	3440.025	8.500	12.481	275.631	6884.576	23.753	3.224	5.158
L24	24.853	46.571	3376.507	8.504	12.481	270.541	6757.457	23.290	3.246	5.3
	25.665	48.127	3726.306	8.788	12.887	289.151	7457.514	24.068	3.387	5.529
L25	25.665	48.127	3726.306	8.788	12.887	289.151	7457.514	24.068	3.387	5.529
	26.017	48.801	3885.120	8.911	13.063	297.408	7775.353	24.405	3.448	5.629
L26	26.002	56.543	4465.629	8.876	13.063	341.847	8937.134	28.277	3.272	4.592
	26.042	56.633	4487.102	8.890	13.084	342.957	8980.108	28.322	3.279	4.602
L27	26.044	55.667	4414.986	8.895	13.084	337.445	8835.780	27.839	3.301	4.716
	26.857	57.445	4851.662	9.179	13.490	359.646	9709.709	28.728	3.442	4.917
L28	26.853	59.439	5010.374	9.170	13.490	371.412	10027.341	29.725	3.398	4.687
	27.682	61.318	5500.516	9.460	13.905	395.586	11008.269	30.665	3.541	4.885
L29	27.682	61.318	5500.516	9.460	13.905	395.586	11008.269	30.665	3.541	4.885
	27.720	61.403	5523.641	9.473	13.924	396.709	11054.550	30.708	3.548	4.894
L30	27.724	59.342	5348.175	9.482	13.924	384.107	10703.387	29.676	3.592	5.131
	28.536	61.120	5843.428	9.766	14.330	407.771	11694.545	30.566	3.733	5.333
L31	28.538	60.055	5746.908	9.770	14.330	401.035	11501.379	30.033	3.755	5.462
	29.026	61.103	6052.962	9.941	14.574	415.324	12113.888	30.557	3.839	5.584
L32	29.008	70.816	6958.893	9.901	14.574	477.484	13926.943	35.415	3.641	4.552
	29.049	70.918	6988.887	9.915	14.594	478.874	13986.970	35.466	3.648	4.56
L33	29.053	68.763	6788.682	9.924	14.594	465.156	13586.296	34.388	3.692	4.764
	29.865	70.731	7388.530	10.208	15.001	492.538	14786.782	35.372	3.833	4.946
L34	29.865	70.731	7388.530	10.208	15.001	492.538	14786.782	35.372	3.833	4.946
	29.906	70.830	7419.416	10.222	15.021	493.928	14848.594	35.422	3.840	4.955
L35	29.906	70.830	7419.416	10.222	15.021	493.928	14848.594	35.422	3.840	4.955
	29.947	70.928	7450.387	10.236	15.042	495.320	14910.578	35.471	3.847	4.964
L36	29.900	97.361	10015.188	10.130	15.042	665.834	20043.554	48.690	3.319	3.088
	30.025	97.780	10144.999	10.173	15.104	671.679	20303.347	48.899	3.341	3.108
L37	30.044	86.787	9083.179	10.218	15.104	601.378	18178.309	43.402	3.561	3.748
	30.071	86.867	9108.354	10.227	15.117	602.507	18228.694	43.442	3.566	3.753
L38	30.087	77.993	8234.741	10.263	15.117	544.718	16480.317	39.004	3.742	4.402
	30.114	78.065	8257.602	10.272	15.131	545.740	16526.070	39.040	3.746	4.407
L39	30.114	78.065	8257.602	10.272	15.131	545.740	16526.070	39.040	3.746	4.407
	30.138	78.130	8278.172	10.281	15.143	546.659	16567.237	39.072	3.750	4.412
L40	30.146	73.661	7831.646	10.298	15.143	517.172	15673.598	36.837	3.838	4.798
	30.187	73.762	7864.096	10.313	15.164	518.619	15738.540	36.888	3.846	4.807
L41	30.188	72.641	7751.217	10.317	15.164	511.175	15512.633	36.327	3.868	4.911
	31.001	74.641	8409.296	10.601	15.570	540.095	16829.657	37.328	4.008	5.09
L42	31.003	73.487	8286.212	10.606	15.570	532.190	16583.327	36.751	4.030	5.2
	31.816	75.456	8970.066	10.890	15.977	561.452	17951.934	37.735	4.171	5.382
L43	31.817	74.269	8836.181	10.894	15.977	553.072	17683.988	37.141	4.193	5.499
	32.183	75.140	9150.907	11.022	16.159	566.287	18313.854	37.577	4.257	5.582

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 108.000-103.000				1	1	1			
L2 103.000-98.500				1	1	1			
L3 98.500-98.000				1	1	1			
L4 98.000-93.000				1	1	1			
L5 93.000-88.000				1	1	1			
L6 88.000-83.000				1	1	1			
L7 83.000-82.873				1	1	1			
L8 82.873-82.623				1	1	0.931484			
L9 82.623-77.623				1	1	0.930137			
L10 77.623-76.250				1	1	0.925615			
L11 76.250-76.000				1	1	0.961567			
L12 76.000-75.750				1	1	1.15066			
L13 75.750-74.333				1	1	1.1577			
L14 74.333-74.083				1	1	0.971101			
L15 74.083-69.083				1	1	0.965671			
L16 69.083-64.083				1	1	0.983354			
L17 64.083-59.083				1	1	0.981949			
L18 59.083-58.083				1	1	0.977415			
L19 58.083-57.733				1	1	1.038			
L20 57.733-57.500				1	1	1.03679			
L21 57.500-52.500				1	1	1.05464			
L22 52.500-47.000				1	1	1.04351			
L23 47.000-45.250				1	1	1.05109			
L24 45.250-40.250				1	1	1.05053			
L25 40.250-38.083				1	1	1.04165			
L26 38.083-37.833				1	1	0.946367			
L27 37.833-32.833				1	1	0.944041			
L28				1	1	0.9485			

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
32.833-27.733 L29				1	1	0.947656			
27.733-27.500 L30				1	1	0.962447			
27.500-22.500 L31				1	1	0.968941			
22.500-19.500 L32				1	1	0.898748			
19.500-19.250 L33				1	1	0.910092			
19.250-14.250 L34				1	1	0.909276			
14.250-14.000 L35				1	1	0.908462			
14.000-13.750 L36				1	1	0.898029			
13.750-12.983 L37				1	1	0.946042			
12.983-12.817 L38				1	1	0.968915			
12.817-12.650 L39				1	1	0.968355			
12.650-12.500 L40				1	1	0.965111			
12.500-12.250 L41				1	1	0.962254			
12.250-7.250 L42				1	1	0.960284			
7.250-2.250 L43				1	1	0.968116			
2.250-0.000									

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 klf
HB158-1-08U8-S8J18(1-5/8) *	C	No	Surface Ar (CaAa)	105.000 - 0.000	1	1	0.000 0.300	1.980		0.001
ATCB-B01(5/16)	A	No	Surface Ar (CaAa)	81.000 - 0.000	1	1	0.380 0.400	0.315		0.000
FXL 780 PE(7/8) *	A	No	Surface Ar (CaAa)	81.000 - 0.000	6	3	0.330 0.500	1.090		0.000
Safety Line 3/8 *	B	No	Surface Ar (CaAa)	108.000 - 0.000	1	1	0.000 0.000	0.375		0.000
5.25" x 1.25" Plate	A	No	Surface Af (CaAa)	29.750 - 0.000	1	1	0.100 0.150	5.250	13.000	0.000
5.25" x 1.25" Plate	C	No	Surface Af (CaAa)	15.500 - 0.000	2	2	0.200 0.300	5.250	13.000	0.000
5.25" x 1.25" Plate	C	No	Surface Af (CaAa)	29.750 - 10.250	1	1	0.100 0.150	5.250	13.000	0.000

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 klf
5.25" x 1.25" Plate	B	No	Surface Af (CaAa)	29.750 - 0.000	1	1	0.050 0.100	5.250	13.000	0.000
*										
4.375" x 1.25" Plate	A	No	Surface Af (CaAa)	59.500 - 29.750	1	1	0.100 0.150	4.375	11.250	0.000
4.375" x 1.25" Plate	B	No	Surface Af (CaAa)	59.500 - 29.750	1	1	0.050 0.100	4.375	11.250	0.000
4.375" x 1.25" Plate	C	No	Surface Af (CaAa)	59.500 - 29.750	1	1	0.100 0.150	4.375	11.250	0.000
*										
4.0" x 1.25" Plate	A	No	Surface Af (CaAa)	78.000 - 59.500	1	1	0.100 0.150	4.000	10.500	0.000
4.0" x 1.25" Plate	B	No	Surface Af (CaAa)	78.000 - 59.500	1	1	0.050 0.100	4.000	10.500	0.000
4.0" x 1.25" Plate	C	No	Surface Af (CaAa)	78.000 - 59.500	1	1	0.100 0.150	4.000	10.500	0.000
*										
MP3-05	B	No	Surface Af (CaAa)	40.500 - 0.000	1	1	0.400 0.450	5.330	14.840	0.000
MP3-05	A	No	Surface Af (CaAa)	15.500 - 0.000	1	1	0.200 0.200	5.330	14.840	0.000
MP3-05	A	No	Surface Af (CaAa)	40.500 - 10.500	1	1	0.400 0.450	5.330	14.840	0.000
MP3-05	C	No	Surface Af (CaAa)	40.500 - 0.000	1	1	0.400 0.450	5.330	14.840	0.000
*										
MP3-05	A	No	Surface Af (CaAa)	60.500 - 40.500	1	1	0.400 0.450	5.330	14.840	0.000
MP3-05	B	No	Surface Af (CaAa)	60.500 - 40.500	1	1	0.400 0.450	5.330	14.840	0.000
MP3-05	C	No	Surface Af (CaAa)	60.500 - 40.500	1	1	0.400 0.450	5.330	14.840	0.000
*										
MP3-03	A	No	Surface Af (CaAa)	84.050 - 60.500	1	1	0.400 0.450	4.060	11.260	0.000
MP3-03	B	No	Surface Af (CaAa)	84.050 - 60.500	1	1	0.400 0.450	4.060	11.260	0.000
MP3-03	C	No	Surface Af (CaAa)	84.050 - 60.500	1	1	0.400 0.450	4.060	11.260	0.000
*										
CCI 4.5" x 1" Plate	B	No	Surface Af (CaAa)	15.500 - 0.000	1	1	0.350 0.400	4.500	11.000	0.000
CCI 4.5" x 1" Plate	A	No	Surface Af (CaAa)	21.000 - 11.000	1	1	0.000 0.050	4.500	11.000	0.000
*										

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 klf
LDF6-50A(1-1/4)	C	No	No	Inside Pole	105.000 - 0.000	7	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
HB158-21U6S24-xx M_TMO(1-5/8)	B	No	No	Inside Pole	98.000 - 0.000	3	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
*									
LDF4-50A(1/2)	B	No	No	Inside Pole	74.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
*									

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	108.000-103.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.188	0.000	0.001
		C	0.000	0.000	0.396	0.000	0.011
L2	103.000-98.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.169	0.000	0.001
		C	0.000	0.000	0.891	0.000	0.025
L3	98.500-98.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.019	0.000	0.000
		C	0.000	0.000	0.099	0.000	0.003
L4	98.000-93.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.188	0.000	0.039
		C	0.000	0.000	0.990	0.000	0.028
L5	93.000-88.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.188	0.000	0.039
		C	0.000	0.000	0.990	0.000	0.028
L6	88.000-83.000	A	0.000	0.000	0.711	0.000	0.000
		B	0.000	0.000	0.898	0.000	0.039
		C	0.000	0.000	1.700	0.000	0.028
L7	83.000-82.873	A	0.000	0.000	0.086	0.000	0.000
		B	0.000	0.000	0.091	0.000	0.001
		C	0.000	0.000	0.111	0.000	0.001
L8	82.873-82.623	A	0.000	0.000	0.169	0.000	0.000
		B	0.000	0.000	0.179	0.000	0.002
		C	0.000	0.000	0.219	0.000	0.001
L9	82.623-77.623	A	0.000	0.000	4.845	0.000	0.005
		B	0.000	0.000	3.822	0.000	0.039
		C	0.000	0.000	4.625	0.000	0.028
L10	77.623-76.250	A	0.000	0.000	2.337	0.000	0.002
		B	0.000	0.000	1.896	0.000	0.011
		C	0.000	0.000	2.116	0.000	0.008
L11	76.250-76.000	A	0.000	0.000	0.425	0.000	0.000
		B	0.000	0.000	0.345	0.000	0.002
		C	0.000	0.000	0.385	0.000	0.001
L12	76.000-75.750	A	0.000	0.000	0.425	0.000	0.000
		B	0.000	0.000	0.345	0.000	0.002
		C	0.000	0.000	0.385	0.000	0.001
L13	75.750-74.333	A	0.000	0.000	2.411	0.000	0.002
		B	0.000	0.000	1.957	0.000	0.011
		C	0.000	0.000	2.184	0.000	0.008
L14	74.333-74.083	A	0.000	0.000	0.425	0.000	0.000
		B	0.000	0.000	0.345	0.000	0.002

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
		C	0.000	0.000	0.385	0.000	0.001
L15	74.083-69.083	A	0.000	0.000	8.509	0.000	0.008
		B	0.000	0.000	6.904	0.000	0.039
		C	0.000	0.000	7.707	0.000	0.028
L16	69.083-64.083	A	0.000	0.000	8.509	0.000	0.008
		B	0.000	0.000	6.904	0.000	0.039
		C	0.000	0.000	7.707	0.000	0.028
L17	64.083-59.083	A	0.000	0.000	8.835	0.000	0.008
		B	0.000	0.000	7.230	0.000	0.039
		C	0.000	0.000	8.033	0.000	0.028
L18	59.083-58.083	A	0.000	0.000	1.976	0.000	0.002
		B	0.000	0.000	1.655	0.000	0.008
		C	0.000	0.000	1.816	0.000	0.005
L19	58.083-57.733	A	0.000	0.000	0.692	0.000	0.001
		B	0.000	0.000	0.579	0.000	0.003
		C	0.000	0.000	0.635	0.000	0.002
L20	57.733-57.500	A	0.000	0.000	0.460	0.000	0.000
		B	0.000	0.000	0.386	0.000	0.002
		C	0.000	0.000	0.423	0.000	0.001
L21	57.500-52.500	A	0.000	0.000	9.880	0.000	0.008
		B	0.000	0.000	8.275	0.000	0.039
		C	0.000	0.000	9.078	0.000	0.028
L22	52.500-47.000	A	0.000	0.000	10.868	0.000	0.009
		B	0.000	0.000	9.102	0.000	0.043
		C	0.000	0.000	9.985	0.000	0.030
L23	47.000-45.250	A	0.000	0.000	3.458	0.000	0.003
		B	0.000	0.000	2.896	0.000	0.014
		C	0.000	0.000	3.177	0.000	0.010
L24	45.250-40.250	A	0.000	0.000	9.880	0.000	0.008
		B	0.000	0.000	8.275	0.000	0.039
		C	0.000	0.000	9.078	0.000	0.028
L25	40.250-38.083	A	0.000	0.000	4.282	0.000	0.003
		B	0.000	0.000	3.586	0.000	0.017
		C	0.000	0.000	3.934	0.000	0.012
L26	38.083-37.833	A	0.000	0.000	0.494	0.000	0.000
		B	0.000	0.000	0.414	0.000	0.002
		C	0.000	0.000	0.454	0.000	0.001
L27	37.833-32.833	A	0.000	0.000	9.880	0.000	0.008
		B	0.000	0.000	8.275	0.000	0.039
		C	0.000	0.000	9.078	0.000	0.028
L28	32.833-27.733	A	0.000	0.000	10.372	0.000	0.008
		B	0.000	0.000	8.735	0.000	0.040
		C	0.000	0.000	9.553	0.000	0.028
L29	27.733-27.500	A	0.000	0.000	0.494	0.000	0.000
		B	0.000	0.000	0.420	0.000	0.002
		C	0.000	0.000	0.457	0.000	0.001
L30	27.500-22.500	A	0.000	0.000	10.609	0.000	0.008
		B	0.000	0.000	9.004	0.000	0.039
		C	0.000	0.000	9.807	0.000	0.028
L31	22.500-19.500	A	0.000	0.000	7.490	0.000	0.005
		B	0.000	0.000	5.402	0.000	0.024
		C	0.000	0.000	5.884	0.000	0.017
L32	19.500-19.250	A	0.000	0.000	0.718	0.000	0.000
		B	0.000	0.000	0.450	0.000	0.002
		C	0.000	0.000	0.490	0.000	0.001
L33	19.250-14.250	A	0.000	0.000	15.470	0.000	0.008
		B	0.000	0.000	9.942	0.000	0.039
		C	0.000	0.000	11.994	0.000	0.028
L34	14.250-14.000	A	0.000	0.000	0.940	0.000	0.000
		B	0.000	0.000	0.638	0.000	0.002
		C	0.000	0.000	0.928	0.000	0.001

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
L35	14.000-13.750	A	0.000	0.000	0.940	0.000	0.000
		B	0.000	0.000	0.638	0.000	0.002
		C	0.000	0.000	0.928	0.000	0.001
L36	13.750-12.983	A	0.000	0.000	2.884	0.000	0.001
		B	0.000	0.000	1.956	0.000	0.006
		C	0.000	0.000	2.847	0.000	0.004
L37	12.983-12.817	A	0.000	0.000	0.624	0.000	0.000
		B	0.000	0.000	0.423	0.000	0.001
		C	0.000	0.000	0.616	0.000	0.001
L38	12.817-12.650	A	0.000	0.000	0.628	0.000	0.000
		B	0.000	0.000	0.426	0.000	0.001
		C	0.000	0.000	0.620	0.000	0.001
L39	12.650-12.500	A	0.000	0.000	0.564	0.000	0.000
		B	0.000	0.000	0.383	0.000	0.001
		C	0.000	0.000	0.557	0.000	0.001
L40	12.500-12.250	A	0.000	0.000	0.940	0.000	0.000
		B	0.000	0.000	0.638	0.000	0.002
		C	0.000	0.000	0.928	0.000	0.001
L41	12.250-7.250	A	0.000	0.000	13.101	0.000	0.008
		B	0.000	0.000	12.754	0.000	0.039
		C	0.000	0.000	15.932	0.000	0.028
L42	7.250-2.250	A	0.000	0.000	10.609	0.000	0.008
		B	0.000	0.000	12.754	0.000	0.039
		C	0.000	0.000	14.182	0.000	0.028
L43	2.250-0.000	A	0.000	0.000	4.774	0.000	0.004
		B	0.000	0.000	5.739	0.000	0.018
		C	0.000	0.000	6.382	0.000	0.012

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	108.000-103.000	A	1.432	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.620	0.000	0.017
		C		0.000	0.000	0.969	0.000	0.023
L2	103.000-98.500	A	1.426	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.452	0.000	0.015
		C		0.000	0.000	2.174	0.000	0.051
L3	98.500-98.000	A	1.422	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.161	0.000	0.002
		C		0.000	0.000	0.241	0.000	0.006
L4	98.000-93.000	A	1.418	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.605	0.000	0.054
		C		0.000	0.000	2.408	0.000	0.057
L5	93.000-88.000	A	1.410	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	1.598	0.000	0.054
		C		0.000	0.000	2.400	0.000	0.057
L6	88.000-83.000	A	1.402	0.000	0.000	1.005	0.000	0.009
		B		0.000	0.000	2.595	0.000	0.063
		C		0.000	0.000	3.397	0.000	0.066
L7	83.000-82.873	A	1.398	0.000	0.000	0.121	0.000	0.001
		B		0.000	0.000	0.162	0.000	0.003
		C		0.000	0.000	0.182	0.000	0.003
L8	82.873-82.623	A	1.398	0.000	0.000	0.239	0.000	0.002
		B		0.000	0.000	0.318	0.000	0.005
		C		0.000	0.000	0.358	0.000	0.005
L9	82.623-77.623	A	1.393	0.000	0.000	8.737	0.000	0.091

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	6.714	0.000	0.102
		C		0.000	0.000	7.516	0.000	0.104
L10	77.623-76.250	A	1.388	0.000	0.000	4.068	0.000	0.041
		B		0.000	0.000	3.039	0.000	0.039
		C		0.000	0.000	3.259	0.000	0.039
L11	76.250-76.000	A	1.386	0.000	0.000	0.740	0.000	0.008
		B		0.000	0.000	0.553	0.000	0.007
		C		0.000	0.000	0.593	0.000	0.007
L12	76.000-75.750	A	1.386	0.000	0.000	0.740	0.000	0.008
		B		0.000	0.000	0.553	0.000	0.007
		C		0.000	0.000	0.593	0.000	0.007
L13	75.750-74.333	A	1.384	0.000	0.000	4.194	0.000	0.043
		B		0.000	0.000	3.133	0.000	0.040
		C		0.000	0.000	3.361	0.000	0.040
L14	74.333-74.083	A	1.383	0.000	0.000	0.740	0.000	0.007
		B		0.000	0.000	0.553	0.000	0.007
		C		0.000	0.000	0.593	0.000	0.007
L15	74.083-69.083	A	1.378	0.000	0.000	14.773	0.000	0.149
		B		0.000	0.000	11.037	0.000	0.140
		C		0.000	0.000	11.840	0.000	0.142
L16	69.083-64.083	A	1.368	0.000	0.000	14.731	0.000	0.148
		B		0.000	0.000	11.007	0.000	0.139
		C		0.000	0.000	11.810	0.000	0.141
L17	64.083-59.083	A	1.357	0.000	0.000	15.011	0.000	0.149
		B		0.000	0.000	11.301	0.000	0.141
		C		0.000	0.000	12.104	0.000	0.143
L18	59.083-58.083	A	1.350	0.000	0.000	3.206	0.000	0.031
		B		0.000	0.000	2.465	0.000	0.030
		C		0.000	0.000	2.626	0.000	0.030
L19	58.083-57.733	A	1.349	0.000	0.000	1.121	0.000	0.011
		B		0.000	0.000	0.862	0.000	0.010
		C		0.000	0.000	0.919	0.000	0.011
L20	57.733-57.500	A	1.348	0.000	0.000	0.746	0.000	0.007
		B		0.000	0.000	0.574	0.000	0.007
		C		0.000	0.000	0.611	0.000	0.007
L21	57.500-52.500	A	1.342	0.000	0.000	15.991	0.000	0.156
		B		0.000	0.000	12.300	0.000	0.148
		C		0.000	0.000	13.103	0.000	0.149
L22	52.500-47.000	A	1.328	0.000	0.000	17.528	0.000	0.169
		B		0.000	0.000	13.486	0.000	0.161
		C		0.000	0.000	14.369	0.000	0.162
L23	47.000-45.250	A	1.318	0.000	0.000	5.577	0.000	0.054
		B		0.000	0.000	4.291	0.000	0.051
		C		0.000	0.000	4.572	0.000	0.052
L24	45.250-40.250	A	1.308	0.000	0.000	15.849	0.000	0.151
		B		0.000	0.000	12.200	0.000	0.144
		C		0.000	0.000	13.003	0.000	0.145
L25	40.250-38.083	A	1.297	0.000	0.000	6.848	0.000	0.065
		B		0.000	0.000	5.273	0.000	0.062
		C		0.000	0.000	5.621	0.000	0.062
L26	38.083-37.833	A	1.293	0.000	0.000	0.789	0.000	0.007
		B		0.000	0.000	0.608	0.000	0.007
		C		0.000	0.000	0.648	0.000	0.007
L27	37.833-32.833	A	1.284	0.000	0.000	15.744	0.000	0.147
		B		0.000	0.000	12.126	0.000	0.142
		C		0.000	0.000	12.929	0.000	0.142
L28	32.833-27.733	A	1.264	0.000	0.000	16.268	0.000	0.149
		B		0.000	0.000	12.603	0.000	0.144
		C		0.000	0.000	13.421	0.000	0.145
L29	27.733-27.500	A	1.252	0.000	0.000	0.761	0.000	0.007
		B		0.000	0.000	0.595	0.000	0.007

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
		C		0.000	0.000	0.632	0.000	0.007
L30	27.500-22.500	A	1.240	0.000	0.000	16.288	0.000	0.145
		B		0.000	0.000	12.724	0.000	0.141
		C		0.000	0.000	13.527	0.000	0.142
L31	22.500-19.500	A	1.219	0.000	0.000	11.054	0.000	0.096
		B		0.000	0.000	7.596	0.000	0.083
		C		0.000	0.000	8.078	0.000	0.083
L32	19.500-19.250	A	1.209	0.000	0.000	1.030	0.000	0.009
		B		0.000	0.000	0.632	0.000	0.007
		C		0.000	0.000	0.672	0.000	0.007
L33	19.250-14.250	A	1.191	0.000	0.000	21.919	0.000	0.186
		B		0.000	0.000	13.813	0.000	0.145
		C		0.000	0.000	13.381	0.000	0.152
L34	14.250-14.000	A	1.171	0.000	0.000	1.300	0.000	0.011
		B		0.000	0.000	0.872	0.000	0.008
		C		0.000	0.000	0.666	0.000	0.010
L35	14.000-13.750	A	1.169	0.000	0.000	1.300	0.000	0.011
		B		0.000	0.000	0.872	0.000	0.008
		C		0.000	0.000	0.666	0.000	0.010
L36	13.750-12.983	A	1.165	0.000	0.000	3.983	0.000	0.033
		B		0.000	0.000	2.671	0.000	0.026
		C		0.000	0.000	2.040	0.000	0.030
L37	12.983-12.817	A	1.161	0.000	0.000	0.861	0.000	0.007
		B		0.000	0.000	0.578	0.000	0.006
		C		0.000	0.000	0.441	0.000	0.006
L38	12.817-12.650	A	1.159	0.000	0.000	0.866	0.000	0.007
		B		0.000	0.000	0.581	0.000	0.006
		C		0.000	0.000	0.444	0.000	0.007
L39	12.650-12.500	A	1.158	0.000	0.000	0.778	0.000	0.006
		B		0.000	0.000	0.522	0.000	0.005
		C		0.000	0.000	0.398	0.000	0.006
L40	12.500-12.250	A	1.156	0.000	0.000	1.296	0.000	0.011
		B		0.000	0.000	0.869	0.000	0.008
		C		0.000	0.000	0.664	0.000	0.010
L41	12.250-7.250	A	1.129	0.000	0.000	18.836	0.000	0.153
		B		0.000	0.000	17.268	0.000	0.163
		C		0.000	0.000	9.890	0.000	0.167
L42	7.250-2.250	A	1.050	0.000	0.000	15.462	0.000	0.119
		B		0.000	0.000	16.955	0.000	0.152
		C		0.000	0.000	7.532	0.000	0.141
L43	2.250-0.000	A	0.909	0.000	0.000	6.696	0.000	0.046
		B		0.000	0.000	7.376	0.000	0.060
		C		0.000	0.000	3.263	0.000	0.056

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	108.000-103.000	0.030	0.575	0.567	0.149
L2	103.000-98.500	-0.267	1.371	0.238	0.876
L3	98.500-98.000	-0.275	1.492	0.356	1.052
L4	98.000-93.000	-0.233	1.265	0.356	1.049
L5	93.000-88.000	-0.233	1.269	0.362	1.060
L6	88.000-83.000	-0.178	0.971	0.305	0.889
L7	83.000-82.873	-0.095	0.520	0.189	0.549
L8	82.873-82.623	-0.095	0.521	0.189	0.549
L9	82.623-77.623	-0.215	-0.218	-0.050	-0.606

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L10	77.623-76.250	-0.231	-0.575	-0.141	-0.953
L11	76.250-76.000	-0.204	-0.509	-0.142	-0.957
L12	76.000-75.750	-0.232	-0.579	-0.142	-0.959
L13	75.750-74.333	-0.233	-0.582	-0.143	-0.963
L14	74.333-74.083	-0.235	-0.584	-0.143	-0.968
L15	74.083-69.083	-0.238	-0.593	-0.145	-0.982
L16	69.083-64.083	-0.244	-0.610	-0.149	-1.008
L17	64.083-59.083	-0.243	-0.608	-0.150	-1.016
L18	59.083-58.083	-0.201	-0.512	-0.147	-0.985
L19	58.083-57.733	-0.202	-0.513	-0.147	-0.987
L20	57.733-57.500	-0.202	-0.514	-0.147	-0.989
L21	57.500-52.500	-0.205	-0.521	-0.149	-1.002
L22	52.500-47.000	-0.238	-0.607	-0.153	-1.027
L23	47.000-45.250	-0.240	-0.610	-0.154	-1.034
L24	45.250-40.250	-0.243	-0.620	-0.157	-1.046
L25	40.250-38.083	-0.247	-0.631	-0.160	-1.061
L26	38.083-37.833	-0.248	-0.634	-0.161	-1.067
L27	37.833-32.833	-0.251	-0.642	-0.163	-1.077
L28	32.833-27.733	-0.255	-0.662	-0.167	-1.094
L29	27.733-27.500	-0.256	-0.679	-0.170	-1.101
L30	27.500-22.500	-0.259	-0.687	-0.173	-1.110
L31	22.500-19.500	-0.813	-1.071	-0.599	-1.392
L32	19.500-19.250	-1.319	-1.416	-0.996	-1.649
L33	19.250-14.250	-1.742	-0.941	-0.821	-1.619
L34	14.250-14.000	-2.389	0.090	-0.392	-1.525
L35	14.000-13.750	-2.392	0.091	-0.393	-1.526
L36	13.750-12.983	-2.383	0.090	-0.392	-1.521
L37	12.983-12.817	-2.393	0.091	-0.394	-1.527
L38	12.817-12.650	-2.400	0.091	-0.395	-1.531
L39	12.650-12.500	-2.402	0.091	-0.395	-1.532
L40	12.500-12.250	-2.406	0.091	-0.396	-1.534
L41	12.250-7.250	-2.596	0.909	-0.036	-1.101
L42	7.250-2.250	-2.681	1.261	0.123	-0.987
L43	2.250-0.000	-2.720	1.279	0.114	-0.970

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	HB158-1-08U8-S8J18(1-5/8)	103.00 - 105.00	1.0000	1.0000
L1	12	Safety Line 3/8	103.00 - 108.00	1.0000	1.0000
L2	2	HB158-1-08U8-S8J18(1-5/8)	98.50 - 103.00	1.0000	1.0000
L2	12	Safety Line 3/8	98.50 - 103.00	1.0000	1.0000
L3	2	HB158-1-08U8-S8J18(1-5/8)	98.00 - 98.50	1.0000	1.0000
L3	12	Safety Line 3/8	98.00 - 98.50	1.0000	1.0000
L4	2	HB158-1-08U8-S8J18(1-5/8)	93.00 - 98.00	1.0000	1.0000
L4	12	Safety Line 3/8	93.00 - 98.00	1.0000	1.0000
L5	2	HB158-1-08U8-S8J18(1-5/8)	88.00 - 93.00	1.0000	1.0000
L5	12	Safety Line 3/8	88.00 - 93.00	1.0000	1.0000
L6	2	HB158-1-08U8-S8J18(1-5/8)	83.00 - 88.00	1.0000	1.0000
L6	12	Safety Line 3/8	83.00 - 88.00	1.0000	1.0000
L6	36	MP3-03	83.00 - 84.05	1.0000	1.0000
L6	37	MP3-03	83.00 - 84.05	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L6	38	MP3-03	83.00 - 84.05	1.0000	1.0000
L7	2	HB158-1-08U8-S8J18(1-5/8)	82.87 - 83.00	1.0000	1.0000
L7	12	Safety Line 3/8	82.87 - 83.00	1.0000	1.0000
L7	36	MP3-03	82.87 - 83.00	1.0000	1.0000
L7	37	MP3-03	82.87 - 83.00	1.0000	1.0000
L7	38	MP3-03	82.87 - 83.00	1.0000	1.0000
L8	2	HB158-1-08U8-S8J18(1-5/8)	82.62 - 82.87	1.0000	1.0000
L8	12	Safety Line 3/8	82.62 - 82.87	1.0000	1.0000
L8	36	MP3-03	82.62 - 82.87	1.0000	1.0000
L8	37	MP3-03	82.62 - 82.87	1.0000	1.0000
L8	38	MP3-03	82.62 - 82.87	1.0000	1.0000
L9	2	HB158-1-08U8-S8J18(1-5/8)	77.62 - 82.62	1.0000	1.0000
L9	7	ATCB-B01(5/16)	77.62 - 81.00	1.0000	1.0000
L9	8	FXL 780 PE(7/8)	77.62 - 81.00	1.0000	1.0000
L9	12	Safety Line 3/8	77.62 - 82.62	1.0000	1.0000
L9	23	4.0" x 1.25" Plate	77.62 - 78.00	1.0000	1.0000
L9	24	4.0" x 1.25" Plate	77.62 - 78.00	1.0000	1.0000
L9	25	4.0" x 1.25" Plate	77.62 - 78.00	1.0000	1.0000
L9	36	MP3-03	77.62 - 82.62	1.0000	1.0000
L9	37	MP3-03	77.62 - 82.62	1.0000	1.0000
L9	38	MP3-03	77.62 - 82.62	1.0000	1.0000
L10	2	HB158-1-08U8-S8J18(1-5/8)	76.25 - 77.62	1.0000	1.0000
L10	7	ATCB-B01(5/16)	76.25 - 77.62	1.0000	1.0000
L10	8	FXL 780 PE(7/8)	76.25 - 77.62	1.0000	1.0000
L10	12	Safety Line 3/8	76.25 - 77.62	1.0000	1.0000
L10	23	4.0" x 1.25" Plate	76.25 - 77.62	1.0000	1.0000
L10	24	4.0" x 1.25" Plate	76.25 - 77.62	1.0000	1.0000
L10	25	4.0" x 1.25" Plate	76.25 - 77.62	1.0000	1.0000
L10	36	MP3-03	76.25 - 77.62	1.0000	1.0000
L10	37	MP3-03	76.25 - 77.62	1.0000	1.0000
L10	38	MP3-03	76.25 - 77.62	1.0000	1.0000
L11	2	HB158-1-08U8-S8J18(1-5/8)	76.00 - 76.25	1.0000	1.0000
L11	7	ATCB-B01(5/16)	76.00 - 76.25	1.0000	1.0000
L11	8	FXL 780 PE(7/8)	76.00 - 76.25	1.0000	1.0000
L11	12	Safety Line 3/8	76.00 - 76.25	1.0000	1.0000
L11	23	4.0" x 1.25" Plate	76.00 - 76.25	1.0000	1.0000
L11	24	4.0" x 1.25" Plate	76.00 - 76.25	1.0000	1.0000
L11	25	4.0" x 1.25" Plate	76.00 - 76.25	1.0000	1.0000
L11	36	MP3-03	76.00 - 76.25	1.0000	1.0000
L11	37	MP3-03	76.00 - 76.25	1.0000	1.0000
L11	38	MP3-03	76.00 - 76.25	1.0000	1.0000
L12	2	HB158-1-08U8-S8J18(1-5/8)	75.75 - 76.00	1.0000	1.0000
L12	7	ATCB-B01(5/16)	75.75 - 76.00	1.0000	1.0000
L12	8	FXL 780 PE(7/8)	75.75 - 76.00	1.0000	1.0000
L12	12	Safety Line 3/8	75.75 - 76.00	1.0000	1.0000
L12	23	4.0" x 1.25" Plate	75.75 - 76.00	1.0000	1.0000
L12	24	4.0" x 1.25" Plate	75.75 - 76.00	1.0000	1.0000
L12	25	4.0" x 1.25" Plate	75.75 - 76.00	1.0000	1.0000
L12	36	MP3-03	75.75 - 76.00	1.0000	1.0000
L12	37	MP3-03	75.75 - 76.00	1.0000	1.0000
L12	38	MP3-03	75.75 - 76.00	1.0000	1.0000
L13	2	HB158-1-08U8-S8J18(1-5/8)	74.33 - 75.75	1.0000	1.0000
L13	7	ATCB-B01(5/16)	74.33 - 75.75	1.0000	1.0000
L13	8	FXL 780 PE(7/8)	74.33 - 75.75	1.0000	1.0000
L13	12	Safety Line 3/8	74.33 - 75.75	1.0000	1.0000
L13	23	4.0" x 1.25" Plate	74.33 - 75.75	1.0000	1.0000
L13	24	4.0" x 1.25" Plate	74.33 - 75.75	1.0000	1.0000
L13	25	4.0" x 1.25" Plate	74.33 - 75.75	1.0000	1.0000
L13	36	MP3-03	74.33 - 75.75	1.0000	1.0000
L13	37	MP3-03	74.33 - 75.75	1.0000	1.0000
L13	38	MP3-03	74.33 - 75.75	1.0000	1.0000
L14	2	HB158-1-08U8-S8J18(1-5/8)	74.08 - 74.33	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	7	ATCB-B01(5/16)	74.08 - 74.33	1.0000	1.0000
L14	8	FXL 780 PE(7/8)	74.08 - 74.33	1.0000	1.0000
L14	12	Safety Line 3/8	74.08 - 74.33	1.0000	1.0000
L14	23	4.0" x 1.25" Plate	74.08 - 74.33	1.0000	1.0000
L14	24	4.0" x 1.25" Plate	74.08 - 74.33	1.0000	1.0000
L14	25	4.0" x 1.25" Plate	74.08 - 74.33	1.0000	1.0000
L14	36	MP3-03	74.08 - 74.33	1.0000	1.0000
L14	37	MP3-03	74.08 - 74.33	1.0000	1.0000
L14	38	MP3-03	74.08 - 74.33	1.0000	1.0000
L15	2	HB158-1-08U8-S8J18(1-5/8)	69.08 - 74.08	1.0000	1.0000
L15	7	ATCB-B01(5/16)	69.08 - 74.08	1.0000	1.0000
L15	8	FXL 780 PE(7/8)	69.08 - 74.08	1.0000	1.0000
L15	12	Safety Line 3/8	69.08 - 74.08	1.0000	1.0000
L15	23	4.0" x 1.25" Plate	69.08 - 74.08	1.0000	1.0000
L15	24	4.0" x 1.25" Plate	69.08 - 74.08	1.0000	1.0000
L15	25	4.0" x 1.25" Plate	69.08 - 74.08	1.0000	1.0000
L15	36	MP3-03	69.08 - 74.08	1.0000	1.0000
L15	37	MP3-03	69.08 - 74.08	1.0000	1.0000
L15	38	MP3-03	69.08 - 74.08	1.0000	1.0000
L16	2	HB158-1-08U8-S8J18(1-5/8)	64.08 - 69.08	1.0000	1.0000
L16	7	ATCB-B01(5/16)	64.08 - 69.08	1.0000	1.0000
L16	8	FXL 780 PE(7/8)	64.08 - 69.08	1.0000	1.0000
L16	12	Safety Line 3/8	64.08 - 69.08	1.0000	1.0000
L16	23	4.0" x 1.25" Plate	64.08 - 69.08	1.0000	1.0000
L16	24	4.0" x 1.25" Plate	64.08 - 69.08	1.0000	1.0000
L16	25	4.0" x 1.25" Plate	64.08 - 69.08	1.0000	1.0000
L16	36	MP3-03	64.08 - 69.08	1.0000	1.0000
L16	37	MP3-03	64.08 - 69.08	1.0000	1.0000
L16	38	MP3-03	64.08 - 69.08	1.0000	1.0000
L17	2	HB158-1-08U8-S8J18(1-5/8)	59.08 - 64.08	1.0000	1.0000
L17	7	ATCB-B01(5/16)	59.08 - 64.08	1.0000	1.0000
L17	8	FXL 780 PE(7/8)	59.08 - 64.08	1.0000	1.0000
L17	12	Safety Line 3/8	59.08 - 64.08	1.0000	1.0000
L17	19	4.375" x 1.25" Plate	59.08 - 59.50	1.0000	1.0000
L17	20	4.375" x 1.25" Plate	59.08 - 59.50	1.0000	1.0000
L17	21	4.375" x 1.25" Plate	59.08 - 59.50	1.0000	1.0000
L17	23	4.0" x 1.25" Plate	59.50 - 64.08	1.0000	1.0000
L17	24	4.0" x 1.25" Plate	59.50 - 64.08	1.0000	1.0000
L17	25	4.0" x 1.25" Plate	59.50 - 64.08	1.0000	1.0000
L17	32	MP3-05	59.08 - 60.50	1.0000	1.0000
L17	33	MP3-05	59.08 - 60.50	1.0000	1.0000
L17	34	MP3-05	59.08 - 60.50	1.0000	1.0000
L17	36	MP3-03	60.50 - 64.08	1.0000	1.0000
L17	37	MP3-03	60.50 - 64.08	1.0000	1.0000
L17	38	MP3-03	60.50 - 64.08	1.0000	1.0000
L18	2	HB158-1-08U8-S8J18(1-5/8)	58.08 - 59.08	1.0000	1.0000
L18	7	ATCB-B01(5/16)	58.08 - 59.08	1.0000	1.0000
L18	8	FXL 780 PE(7/8)	58.08 - 59.08	1.0000	1.0000
L18	12	Safety Line 3/8	58.08 - 59.08	1.0000	1.0000
L18	19	4.375" x 1.25" Plate	58.08 - 59.08	1.0000	1.0000
L18	20	4.375" x 1.25" Plate	58.08 - 59.08	1.0000	1.0000
L18	21	4.375" x 1.25" Plate	58.08 - 59.08	1.0000	1.0000
L18	32	MP3-05	58.08 - 59.08	1.0000	1.0000
L18	33	MP3-05	58.08 - 59.08	1.0000	1.0000
L18	34	MP3-05	58.08 - 59.08	1.0000	1.0000
L19	2	HB158-1-08U8-S8J18(1-5/8)	57.73 - 58.08	1.0000	1.0000
L19	7	ATCB-B01(5/16)	57.73 - 58.08	1.0000	1.0000
L19	8	FXL 780 PE(7/8)	57.73 - 58.08	1.0000	1.0000
L19	12	Safety Line 3/8	57.73 - 58.08	1.0000	1.0000
L19	19	4.375" x 1.25" Plate	57.73 - 58.08	1.0000	1.0000
L19	20	4.375" x 1.25" Plate	57.73 - 58.08	1.0000	1.0000
L19	21	4.375" x 1.25" Plate	57.73 - 58.08	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	32	MP3-05	57.73 - 58.08	1.0000	1.0000
L19	33	MP3-05	57.73 - 58.08	1.0000	1.0000
L19	34	MP3-05	57.73 - 58.08	1.0000	1.0000
L20	2	HB158-1-08U8-S8J18(1-5/8)	57.50 - 57.73	1.0000	1.0000
L20	7	ATCB-B01(5/16)	57.50 - 57.73	1.0000	1.0000
L20	8	FXL 780 PE(7/8)	57.50 - 57.73	1.0000	1.0000
L20	12	Safety Line 3/8	57.50 - 57.73	1.0000	1.0000
L20	19	4.375" x 1.25" Plate	57.50 - 57.73	1.0000	1.0000
L20	20	4.375" x 1.25" Plate	57.50 - 57.73	1.0000	1.0000
L20	21	4.375" x 1.25" Plate	57.50 - 57.73	1.0000	1.0000
L20	32	MP3-05	57.50 - 57.73	1.0000	1.0000
L20	33	MP3-05	57.50 - 57.73	1.0000	1.0000
L20	34	MP3-05	57.50 - 57.73	1.0000	1.0000
L21	2	HB158-1-08U8-S8J18(1-5/8)	52.50 - 57.50	1.0000	1.0000
L21	7	ATCB-B01(5/16)	52.50 - 57.50	1.0000	1.0000
L21	8	FXL 780 PE(7/8)	52.50 - 57.50	1.0000	1.0000
L21	12	Safety Line 3/8	52.50 - 57.50	1.0000	1.0000
L21	19	4.375" x 1.25" Plate	52.50 - 57.50	1.0000	1.0000
L21	20	4.375" x 1.25" Plate	52.50 - 57.50	1.0000	1.0000
L21	21	4.375" x 1.25" Plate	52.50 - 57.50	1.0000	1.0000
L21	32	MP3-05	52.50 - 57.50	1.0000	1.0000
L21	33	MP3-05	52.50 - 57.50	1.0000	1.0000
L21	34	MP3-05	52.50 - 57.50	1.0000	1.0000
L22	2	HB158-1-08U8-S8J18(1-5/8)	47.00 - 52.50	1.0000	1.0000
L22	7	ATCB-B01(5/16)	47.00 - 52.50	1.0000	1.0000
L22	8	FXL 780 PE(7/8)	47.00 - 52.50	1.0000	1.0000
L22	12	Safety Line 3/8	47.00 - 52.50	1.0000	1.0000
L22	19	4.375" x 1.25" Plate	47.00 - 52.50	1.0000	1.0000
L22	20	4.375" x 1.25" Plate	47.00 - 52.50	1.0000	1.0000
L22	21	4.375" x 1.25" Plate	47.00 - 52.50	1.0000	1.0000
L22	32	MP3-05	47.00 - 52.50	1.0000	1.0000
L22	33	MP3-05	47.00 - 52.50	1.0000	1.0000
L22	34	MP3-05	47.00 - 52.50	1.0000	1.0000
L23	2	HB158-1-08U8-S8J18(1-5/8)	45.25 - 47.00	1.0000	1.0000
L23	7	ATCB-B01(5/16)	45.25 - 47.00	1.0000	1.0000
L23	8	FXL 780 PE(7/8)	45.25 - 47.00	1.0000	1.0000
L23	12	Safety Line 3/8	45.25 - 47.00	1.0000	1.0000
L23	19	4.375" x 1.25" Plate	45.25 - 47.00	1.0000	1.0000
L23	20	4.375" x 1.25" Plate	45.25 - 47.00	1.0000	1.0000
L23	21	4.375" x 1.25" Plate	45.25 - 47.00	1.0000	1.0000
L23	32	MP3-05	45.25 - 47.00	1.0000	1.0000
L23	33	MP3-05	45.25 - 47.00	1.0000	1.0000
L23	34	MP3-05	45.25 - 47.00	1.0000	1.0000
L24	2	HB158-1-08U8-S8J18(1-5/8)	40.25 - 45.25	1.0000	1.0000
L24	7	ATCB-B01(5/16)	40.25 - 45.25	1.0000	1.0000
L24	8	FXL 780 PE(7/8)	40.25 - 45.25	1.0000	1.0000
L24	12	Safety Line 3/8	40.25 - 45.25	1.0000	1.0000
L24	19	4.375" x 1.25" Plate	40.25 - 45.25	1.0000	1.0000
L24	20	4.375" x 1.25" Plate	40.25 - 45.25	1.0000	1.0000
L24	21	4.375" x 1.25" Plate	40.25 - 45.25	1.0000	1.0000
L24	27	MP3-05	40.25 - 40.50	1.0000	1.0000
L24	29	MP3-05	40.25 - 40.50	1.0000	1.0000
L24	30	MP3-05	40.25 - 40.50	1.0000	1.0000
L24	32	MP3-05	40.50 - 45.25	1.0000	1.0000
L24	33	MP3-05	40.50 - 45.25	1.0000	1.0000
L24	34	MP3-05	40.50 - 45.25	1.0000	1.0000
L25	2	HB158-1-08U8-S8J18(1-5/8)	38.08 - 40.25	1.0000	1.0000
L25	7	ATCB-B01(5/16)	38.08 - 40.25	1.0000	1.0000
L25	8	FXL 780 PE(7/8)	38.08 - 40.25	1.0000	1.0000
L25	12	Safety Line 3/8	38.08 - 40.25	1.0000	1.0000
L25	19	4.375" x 1.25" Plate	38.08 - 40.25	1.0000	1.0000
L25	20	4.375" x 1.25" Plate	38.08 - 40.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L25	21	4.375" x 1.25" Plate	38.08 - 40.25	1.0000	1.0000
L25	27	MP3-05	38.08 - 40.25	1.0000	1.0000
L25	29	MP3-05	38.08 - 40.25	1.0000	1.0000
L25	30	MP3-05	38.08 - 40.25	1.0000	1.0000
L26	2	HB158-1-08U8-S8J18(1-5/8)	37.83 - 38.08	1.0000	1.0000
L26	7	ATCB-B01(5/16)	37.83 - 38.08	1.0000	1.0000
L26	8	FXL 780 PE(7/8)	37.83 - 38.08	1.0000	1.0000
L26	12	Safety Line 3/8	37.83 - 38.08	1.0000	1.0000
L26	19	4.375" x 1.25" Plate	37.83 - 38.08	1.0000	1.0000
L26	20	4.375" x 1.25" Plate	37.83 - 38.08	1.0000	1.0000
L26	21	4.375" x 1.25" Plate	37.83 - 38.08	1.0000	1.0000
L26	27	MP3-05	37.83 - 38.08	1.0000	1.0000
L26	29	MP3-05	37.83 - 38.08	1.0000	1.0000
L26	30	MP3-05	37.83 - 38.08	1.0000	1.0000
L27	2	HB158-1-08U8-S8J18(1-5/8)	32.83 - 37.83	1.0000	1.0000
L27	7	ATCB-B01(5/16)	32.83 - 37.83	1.0000	1.0000
L27	8	FXL 780 PE(7/8)	32.83 - 37.83	1.0000	1.0000
L27	12	Safety Line 3/8	32.83 - 37.83	1.0000	1.0000
L27	19	4.375" x 1.25" Plate	32.83 - 37.83	1.0000	1.0000
L27	20	4.375" x 1.25" Plate	32.83 - 37.83	1.0000	1.0000
L27	21	4.375" x 1.25" Plate	32.83 - 37.83	1.0000	1.0000
L27	27	MP3-05	32.83 - 37.83	1.0000	1.0000
L27	29	MP3-05	32.83 - 37.83	1.0000	1.0000
L27	30	MP3-05	32.83 - 37.83	1.0000	1.0000
L28	2	HB158-1-08U8-S8J18(1-5/8)	27.73 - 32.83	1.0000	1.0000
L28	7	ATCB-B01(5/16)	27.73 - 32.83	1.0000	1.0000
L28	8	FXL 780 PE(7/8)	27.73 - 32.83	1.0000	1.0000
L28	12	Safety Line 3/8	27.73 - 32.83	1.0000	1.0000
L28	14	5.25" x 1.25" Plate	27.73 - 29.75	1.0000	1.0000
L28	16	5.25" x 1.25" Plate	27.73 - 29.75	1.0000	1.0000
L28	17	5.25" x 1.25" Plate	27.73 - 29.75	1.0000	1.0000
L28	19	4.375" x 1.25" Plate	29.75 - 32.83	1.0000	1.0000
L28	20	4.375" x 1.25" Plate	29.75 - 32.83	1.0000	1.0000
L28	21	4.375" x 1.25" Plate	29.75 - 32.83	1.0000	1.0000
L28	27	MP3-05	27.73 - 32.83	1.0000	1.0000
L28	29	MP3-05	27.73 - 32.83	1.0000	1.0000
L28	30	MP3-05	27.73 - 32.83	1.0000	1.0000
L29	2	HB158-1-08U8-S8J18(1-5/8)	27.50 - 27.73	1.0000	1.0000
L29	7	ATCB-B01(5/16)	27.50 - 27.73	1.0000	1.0000
L29	8	FXL 780 PE(7/8)	27.50 - 27.73	1.0000	1.0000
L29	12	Safety Line 3/8	27.50 - 27.73	1.0000	1.0000
L29	14	5.25" x 1.25" Plate	27.50 - 27.73	1.0000	1.0000
L29	16	5.25" x 1.25" Plate	27.50 - 27.73	1.0000	1.0000
L29	17	5.25" x 1.25" Plate	27.50 - 27.73	1.0000	1.0000
L29	27	MP3-05	27.50 - 27.73	1.0000	1.0000
L29	29	MP3-05	27.50 - 27.73	1.0000	1.0000
L29	30	MP3-05	27.50 - 27.73	1.0000	1.0000
L30	2	HB158-1-08U8-S8J18(1-5/8)	22.50 - 27.50	1.0000	1.0000
L30	7	ATCB-B01(5/16)	22.50 - 27.50	1.0000	1.0000
L30	8	FXL 780 PE(7/8)	22.50 - 27.50	1.0000	1.0000
L30	12	Safety Line 3/8	22.50 - 27.50	1.0000	1.0000
L30	14	5.25" x 1.25" Plate	22.50 - 27.50	1.0000	1.0000
L30	16	5.25" x 1.25" Plate	22.50 - 27.50	1.0000	1.0000
L30	17	5.25" x 1.25" Plate	22.50 - 27.50	1.0000	1.0000
L30	27	MP3-05	22.50 - 27.50	1.0000	1.0000
L30	29	MP3-05	22.50 - 27.50	1.0000	1.0000
L30	30	MP3-05	22.50 - 27.50	1.0000	1.0000
L31	2	HB158-1-08U8-S8J18(1-5/8)	19.50 - 22.50	1.0000	1.0000
L31	7	ATCB-B01(5/16)	19.50 - 22.50	1.0000	1.0000
L31	8	FXL 780 PE(7/8)	19.50 - 22.50	1.0000	1.0000
L31	12	Safety Line 3/8	19.50 - 22.50	1.0000	1.0000
L31	14	5.25" x 1.25" Plate	19.50 - 22.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L31	16	5.25" x 1.25" Plate	19.50 - 22.50	1.0000	1.0000
L31	17	5.25" x 1.25" Plate	19.50 - 22.50	1.0000	1.0000
L31	27	MP3-05	19.50 - 22.50	1.0000	1.0000
L31	29	MP3-05	19.50 - 22.50	1.0000	1.0000
L31	30	MP3-05	19.50 - 22.50	1.0000	1.0000
L31	41	CCI 4.5" x 1" Plate	19.50 - 21.00	1.0000	1.0000
L32	2	HB158-1-08U8-S8J18(1-5/8)	19.25 - 19.50	1.0000	1.0000
L32	7	ATCB-B01(5/16)	19.25 - 19.50	1.0000	1.0000
L32	8	FXL 780 PE(7/8)	19.25 - 19.50	1.0000	1.0000
L32	12	Safety Line 3/8	19.25 - 19.50	1.0000	1.0000
L32	14	5.25" x 1.25" Plate	19.25 - 19.50	1.0000	1.0000
L32	16	5.25" x 1.25" Plate	19.25 - 19.50	1.0000	1.0000
L32	17	5.25" x 1.25" Plate	19.25 - 19.50	1.0000	1.0000
L32	27	MP3-05	19.25 - 19.50	1.0000	1.0000
L32	29	MP3-05	19.25 - 19.50	1.0000	1.0000
L32	30	MP3-05	19.25 - 19.50	1.0000	1.0000
L32	41	CCI 4.5" x 1" Plate	19.25 - 19.50	1.0000	1.0000
L33	2	HB158-1-08U8-S8J18(1-5/8)	14.25 - 19.25	1.0000	1.0000
L33	7	ATCB-B01(5/16)	14.25 - 19.25	1.0000	1.0000
L33	8	FXL 780 PE(7/8)	14.25 - 19.25	1.0000	1.0000
L33	12	Safety Line 3/8	14.25 - 19.25	1.0000	1.0000
L33	14	5.25" x 1.25" Plate	14.25 - 19.25	1.0000	1.0000
L33	15	5.25" x 1.25" Plate	14.25 - 15.50	1.0000	1.0000
L33	16	5.25" x 1.25" Plate	14.25 - 19.25	1.0000	1.0000
L33	17	5.25" x 1.25" Plate	14.25 - 19.25	1.0000	1.0000
L33	27	MP3-05	14.25 - 19.25	1.0000	1.0000
L33	28	MP3-05	14.25 - 15.50	1.0000	1.0000
L33	29	MP3-05	14.25 - 19.25	1.0000	1.0000
L33	30	MP3-05	14.25 - 19.25	1.0000	1.0000
L33	40	CCI 4.5" x 1" Plate	14.25 - 15.50	1.0000	1.0000
L33	41	CCI 4.5" x 1" Plate	14.25 - 19.25	1.0000	1.0000
L34	2	HB158-1-08U8-S8J18(1-5/8)	14.00 - 14.25	1.0000	1.0000
L34	7	ATCB-B01(5/16)	14.00 - 14.25	1.0000	1.0000
L34	8	FXL 780 PE(7/8)	14.00 - 14.25	1.0000	1.0000
L34	12	Safety Line 3/8	14.00 - 14.25	1.0000	1.0000
L34	14	5.25" x 1.25" Plate	14.00 - 14.25	1.0000	1.0000
L34	15	5.25" x 1.25" Plate	14.00 - 14.25	1.0000	1.0000
L34	16	5.25" x 1.25" Plate	14.00 - 14.25	1.0000	1.0000
L34	17	5.25" x 1.25" Plate	14.00 - 14.25	1.0000	1.0000
L34	27	MP3-05	14.00 - 14.25	1.0000	1.0000
L34	28	MP3-05	14.00 - 14.25	1.0000	1.0000
L34	29	MP3-05	14.00 - 14.25	1.0000	1.0000
L34	30	MP3-05	14.00 - 14.25	1.0000	1.0000
L34	40	CCI 4.5" x 1" Plate	14.00 - 14.25	1.0000	1.0000
L34	41	CCI 4.5" x 1" Plate	14.00 - 14.25	1.0000	1.0000
L35	2	HB158-1-08U8-S8J18(1-5/8)	13.75 - 14.00	1.0000	1.0000
L35	7	ATCB-B01(5/16)	13.75 - 14.00	1.0000	1.0000
L35	8	FXL 780 PE(7/8)	13.75 - 14.00	1.0000	1.0000
L35	12	Safety Line 3/8	13.75 - 14.00	1.0000	1.0000
L35	14	5.25" x 1.25" Plate	13.75 - 14.00	1.0000	1.0000
L35	15	5.25" x 1.25" Plate	13.75 - 14.00	1.0000	1.0000
L35	16	5.25" x 1.25" Plate	13.75 - 14.00	1.0000	1.0000
L35	17	5.25" x 1.25" Plate	13.75 - 14.00	1.0000	1.0000
L35	27	MP3-05	13.75 - 14.00	1.0000	1.0000
L35	28	MP3-05	13.75 - 14.00	1.0000	1.0000
L35	29	MP3-05	13.75 - 14.00	1.0000	1.0000
L35	30	MP3-05	13.75 - 14.00	1.0000	1.0000
L35	40	CCI 4.5" x 1" Plate	13.75 - 14.00	1.0000	1.0000
L35	41	CCI 4.5" x 1" Plate	13.75 - 14.00	1.0000	1.0000
L36	2	HB158-1-08U8-S8J18(1-5/8)	12.98 - 13.75	1.0000	1.0000
L36	7	ATCB-B01(5/16)	12.98 - 13.75	1.0000	1.0000
L36	8	FXL 780 PE(7/8)	12.98 - 13.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L36	12	Safety Line 3/8	12.98 - 13.75	1.0000	1.0000
L36	14	5.25" x 1.25" Plate	12.98 - 13.75	1.0000	1.0000
L36	15	5.25" x 1.25" Plate	12.98 - 13.75	1.0000	1.0000
L36	16	5.25" x 1.25" Plate	12.98 - 13.75	1.0000	1.0000
L36	17	5.25" x 1.25" Plate	12.98 - 13.75	1.0000	1.0000
L36	27	MP3-05	12.98 - 13.75	1.0000	1.0000
L36	28	MP3-05	12.98 - 13.75	1.0000	1.0000
L36	29	MP3-05	12.98 - 13.75	1.0000	1.0000
L36	30	MP3-05	12.98 - 13.75	1.0000	1.0000
L36	40	CCI 4.5" x 1" Plate	12.98 - 13.75	1.0000	1.0000
L36	41	CCI 4.5" x 1" Plate	12.98 - 13.75	1.0000	1.0000
L37	2	HB158-1-08U8-S8J18(1-5/8)	12.82 - 12.98	1.0000	1.0000
L37	7	ATCB-B01(5/16)	12.82 - 12.98	1.0000	1.0000
L37	8	FXL 780 PE(7/8)	12.82 - 12.98	1.0000	1.0000
L37	12	Safety Line 3/8	12.82 - 12.98	1.0000	1.0000
L37	14	5.25" x 1.25" Plate	12.82 - 12.98	1.0000	1.0000
L37	15	5.25" x 1.25" Plate	12.82 - 12.98	1.0000	1.0000
L37	16	5.25" x 1.25" Plate	12.82 - 12.98	1.0000	1.0000
L37	17	5.25" x 1.25" Plate	12.82 - 12.98	1.0000	1.0000
L37	27	MP3-05	12.82 - 12.98	1.0000	1.0000
L37	28	MP3-05	12.82 - 12.98	1.0000	1.0000
L37	29	MP3-05	12.82 - 12.98	1.0000	1.0000
L37	30	MP3-05	12.82 - 12.98	1.0000	1.0000
L37	40	CCI 4.5" x 1" Plate	12.82 - 12.98	1.0000	1.0000
L37	41	CCI 4.5" x 1" Plate	12.82 - 12.98	1.0000	1.0000
L38	2	HB158-1-08U8-S8J18(1-5/8)	12.65 - 12.82	1.0000	1.0000
L38	7	ATCB-B01(5/16)	12.65 - 12.82	1.0000	1.0000
L38	8	FXL 780 PE(7/8)	12.65 - 12.82	1.0000	1.0000
L38	12	Safety Line 3/8	12.65 - 12.82	1.0000	1.0000
L38	14	5.25" x 1.25" Plate	12.65 - 12.82	1.0000	1.0000
L38	15	5.25" x 1.25" Plate	12.65 - 12.82	1.0000	1.0000
L38	16	5.25" x 1.25" Plate	12.65 - 12.82	1.0000	1.0000
L38	17	5.25" x 1.25" Plate	12.65 - 12.82	1.0000	1.0000
L38	27	MP3-05	12.65 - 12.82	1.0000	1.0000
L38	28	MP3-05	12.65 - 12.82	1.0000	1.0000
L38	29	MP3-05	12.65 - 12.82	1.0000	1.0000
L38	30	MP3-05	12.65 - 12.82	1.0000	1.0000
L38	40	CCI 4.5" x 1" Plate	12.65 - 12.82	1.0000	1.0000
L38	41	CCI 4.5" x 1" Plate	12.65 - 12.82	1.0000	1.0000
L39	2	HB158-1-08U8-S8J18(1-5/8)	12.50 - 12.65	1.0000	1.0000
L39	7	ATCB-B01(5/16)	12.50 - 12.65	1.0000	1.0000
L39	8	FXL 780 PE(7/8)	12.50 - 12.65	1.0000	1.0000
L39	12	Safety Line 3/8	12.50 - 12.65	1.0000	1.0000
L39	14	5.25" x 1.25" Plate	12.50 - 12.65	1.0000	1.0000
L39	15	5.25" x 1.25" Plate	12.50 - 12.65	1.0000	1.0000
L39	16	5.25" x 1.25" Plate	12.50 - 12.65	1.0000	1.0000
L39	17	5.25" x 1.25" Plate	12.50 - 12.65	1.0000	1.0000
L39	27	MP3-05	12.50 - 12.65	1.0000	1.0000
L39	28	MP3-05	12.50 - 12.65	1.0000	1.0000
L39	29	MP3-05	12.50 - 12.65	1.0000	1.0000
L39	30	MP3-05	12.50 - 12.65	1.0000	1.0000
L39	40	CCI 4.5" x 1" Plate	12.50 - 12.65	1.0000	1.0000
L39	41	CCI 4.5" x 1" Plate	12.50 - 12.65	1.0000	1.0000
L40	2	HB158-1-08U8-S8J18(1-5/8)	12.25 - 12.50	1.0000	1.0000
L40	7	ATCB-B01(5/16)	12.25 - 12.50	1.0000	1.0000
L40	8	FXL 780 PE(7/8)	12.25 - 12.50	1.0000	1.0000
L40	12	Safety Line 3/8	12.25 - 12.50	1.0000	1.0000
L40	14	5.25" x 1.25" Plate	12.25 - 12.50	1.0000	1.0000
L40	15	5.25" x 1.25" Plate	12.25 - 12.50	1.0000	1.0000
L40	16	5.25" x 1.25" Plate	12.25 - 12.50	1.0000	1.0000
L40	17	5.25" x 1.25" Plate	12.25 - 12.50	1.0000	1.0000
L40	27	MP3-05	12.25 - 12.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	28	MP3-05	12.25 - 12.50	1.0000	1.0000
L40	29	MP3-05	12.25 - 12.50	1.0000	1.0000
L40	30	MP3-05	12.25 - 12.50	1.0000	1.0000
L40	40	CCI 4.5" x 1" Plate	12.25 - 12.50	1.0000	1.0000
L40	41	CCI 4.5" x 1" Plate	12.25 - 12.50	1.0000	1.0000
L41	2	HB158-1-08U8-S8J18(1-5/8)	7.25 - 12.25	1.0000	1.0000
L41	7	ATCB-B01(5/16)	7.25 - 12.25	1.0000	1.0000
L41	8	FXL 780 PE(7/8)	7.25 - 12.25	1.0000	1.0000
L41	12	Safety Line 3/8	7.25 - 12.25	1.0000	1.0000
L41	14	5.25" x 1.25" Plate	7.25 - 12.25	1.0000	1.0000
L41	15	5.25" x 1.25" Plate	7.25 - 12.25	1.0000	1.0000
L41	16	5.25" x 1.25" Plate	10.25 - 12.25	1.0000	1.0000
L41	17	5.25" x 1.25" Plate	7.25 - 12.25	1.0000	1.0000
L41	27	MP3-05	7.25 - 12.25	1.0000	1.0000
L41	28	MP3-05	7.25 - 12.25	1.0000	1.0000
L41	29	MP3-05	10.50 - 12.25	1.0000	1.0000
L41	30	MP3-05	7.25 - 12.25	1.0000	1.0000
L41	40	CCI 4.5" x 1" Plate	7.25 - 12.25	1.0000	1.0000
L41	41	CCI 4.5" x 1" Plate	11.00 - 12.25	1.0000	1.0000
L42	2	HB158-1-08U8-S8J18(1-5/8)	2.25 - 7.25	1.0000	1.0000
L42	7	ATCB-B01(5/16)	2.25 - 7.25	1.0000	1.0000
L42	8	FXL 780 PE(7/8)	2.25 - 7.25	1.0000	1.0000
L42	12	Safety Line 3/8	2.25 - 7.25	1.0000	1.0000
L42	14	5.25" x 1.25" Plate	2.25 - 7.25	1.0000	1.0000
L42	15	5.25" x 1.25" Plate	2.25 - 7.25	1.0000	1.0000
L42	17	5.25" x 1.25" Plate	2.25 - 7.25	1.0000	1.0000
L42	27	MP3-05	2.25 - 7.25	1.0000	1.0000
L42	28	MP3-05	2.25 - 7.25	1.0000	1.0000
L42	30	MP3-05	2.25 - 7.25	1.0000	1.0000
L42	40	CCI 4.5" x 1" Plate	2.25 - 7.25	1.0000	1.0000
L43	2	HB158-1-08U8-S8J18(1-5/8)	0.00 - 2.25	1.0000	1.0000
L43	7	ATCB-B01(5/16)	0.00 - 2.25	1.0000	1.0000
L43	8	FXL 780 PE(7/8)	0.00 - 2.25	1.0000	1.0000
L43	12	Safety Line 3/8	0.00 - 2.25	1.0000	1.0000
L43	14	5.25" x 1.25" Plate	0.00 - 2.25	1.0000	1.0000
L43	15	5.25" x 1.25" Plate	0.00 - 2.25	1.0000	1.0000
L43	17	5.25" x 1.25" Plate	0.00 - 2.25	1.0000	1.0000
L43	27	MP3-05	0.00 - 2.25	1.0000	1.0000
L43	28	MP3-05	0.00 - 2.25	1.0000	1.0000
L43	30	MP3-05	0.00 - 2.25	1.0000	1.0000
L43	40	CCI 4.5" x 1" Plate	0.00 - 2.25	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
L6	36	MP3-03	83.00 - 84.05	Auto	0.2656
L6	37	MP3-03	83.00 - 84.05	Auto	0.2656
L6	38	MP3-03	83.00 - 84.05	Auto	0.2656
L7	36	MP3-03	82.87 - 83.00	Auto	0.2615
L7	37	MP3-03	82.87 - 83.00	Auto	0.2615
L7	38	MP3-03	82.87 - 83.00	Auto	0.2615
L8	36	MP3-03	82.62 - 82.87	Auto	0.3360
L8	37	MP3-03	82.62 - 82.87	Auto	0.3360
L8	38	MP3-03	82.62 - 82.87	Auto	0.3360
L9	23	4.0" x 1.25" Plate	77.62 - 78.00	Auto	0.2886
L9	24	4.0" x 1.25" Plate	77.62 - 78.00	Auto	0.2886
L9	25	4.0" x 1.25" Plate	77.62 - 78.00	Auto	0.2886

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L9	36	MP3-03	77.62 - 82.62	Auto	0.3151
L9	37	MP3-03	77.62 - 82.62	Auto	0.3151
L9	38	MP3-03	77.62 - 82.62	Auto	0.3151
L10	23	4.0" x 1.25" Plate	76.25 - 77.62	Auto	0.2824
L10	24	4.0" x 1.25" Plate	76.25 - 77.62	Auto	0.2824
L10	25	4.0" x 1.25" Plate	76.25 - 77.62	Auto	0.2824
L10	36	MP3-03	76.25 - 77.62	Auto	0.2930
L10	37	MP3-03	76.25 - 77.62	Auto	0.2930
L10	38	MP3-03	76.25 - 77.62	Auto	0.2930
L11	23	4.0" x 1.25" Plate	76.00 - 76.25	Auto	0.3839
L11	24	4.0" x 1.25" Plate	76.00 - 76.25	Auto	0.3839
L11	25	4.0" x 1.25" Plate	76.00 - 76.25	Auto	0.3839
L11	36	MP3-03	76.00 - 76.25	Auto	0.3930
L11	37	MP3-03	76.00 - 76.25	Auto	0.3930
L11	38	MP3-03	76.00 - 76.25	Auto	0.3930
L12	23	4.0" x 1.25" Plate	75.75 - 76.00	Auto	0.3189
L12	24	4.0" x 1.25" Plate	75.75 - 76.00	Auto	0.3189
L12	25	4.0" x 1.25" Plate	75.75 - 76.00	Auto	0.3189
L12	36	MP3-03	75.75 - 76.00	Auto	0.3290
L12	37	MP3-03	75.75 - 76.00	Auto	0.3290
L12	38	MP3-03	75.75 - 76.00	Auto	0.3290
L13	23	4.0" x 1.25" Plate	74.33 - 75.75	Auto	0.3103
L13	24	4.0" x 1.25" Plate	74.33 - 75.75	Auto	0.3103
L13	25	4.0" x 1.25" Plate	74.33 - 75.75	Auto	0.3103
L13	36	MP3-03	74.33 - 75.75	Auto	0.3205
L13	37	MP3-03	74.33 - 75.75	Auto	0.3205
L13	38	MP3-03	74.33 - 75.75	Auto	0.3205
L14	23	4.0" x 1.25" Plate	74.08 - 74.33	Auto	0.3649
L14	24	4.0" x 1.25" Plate	74.08 - 74.33	Auto	0.3649
L14	25	4.0" x 1.25" Plate	74.08 - 74.33	Auto	0.3649
L14	36	MP3-03	74.08 - 74.33	Auto	0.3743
L14	37	MP3-03	74.08 - 74.33	Auto	0.3743
L14	38	MP3-03	74.08 - 74.33	Auto	0.3743
L15	23	4.0" x 1.25" Plate	69.08 - 74.08	Auto	0.3410
L15	24	4.0" x 1.25" Plate	69.08 - 74.08	Auto	0.3410
L15	25	4.0" x 1.25" Plate	69.08 - 74.08	Auto	0.3410
L15	36	MP3-03	69.08 - 74.08	Auto	0.3507
L15	37	MP3-03	69.08 - 74.08	Auto	0.3507
L15	38	MP3-03	69.08 - 74.08	Auto	0.3507
L16	23	4.0" x 1.25" Plate	64.08 - 69.08	Auto	0.2947
L16	24	4.0" x 1.25" Plate	64.08 - 69.08	Auto	0.2947
L16	25	4.0" x 1.25" Plate	64.08 - 69.08	Auto	0.2947
L16	36	MP3-03	64.08 - 69.08	Auto	0.3052
L16	37	MP3-03	64.08 - 69.08	Auto	0.3052
L16	38	MP3-03	64.08 - 69.08	Auto	0.3052
L17	19	4.375" x 1.25" Plate	59.08 - 59.50	Auto	0.3032
L17	20	4.375" x 1.25" Plate	59.08 - 59.50	Auto	0.3032
L17	21	4.375" x 1.25" Plate	59.08 - 59.50	Auto	0.3032
L17	23	4.0" x 1.25" Plate	59.50 - 64.08	Auto	0.2555
L17	24	4.0" x 1.25" Plate	59.50 - 64.08	Auto	0.2555
L17	25	4.0" x 1.25" Plate	59.50 - 64.08	Auto	0.2555
L17	32	MP3-05	59.08 - 60.50	Auto	0.4307
L17	33	MP3-05	59.08 - 60.50	Auto	0.4307
L17	34	MP3-05	59.08 - 60.50	Auto	0.4307
L17	36	MP3-03	60.50 - 64.08	Auto	0.2700
L17	37	MP3-03	60.50 - 64.08	Auto	0.2700
L17	38	MP3-03	60.50 - 64.08	Auto	0.2700
L18	19	4.375" x 1.25" Plate	58.08 - 59.08	Auto	0.2987
L18	20	4.375" x 1.25" Plate	58.08 - 59.08	Auto	0.2987
L18	21	4.375" x 1.25" Plate	58.08 - 59.08	Auto	0.2987
L18	32	MP3-05	58.08 - 59.08	Auto	0.4243

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L18	33	MP3-05	58.08 - 59.08	Auto	0.4243
L18	34	MP3-05	58.08 - 59.08	Auto	0.4243
L19	19	4.375" x 1.25" Plate	57.73 - 58.08	Auto	0.3195
L19	20	4.375" x 1.25" Plate	57.73 - 58.08	Auto	0.3195
L19	21	4.375" x 1.25" Plate	57.73 - 58.08	Auto	0.3195
L19	32	MP3-05	57.73 - 58.08	Auto	0.4414
L19	33	MP3-05	57.73 - 58.08	Auto	0.4414
L19	34	MP3-05	57.73 - 58.08	Auto	0.4414
L20	19	4.375" x 1.25" Plate	57.50 - 57.73	Auto	0.3176
L20	20	4.375" x 1.25" Plate	57.50 - 57.73	Auto	0.3176
L20	21	4.375" x 1.25" Plate	57.50 - 57.73	Auto	0.3176
L20	32	MP3-05	57.50 - 57.73	Auto	0.4398
L20	33	MP3-05	57.50 - 57.73	Auto	0.4398
L20	34	MP3-05	57.50 - 57.73	Auto	0.4398
L21	19	4.375" x 1.25" Plate	52.50 - 57.50	Auto	0.2907
L21	20	4.375" x 1.25" Plate	52.50 - 57.50	Auto	0.2907
L21	21	4.375" x 1.25" Plate	52.50 - 57.50	Auto	0.2907
L21	32	MP3-05	52.50 - 57.50	Auto	0.4178
L21	33	MP3-05	52.50 - 57.50	Auto	0.4178
L21	34	MP3-05	52.50 - 57.50	Auto	0.4178
L22	19	4.375" x 1.25" Plate	47.00 - 52.50	Auto	0.2569
L22	20	4.375" x 1.25" Plate	47.00 - 52.50	Auto	0.2569
L22	21	4.375" x 1.25" Plate	47.00 - 52.50	Auto	0.2569
L22	32	MP3-05	47.00 - 52.50	Auto	0.3900
L22	33	MP3-05	47.00 - 52.50	Auto	0.3900
L22	34	MP3-05	47.00 - 52.50	Auto	0.3900
L23	19	4.375" x 1.25" Plate	45.25 - 47.00	Auto	0.2687
L23	20	4.375" x 1.25" Plate	45.25 - 47.00	Auto	0.2687
L23	21	4.375" x 1.25" Plate	45.25 - 47.00	Auto	0.2687
L23	32	MP3-05	45.25 - 47.00	Auto	0.3998
L23	33	MP3-05	45.25 - 47.00	Auto	0.3998
L23	34	MP3-05	45.25 - 47.00	Auto	0.3998
L24	19	4.375" x 1.25" Plate	40.25 - 45.25	Auto	0.2420
L24	20	4.375" x 1.25" Plate	40.25 - 45.25	Auto	0.2420
L24	21	4.375" x 1.25" Plate	40.25 - 45.25	Auto	0.2420
L24	27	MP3-05	40.25 - 40.50	Auto	0.3652
L24	29	MP3-05	40.25 - 40.50	Auto	0.3652
L24	30	MP3-05	40.25 - 40.50	Auto	0.3652
L24	32	MP3-05	40.50 - 45.25	Auto	0.3784
L24	33	MP3-05	40.50 - 45.25	Auto	0.3784
L24	34	MP3-05	40.50 - 45.25	Auto	0.3784
L25	19	4.375" x 1.25" Plate	38.08 - 40.25	Auto	0.2189
L25	20	4.375" x 1.25" Plate	38.08 - 40.25	Auto	0.2189
L25	21	4.375" x 1.25" Plate	38.08 - 40.25	Auto	0.2189
L25	27	MP3-05	38.08 - 40.25	Auto	0.3588
L25	29	MP3-05	38.08 - 40.25	Auto	0.3588
L25	30	MP3-05	38.08 - 40.25	Auto	0.3588
L26	19	4.375" x 1.25" Plate	37.83 - 38.08	Auto	0.2513
L26	20	4.375" x 1.25" Plate	37.83 - 38.08	Auto	0.2513
L26	21	4.375" x 1.25" Plate	37.83 - 38.08	Auto	0.2513
L26	27	MP3-05	37.83 - 38.08	Auto	0.3855
L26	29	MP3-05	37.83 - 38.08	Auto	0.3855
L26	30	MP3-05	37.83 - 38.08	Auto	0.3855
L27	19	4.375" x 1.25" Plate	32.83 - 37.83	Auto	0.2294
L27	20	4.375" x 1.25" Plate	32.83 - 37.83	Auto	0.2294
L27	21	4.375" x 1.25" Plate	32.83 - 37.83	Auto	0.2294
L27	27	MP3-05	32.83 - 37.83	Auto	0.3675
L27	29	MP3-05	32.83 - 37.83	Auto	0.3675
L27	30	MP3-05	32.83 - 37.83	Auto	0.3675
L28	14	5.25" x 1.25" Plate	27.73 - 29.75	Auto	0.3309
L28	16	5.25" x 1.25" Plate	27.73 - 29.75	Auto	0.3309

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L28	17	5.25" x 1.25" Plate	27.73 - 29.75	Auto	0.3309
L28	19	4.375" x 1.25" Plate	29.75 - 32.83	Auto	0.2135
L28	20	4.375" x 1.25" Plate	29.75 - 32.83	Auto	0.2135
L28	21	4.375" x 1.25" Plate	29.75 - 32.83	Auto	0.2135
L28	27	MP3-05	27.73 - 32.83	Auto	0.3491
L28	29	MP3-05	27.73 - 32.83	Auto	0.3491
L28	30	MP3-05	27.73 - 32.83	Auto	0.3491
L29	14	5.25" x 1.25" Plate	27.50 - 27.73	Auto	0.3248
L29	16	5.25" x 1.25" Plate	27.50 - 27.73	Auto	0.3248
L29	17	5.25" x 1.25" Plate	27.50 - 27.73	Auto	0.3248
L29	27	MP3-05	27.50 - 27.73	Auto	0.3350
L29	29	MP3-05	27.50 - 27.73	Auto	0.3350
L29	30	MP3-05	27.50 - 27.73	Auto	0.3350
L30	14	5.25" x 1.25" Plate	22.50 - 27.50	Auto	0.3024
L30	16	5.25" x 1.25" Plate	22.50 - 27.50	Auto	0.3024
L30	17	5.25" x 1.25" Plate	22.50 - 27.50	Auto	0.3024
L30	27	MP3-05	22.50 - 27.50	Auto	0.3129
L30	29	MP3-05	22.50 - 27.50	Auto	0.3129
L30	30	MP3-05	22.50 - 27.50	Auto	0.3129
L31	14	5.25" x 1.25" Plate	19.50 - 22.50	Auto	0.2768
L31	16	5.25" x 1.25" Plate	19.50 - 22.50	Auto	0.2768
L31	17	5.25" x 1.25" Plate	19.50 - 22.50	Auto	0.2768
L31	27	MP3-05	19.50 - 22.50	Auto	0.2876
L31	29	MP3-05	19.50 - 22.50	Auto	0.2876
L31	30	MP3-05	19.50 - 22.50	Auto	0.2876
L31	41	CCI 4.5" x 1" Plate	19.50 - 21.00	Auto	0.1515
L32	14	5.25" x 1.25" Plate	19.25 - 19.50	Auto	0.3058
L32	16	5.25" x 1.25" Plate	19.25 - 19.50	Auto	0.3058
L32	17	5.25" x 1.25" Plate	19.25 - 19.50	Auto	0.3058
L32	27	MP3-05	19.25 - 19.50	Auto	0.3162
L32	29	MP3-05	19.25 - 19.50	Auto	0.3162
L32	30	MP3-05	19.25 - 19.50	Auto	0.3162
L32	41	CCI 4.5" x 1" Plate	19.25 - 19.50	Auto	0.1900
L33	14	5.25" x 1.25" Plate	14.25 - 19.25	Auto	0.2833
L33	15	5.25" x 1.25" Plate	14.25 - 15.50	Auto	0.2732
L33	16	5.25" x 1.25" Plate	14.25 - 19.25	Auto	0.2833
L33	17	5.25" x 1.25" Plate	14.25 - 19.25	Auto	0.2833
L33	27	MP3-05	14.25 - 19.25	Auto	0.2940
L33	28	MP3-05	14.25 - 15.50	Auto	0.2841
L33	29	MP3-05	14.25 - 19.25	Auto	0.2940
L33	30	MP3-05	14.25 - 19.25	Auto	0.2940
L33	40	CCI 4.5" x 1" Plate	14.25 - 15.50	Auto	0.1521
L33	41	CCI 4.5" x 1" Plate	14.25 - 19.25	Auto	0.1638
L34	14	5.25" x 1.25" Plate	14.00 - 14.25	Auto	0.2692
L34	15	5.25" x 1.25" Plate	14.00 - 14.25	Auto	0.2692
L34	16	5.25" x 1.25" Plate	14.00 - 14.25	Auto	0.2692
L34	17	5.25" x 1.25" Plate	14.00 - 14.25	Auto	0.2692
L34	27	MP3-05	14.00 - 14.25	Auto	0.2802
L34	28	MP3-05	14.00 - 14.25	Auto	0.2802
L34	29	MP3-05	14.00 - 14.25	Auto	0.2802
L34	30	MP3-05	14.00 - 14.25	Auto	0.2802
L34	40	CCI 4.5" x 1" Plate	14.00 - 14.25	Auto	0.1474
L34	41	CCI 4.5" x 1" Plate	14.00 - 14.25	Auto	0.1474
L35	14	5.25" x 1.25" Plate	13.75 - 14.00	Auto	0.2679
L35	15	5.25" x 1.25" Plate	13.75 - 14.00	Auto	0.2679
L35	16	5.25" x 1.25" Plate	13.75 - 14.00	Auto	0.2679
L35	17	5.25" x 1.25" Plate	13.75 - 14.00	Auto	0.2679
L35	27	MP3-05	13.75 - 14.00	Auto	0.2788
L35	28	MP3-05	13.75 - 14.00	Auto	0.2788
L35	29	MP3-05	13.75 - 14.00	Auto	0.2788
L35	30	MP3-05	13.75 - 14.00	Auto	0.2788

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L35	40	CCI 4.5" x 1" Plate	13.75 - 14.00	Auto	0.1458
L35	41	CCI 4.5" x 1" Plate	13.75 - 14.00	Auto	0.1458
L36	14	5.25" x 1.25" Plate	12.98 - 13.75	Auto	0.3657
L36	15	5.25" x 1.25" Plate	12.98 - 13.75	Auto	0.3657
L36	16	5.25" x 1.25" Plate	12.98 - 13.75	Auto	0.3657
L36	17	5.25" x 1.25" Plate	12.98 - 13.75	Auto	0.3657
L36	27	MP3-05	12.98 - 13.75	Auto	0.3752
L36	28	MP3-05	12.98 - 13.75	Auto	0.3752
L36	29	MP3-05	12.98 - 13.75	Auto	0.3752
L36	30	MP3-05	12.98 - 13.75	Auto	0.3752
L36	40	CCI 4.5" x 1" Plate	12.98 - 13.75	Auto	0.2600
L36	41	CCI 4.5" x 1" Plate	12.98 - 13.75	Auto	0.2600
L37	14	5.25" x 1.25" Plate	12.82 - 12.98	Auto	0.3213
L37	15	5.25" x 1.25" Plate	12.82 - 12.98	Auto	0.3213
L37	16	5.25" x 1.25" Plate	12.82 - 12.98	Auto	0.3213
L37	17	5.25" x 1.25" Plate	12.82 - 12.98	Auto	0.3213
L37	27	MP3-05	12.82 - 12.98	Auto	0.3315
L37	28	MP3-05	12.82 - 12.98	Auto	0.3315
L37	29	MP3-05	12.82 - 12.98	Auto	0.3315
L37	30	MP3-05	12.82 - 12.98	Auto	0.3315
L37	40	CCI 4.5" x 1" Plate	12.82 - 12.98	Auto	0.2082
L37	41	CCI 4.5" x 1" Plate	12.82 - 12.98	Auto	0.2082
L38	14	5.25" x 1.25" Plate	12.65 - 12.82	Auto	0.2869
L38	15	5.25" x 1.25" Plate	12.65 - 12.82	Auto	0.2869
L38	16	5.25" x 1.25" Plate	12.65 - 12.82	Auto	0.2869
L38	17	5.25" x 1.25" Plate	12.65 - 12.82	Auto	0.2869
L38	27	MP3-05	12.65 - 12.82	Auto	0.2976
L38	28	MP3-05	12.65 - 12.82	Auto	0.2976
L38	29	MP3-05	12.65 - 12.82	Auto	0.2976
L38	30	MP3-05	12.65 - 12.82	Auto	0.2976
L38	40	CCI 4.5" x 1" Plate	12.65 - 12.82	Auto	0.1680
L38	41	CCI 4.5" x 1" Plate	12.65 - 12.82	Auto	0.1680
L39	14	5.25" x 1.25" Plate	12.50 - 12.65	Auto	0.2860
L39	15	5.25" x 1.25" Plate	12.50 - 12.65	Auto	0.2860
L39	16	5.25" x 1.25" Plate	12.50 - 12.65	Auto	0.2860
L39	17	5.25" x 1.25" Plate	12.50 - 12.65	Auto	0.2860
L39	27	MP3-05	12.50 - 12.65	Auto	0.2967
L39	28	MP3-05	12.50 - 12.65	Auto	0.2967
L39	29	MP3-05	12.50 - 12.65	Auto	0.2967
L39	30	MP3-05	12.50 - 12.65	Auto	0.2967
L39	40	CCI 4.5" x 1" Plate	12.50 - 12.65	Auto	0.1670
L39	41	CCI 4.5" x 1" Plate	12.50 - 12.65	Auto	0.1670
L40	14	5.25" x 1.25" Plate	12.25 - 12.50	Auto	0.2682
L40	15	5.25" x 1.25" Plate	12.25 - 12.50	Auto	0.2682
L40	16	5.25" x 1.25" Plate	12.25 - 12.50	Auto	0.2682
L40	17	5.25" x 1.25" Plate	12.25 - 12.50	Auto	0.2682
L40	27	MP3-05	12.25 - 12.50	Auto	0.2792
L40	28	MP3-05	12.25 - 12.50	Auto	0.2792
L40	29	MP3-05	12.25 - 12.50	Auto	0.2792
L40	30	MP3-05	12.25 - 12.50	Auto	0.2792
L40	40	CCI 4.5" x 1" Plate	12.25 - 12.50	Auto	0.1462
L40	41	CCI 4.5" x 1" Plate	12.25 - 12.50	Auto	0.1462
L41	14	5.25" x 1.25" Plate	7.25 - 12.25	Auto	0.2499
L41	15	5.25" x 1.25" Plate	7.25 - 12.25	Auto	0.2499
L41	16	5.25" x 1.25" Plate	10.25 - 12.25	Auto	0.2580
L41	17	5.25" x 1.25" Plate	7.25 - 12.25	Auto	0.2499
L41	27	MP3-05	7.25 - 12.25	Auto	0.2612
L41	28	MP3-05	7.25 - 12.25	Auto	0.2612
L41	29	MP3-05	10.50 - 12.25	Auto	0.2698
L41	30	MP3-05	7.25 - 12.25	Auto	0.2612
L41	40	CCI 4.5" x 1" Plate	7.25 - 12.25	Auto	0.1249

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L41	41	CCI 4.5" x 1" Plate	11.00 - 12.25	Auto	0.1366
L42	14	5.25" x 1.25" Plate	2.25 - 7.25	Auto	0.2189
L42	15	5.25" x 1.25" Plate	2.25 - 7.25	Auto	0.2189
L42	17	5.25" x 1.25" Plate	2.25 - 7.25	Auto	0.2189
L42	27	MP3-05	2.25 - 7.25	Auto	0.2306
L42	28	MP3-05	2.25 - 7.25	Auto	0.2306
L42	30	MP3-05	2.25 - 7.25	Auto	0.2306
L42	40	CCI 4.5" x 1" Plate	2.25 - 7.25	Auto	0.0887
L43	14	5.25" x 1.25" Plate	0.00 - 2.25	Auto	0.1953
L43	15	5.25" x 1.25" Plate	0.00 - 2.25	Auto	0.1953
L43	17	5.25" x 1.25" Plate	0.00 - 2.25	Auto	0.1953
L43	27	MP3-05	0.00 - 2.25	Auto	0.2073
L43	28	MP3-05	0.00 - 2.25	Auto	0.2073
L43	30	MP3-05	0.00 - 2.25	Auto	0.2073
L43	40	CCI 4.5" x 1" Plate	0.00 - 2.25	Auto	0.0611

Discrete Tower Loads

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
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.090 4.490 4.890 5.720	3.300 3.680 4.070 4.870	0.066 0.130 0.204 0.386
SBNHH-1D65B	A	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.160 4.570 4.990 5.850	2.490 2.880 3.270 4.090	0.041 0.091 0.148 0.281
SBNHH-1D65B	B	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.160 4.570 4.990 5.850	2.490 2.880 3.270 4.090	0.041 0.091 0.148 0.281
SBNHH-1D65B	C	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.160 4.570 4.990 5.850	2.490 2.880 3.270 4.090	0.041 0.091 0.148 0.281
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.340 8.080 8.830 10.380	5.510 6.220 6.940 8.440	0.058 0.115 0.183 0.351
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.340 8.080 8.830 10.380	5.510 6.220 6.940 8.440	0.058 0.115 0.183 0.351
BXA-70063/6CF w/ Mount	C	From Leg	4.000	0.000	105.000	No Ice	7.340	5.510	0.058

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			0.000			1/2" Ice	8.080	6.220	0.115
			2.000			1" Ice	8.830	6.940	0.183
						2" Ice	10.380	8.440	0.351
DB-T1-6Z-8AB-0Z	A	From Leg	4.000	0.000	105.000	No Ice	4.800	2.000	0.044
			0.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
						2" Ice	5.926	2.815	0.213
RFV01U-D2A	A	From Leg	4.000	0.000	105.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
RFV01U-D2A	B	From Leg	4.000	0.000	105.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
RFV01U-D2A	C	From Leg	4.000	0.000	105.000	No Ice	1.875	1.013	0.070
			0.000			1/2" Ice	2.045	1.145	0.087
			0.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
(2) RFV01U-D1A	A	From Leg	4.000	0.000	105.000	No Ice	1.875	1.250	0.084
			0.000			1/2" Ice	2.045	1.393	0.103
			0.000			1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
RFV01U-D1A	C	From Leg	4.000	0.000	105.000	No Ice	1.875	1.250	0.084
			0.000			1/2" Ice	2.045	1.393	0.103
			0.000			1" Ice	2.223	1.543	0.124
						2" Ice	2.601	1.865	0.175
RVZDC-6627-PF-48	B	From Leg	4.000	0.000	105.000	No Ice	3.792	2.514	0.032
			0.000			1/2" Ice	4.044	2.727	0.063
			0.000			1" Ice	4.303	2.947	0.099
						2" Ice	4.844	3.417	0.181
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	0.000	105.000	No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
			0.000			1" Ice	5.615	3.624	0.180
						2" Ice	6.362	4.631	0.288
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	0.000	105.000	No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
			0.000			1" Ice	5.615	3.624	0.180
						2" Ice	6.362	4.631	0.288
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	0.000	105.000	No Ice	4.907	2.682	0.096
			0.000			1/2" Ice	5.256	3.145	0.136
			0.000			1" Ice	5.615	3.624	0.180
						2" Ice	6.362	4.631	0.288
CommScopeBASMNT-SBS-1-2	C	None		0.000	105.000	No Ice	3.600	3.600	0.075
						1/2" Ice	4.180	4.180	0.105
						1" Ice	4.750	4.750	0.135
						2" Ice	5.900	5.900	0.195
Sector Mount [SM 401-3]	C	None		0.000	105.000	No Ice	17.820	17.820	0.804
						1/2" Ice	25.010	25.010	1.143
						1" Ice	32.110	32.110	1.600
						2" Ice	46.160	46.160	2.869
*									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000	0.000	98.000	No Ice	5.190	2.710	0.128
			0.000			1/2" Ice	5.590	3.040	0.174
			1.000			1" Ice	6.020	3.380	0.227
						2" Ice	6.900	4.120	0.354
AIR6449 B41_T-MOBILE	B	From Leg	4.000	0.000	98.000	No Ice	5.190	2.710	0.128

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe			0.000				1/2" Ice	5.590	3.040	0.174
			1.000				1" Ice	6.020	3.380	0.227
							2" Ice	6.900	4.120	0.354
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000		0.000	98.000	No Ice	5.190	2.710	0.128
			0.000				1/2" Ice	5.590	3.040	0.174
			1.000				1" Ice	6.020	3.380	0.227
							2" Ice	6.900	4.120	0.354
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.000		0.000	98.000	No Ice	14.690	6.870	0.183
			0.000				1/2" Ice	15.460	7.550	0.311
			1.000				1" Ice	16.230	8.250	0.453
							2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.000		0.000	98.000	No Ice	14.690	6.870	0.183
			0.000				1/2" Ice	15.460	7.550	0.311
			1.000				1" Ice	16.230	8.250	0.453
							2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.000		0.000	98.000	No Ice	14.690	6.870	0.183
			0.000				1/2" Ice	15.460	7.550	0.311
			1.000				1" Ice	16.230	8.250	0.453
							2" Ice	17.820	9.670	0.782
VV-65A-R1_TMO w/ Mount Pipe	A	From Leg	4.000		0.000	98.000	No Ice	4.460	2.690	0.054
			0.000				1/2" Ice	4.910	3.100	0.097
			1.000				1" Ice	5.360	3.520	0.149
							2" Ice	6.320	4.410	0.281
VV-65A-R1_TMO w/ Mount Pipe	B	From Leg	4.000		0.000	98.000	No Ice	4.460	2.690	0.054
			0.000				1/2" Ice	4.910	3.100	0.097
			1.000				1" Ice	5.360	3.520	0.149
							2" Ice	6.320	4.410	0.281
VV-65A-R1_TMO w/ Mount Pipe	C	From Leg	4.000		0.000	98.000	No Ice	4.460	2.690	0.054
			0.000				1/2" Ice	4.910	3.100	0.097
			1.000				1" Ice	5.360	3.520	0.149
							2" Ice	6.320	4.410	0.281
RADIO 4480 B71_TMO	A	From Leg	4.000		0.000	98.000	No Ice	2.852	1.383	0.093
			0.000				1/2" Ice	3.064	1.543	0.114
			1.000				1" Ice	3.284	1.710	0.139
							2" Ice	3.745	2.073	0.199
(2) RADIO 4480 B71_TMO	B	From Leg	4.000		0.000	98.000	No Ice	2.852	1.383	0.093
			0.000				1/2" Ice	3.064	1.543	0.114
			1.000				1" Ice	3.284	1.710	0.139
							2" Ice	3.745	2.073	0.199
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000		0.000	98.000	No Ice	2.139	1.686	0.109
			0.000				1/2" Ice	2.321	1.850	0.131
			1.000				1" Ice	2.511	2.022	0.156
							2" Ice	2.912	2.387	0.217
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000		0.000	98.000	No Ice	2.139	1.686	0.109
			0.000				1/2" Ice	2.321	1.850	0.131
			1.000				1" Ice	2.511	2.022	0.156
							2" Ice	2.912	2.387	0.217
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.000		0.000	98.000	No Ice	2.139	1.686	0.109
			0.000				1/2" Ice	2.321	1.850	0.131
			1.000				1" Ice	2.511	2.022	0.156
							2" Ice	2.912	2.387	0.217
13.5' x 2 STD Horizontal Pipe	A	From Leg	4.000		0.000	98.000	No Ice	3.087	3.087	0.047
			0.000				1/2" Ice	4.416	4.416	0.070
				-2.000			1" Ice	5.760	5.760	0.102
							2" Ice	8.500	8.500	0.190
13.5' x 2 STD Horizontal Pipe	B	From Leg	4.000		0.000	98.000	No Ice	3.087	3.087	0.047
			0.000				1/2" Ice	4.416	4.416	0.070

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
			-2.000			1" Ice	5.760	5.760	0.102
						2" Ice	8.500	8.500	0.190
13.5' x 2 STD Horizontal Pipe	C	From Leg	4.000	0.000	98.000	No Ice	3.087	3.087	0.047
			0.000			1/2" Ice	4.416	4.416	0.070
			-2.000			1" Ice	5.760	5.760	0.102
						2" Ice	8.500	8.500	0.190
8' x 2" Mount Pipe	A	From Leg	4.000	0.000	98.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0.000	98.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0.000	98.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(2) Site Pro 1 PRK-SFS-L	A	From Leg	2.000	0.000	98.000	No Ice	1.500	0.005	0.025
			0.000			1/2" Ice	1.918	0.024	0.034
			-5.000			1" Ice	2.343	0.049	0.048
						2" Ice	3.215	0.123	0.091
(2) Site Pro 1 PRK-SFS-L	B	From Leg	2.000	0.000	98.000	No Ice	1.500	0.005	0.025
			0.000			1/2" Ice	1.918	0.024	0.034
			-5.000			1" Ice	2.343	0.049	0.048
						2" Ice	3.215	0.123	0.091
(2) Site Pro 1 PRK-SFS-L	C	From Leg	2.000	0.000	98.000	No Ice	1.500	0.005	0.025
			0.000			1/2" Ice	1.918	0.024	0.034
			-5.000			1" Ice	2.343	0.049	0.048
						2" Ice	3.215	0.123	0.091
Platform Mount [LP 1201-1_HR-1]	C	None		0.000	98.000	No Ice	26.390	26.390	2.356
						1/2" Ice	31.400	31.400	3.061
						1" Ice	36.200	36.200	3.864
						2" Ice	45.400	45.400	5.764
*									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
			0.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
			0.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
			0.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
			-1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083
			-1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000	0.000	96.000	No Ice	2.322	2.238	0.060
			0.000			1/2" Ice	2.527	2.441	0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
800MHz 2X50W RRH W/FILTER	A	From Leg	2.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHz 2X50W RRH W/FILTER	B	From Leg	2.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHz 2X50W RRH W/FILTER	C	From Leg	2.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
4' x 2" Pipe Mount	A	From Leg	1.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.785 1.028 1.281 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
4' x 2" Pipe Mount	B	From Leg	1.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.785 1.028 1.281 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
4' x 2" Pipe Mount	C	From Leg	1.000 0.000 0.000	0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.785 1.028 1.281 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
Side Arm Mount [SO 102-3]	C	None		0.000	96.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.600 4.180 4.750 5.900	3.600 4.180 4.750 5.900	0.075 0.105 0.135 0.195
*									
HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
HBX-6516DS-VTM w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.220 2.580 2.960 3.740	1.940 2.290 2.660 3.430	0.029 0.058 0.094 0.191
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.000	81.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
T-Arm Mount [TA 602-3]	C	None		0.000	81.000	No Ice 1/2" Ice	13.400 16.440	13.400 16.440	0.774 1.004

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	19.700	19.700	1.292
						2" Ice	25.860	25.860	2.053
*									
KS24019-L112A	A	From Leg	3.000 0.000 2.000	0.000	74.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.141 0.198 0.262 0.415	0.141 0.198 0.262 0.415	0.005 0.007 0.009 0.018
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	74.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.850 1.140 1.430 2.010	1.670 2.340 3.010 4.350	0.065 0.079 0.093 0.121
*									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Dragonwave A-ANT-18G-2-C	A	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 4.000	52.000		98.000	2.175	No Ice 1/2" Ice 1" Ice 2" Ice	3.720 4.010 4.300 4.880	0.027 0.048 0.068 0.109
Dragonwave A-ANT-23G-1-C	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 4.000	81.000		98.000	1.275	No Ice 1/2" Ice 1" Ice 2" Ice	1.280 1.450 1.620 1.970	0.007 0.010 0.012 0.013
**											

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

Comb. No.	Description
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	108 - 103	Pole	Max Tension	45	0.000	0.000	0.000
			Max. Compression	26	-7.070	0.071	1.511
			Max. Mx	20	-2.446	11.131	0.789
			Max. My	2	-2.454	0.264	11.896
			Max. Vy	8	3.802	-10.662	0.752
			Max. Vx	2	-3.899	0.264	11.896
			Max. Torque	10			0.490
L2	103 - 98.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-7.475	-0.002	1.898
			Max. Mx	20	-2.645	29.478	0.551
			Max. My	2	-2.672	-0.044	30.455
			Max. Vy	20	-4.245	29.478	0.551
			Max. Vx	14	4.189	0.541	-28.603
			Max. Torque	22			-1.131
L3	98.5 - 98	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-7.531	-0.005	1.898
			Max. Mx	20	-2.684	31.605	0.505
			Max. My	2	-2.711	-0.085	32.551
			Max. Vy	20	-4.264	31.605	0.505

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	4.207	0.595	-30.701
			Max. Torque	22			-1.119
L4	98 - 93	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-20.605	-1.545	1.936
			Max. Mx	8	-8.644	-80.728	1.362
			Max. My	2	-8.702	-1.111	80.997
			Max. Vy	20	-10.167	79.627	0.320
			Max. Vx	2	-10.063	-1.111	80.997
			Max. Torque	22			-1.358
L5	93 - 88	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.108	-1.591	1.963
			Max. Mx	8	-8.977	-131.900	1.590
			Max. My	2	-9.037	-1.311	131.791
			Max. Vy	20	-10.379	130.969	0.086
			Max. Vx	2	-10.266	-1.311	131.791
			Max. Torque	22			-1.357
L6	88 - 83	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.655	-1.629	1.978
			Max. Mx	8	-9.344	-184.106	1.811
			Max. My	2	-9.405	-1.505	183.551
			Max. Vy	20	-10.586	183.347	-0.153
			Max. Vx	2	-10.454	-1.505	183.551
			Max. Torque	22			-1.357
L7	83 - 82.873	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.672	-1.630	1.979
			Max. Mx	8	-9.362	-185.446	1.816
			Max. My	2	-9.424	-1.510	184.878
			Max. Vy	20	-10.585	184.691	-0.160
			Max. Vx	2	-10.453	-1.510	184.878
			Max. Torque	22			-1.356
L8	82.873 - 82.623	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.714	-1.631	1.979
			Max. Mx	8	-9.387	-188.085	1.827
			Max. My	2	-9.450	-1.520	187.491
			Max. Vy	20	-10.600	187.339	-0.172
			Max. Vx	2	-10.463	-1.520	187.491
			Max. Torque	22			-1.356
L9	82.623 - 77.623	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.979	-1.630	2.008
			Max. Mx	8	-10.940	-245.212	2.048
			Max. My	2	-11.029	-1.707	243.357
			Max. Vy	20	-12.122	244.650	-0.410
			Max. Vx	2	-11.684	-1.707	243.357
			Max. Torque	22			-1.355
L10	77.623 - 76.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.267	-1.624	2.019
			Max. Mx	8	-11.084	-261.902	2.109
			Max. My	2	-11.179	-1.758	259.432
			Max. Vy	20	-12.279	261.393	-0.475
			Max. Vx	2	-11.748	-1.758	259.432
			Max. Torque	22			-1.356
L11	76.25 - 76	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.335	-1.623	2.021
			Max. Mx	8	-11.134	-264.965	2.120
			Max. My	2	-11.229	-1.768	262.369
			Max. Vy	20	-12.301	264.464	-0.487
			Max. Vx	2	-11.762	-1.768	262.369
			Max. Torque	22			-1.356
L12	76 - 75.75	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-25.400	-1.622	2.023
			Max. Mx	8	-11.172	-268.034	2.131
			Max. My	2	-11.268	-1.777	265.311
			Max. Vy	20	-12.331	267.543	-0.499
			Max. Vx	2	-11.774	-1.777	265.311
			Max. Torque	22			-1.356
L13	75.75 - 74.333	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.768	-1.616	2.033
			Max. Mx	8	-11.384	-285.572	2.194
			Max. My	2	-11.487	-1.829	282.042
			Max. Vy	20	-12.505	285.135	-0.567
			Max. Vx	2	-11.851	-1.829	282.042
			Max. Torque	22			-1.357
L14	74.333 - 74.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.836	-1.615	2.035
			Max. Mx	8	-11.432	-288.691	2.205
			Max. My	2	-11.536	-1.838	285.004
			Max. Vy	20	-12.528	288.263	-0.579
			Max. Vx	2	-11.858	-1.838	285.004
			Max. Torque	22			-1.357
L15	74.083 - 69.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.325	-1.590	2.398
			Max. Mx	8	-12.335	-353.050	2.618
			Max. My	2	-12.461	-2.021	345.373
			Max. Vy	20	-13.214	352.809	-0.624
			Max. Vx	2	-12.166	-2.021	345.373
			Max. Torque	22			-1.523
L16	69.083 - 64.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-28.697	-1.562	2.432
			Max. Mx	8	-13.184	-420.397	2.836
			Max. My	2	-13.326	-2.203	406.808
			Max. Vy	20	-13.811	420.345	-0.865
			Max. Vx	2	-12.420	-2.203	406.808
			Max. Torque	22			-1.522
L17	64.083 - 59.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.088	-1.530	2.463
			Max. Mx	20	-14.052	490.855	-1.107
			Max. My	2	-14.207	-2.383	469.493
			Max. Vy	20	-14.406	490.855	-1.107
			Max. Vx	2	-12.668	-2.383	469.493
			Max. Torque	22			-1.521
L18	59.083 - 58.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.374	-1.524	2.469
			Max. Mx	20	-14.229	505.315	-1.155
			Max. My	2	-14.384	-2.419	482.196
			Max. Vy	20	-14.526	505.315	-1.155
			Max. Vx	2	-12.753	-2.419	482.196
			Max. Torque	22			-1.521
L19	58.083 - 57.733	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.484	-1.522	2.471
			Max. Mx	20	-14.306	510.404	-1.172
			Max. My	2	-14.460	-2.432	486.662
			Max. Vy	20	-14.563	510.404	-1.172
			Max. Vx	2	-12.779	-2.432	486.662
			Max. Torque	22			-1.521

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L20	57.733 - 57.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-30.558	-1.520	2.472
			Max. Mx	20	-14.355	513.800	-1.183
			Max. My	2	-14.509	-2.440	489.641
			Max. Vy	20	-14.591	513.800	-1.183
			Max. Vx	2	-12.799	-2.440	489.641
			Max. Torque	22			-1.521
L21	57.5 - 52.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.127	-1.485	2.500
			Max. Mx	20	-15.377	588.262	-1.426
			Max. My	2	-15.530	-2.618	554.700
			Max. Vy	20	-15.202	588.262	-1.426
			Max. Vx	2	-13.236	-2.618	554.700
			Max. Torque	22			-1.520
L22	52.5 - 47	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.838	-1.468	2.512
			Max. Mx	20	-15.847	622.751	-1.535
			Max. My	2	-16.002	-2.698	584.586
			Max. Vy	20	-15.470	622.751	-1.535
			Max. Vx	2	-13.347	-2.698	584.586
			Max. Torque	22			-1.520
L23	47 - 45.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.251	-1.431	2.538
			Max. Mx	20	-17.561	701.740	-1.777
			Max. My	2	-17.723	-2.875	652.057
			Max. Vy	20	-16.125	701.740	-1.777
			Max. Vx	2	-13.646	-2.875	652.057
			Max. Torque	22			-1.519
L24	45.25 - 40.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.934	-1.388	2.555
			Max. Mx	20	-18.733	783.731	-2.021
			Max. My	2	-18.889	-3.051	720.791
			Max. Vy	20	-16.695	783.731	-2.021
			Max. Vx	2	-13.872	-3.051	720.791
			Max. Torque	22			-1.519
L25	40.25 - 38.083	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.670	-1.368	2.558
			Max. Mx	20	-19.246	820.156	-2.127
			Max. My	2	-19.399	-3.126	750.937
			Max. Vy	20	-16.941	820.156	-2.127
			Max. Vx	2	-13.971	-3.126	750.937
			Max. Torque	22			-1.519
L26	38.083 - 37.833	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.758	-1.365	2.559
			Max. Mx	20	-19.315	824.393	-2.139
			Max. My	2	-19.466	-3.135	754.428
			Max. Vy	20	-16.961	824.393	-2.139
			Max. Vx	2	-13.975	-3.135	754.428
			Max. Torque	22			-1.519
L27	37.833 - 32.833	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.511	-1.317	2.566
			Max. Mx	20	-20.549	910.611	-2.382
			Max. My	2	-20.693	-3.308	824.865
			Max. Vy	20	-17.536	910.611	-2.382
			Max. Vx	2	-14.212	-3.308	824.865
			Max. Torque	22			-1.518
L28	32.833 - 27.733	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.382	-1.267	2.573

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-21.899	1001.444	-2.631
			Max. My	2	-22.030	-3.483	897.884
			Max. Vy	20	-18.102	1001.444	-2.631
			Max. Vx	2	-14.442	-3.483	897.884
			Max. Torque	22			-1.518
L29	27.733 - 27.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.468	-1.265	2.574
			Max. Mx	20	-21.968	1005.662	-2.642
			Max. My	2	-22.096	-3.491	901.248
			Max. Vy	20	-18.120	1005.662	-2.642
			Max. Vx	2	-14.445	-3.491	901.248
			Max. Torque	22			-1.518
L30	27.5 - 22.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.318	-1.215	2.581
			Max. Mx	20	-23.307	1097.575	-2.885
			Max. My	2	-23.420	-3.661	973.983
			Max. Vy	20	-18.656	1097.575	-2.885
			Max. Vx	2	-14.662	-3.661	973.983
			Max. Torque	22			-1.518
L31	22.5 - 19.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.443	-1.173	2.593
			Max. Mx	20	-24.126	1153.972	-3.031
			Max. My	2	-24.227	-3.762	1018.115
			Max. Vy	20	-18.960	1153.972	-3.031
			Max. Vx	2	-14.780	-3.762	1018.115
			Max. Torque	22			-1.517
L32	19.5 - 19.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.542	-1.169	2.595
			Max. Mx	20	-24.206	1158.713	-3.043
			Max. My	2	-24.304	-3.770	1021.809
			Max. Vy	20	-18.977	1158.713	-3.043
			Max. Vx	2	-14.783	-3.770	1021.809
			Max. Torque	22			-1.517
L33	19.25 - 14.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.559	-1.075	2.616
			Max. Mx	20	-25.659	1254.820	-3.285
			Max. My	2	-25.737	-3.937	1096.193
			Max. Vy	20	-19.477	1254.820	-3.285
			Max. Vx	2	-14.984	-3.937	1096.193
			Max. Torque	22			-1.517
L34	14.25 - 14	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.666	-1.070	2.616
			Max. Mx	20	-25.739	1259.690	-3.297
			Max. My	2	-25.814	-3.945	1099.939
			Max. Vy	20	-19.492	1259.690	-3.297
			Max. Vx	2	-14.995	-3.945	1099.939
			Max. Torque	22			-1.517
L35	14 - 13.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.772	-1.064	2.615
			Max. Mx	20	-25.813	1264.566	-3.309
			Max. My	2	-25.887	-3.953	1103.689
			Max. Vy	20	-19.516	1264.566	-3.309
			Max. Vx	2	-15.013	-3.953	1103.689
			Max. Torque	22			-1.517
L36	13.75 - 12.983	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.172	-1.047	2.614
			Max. Mx	20	-26.107	1279.564	-3.346
			Max. My	2	-26.179	-3.979	1115.225
			Max. Vy	20	-19.599	1279.564	-3.346
			Max. Vx	2	-15.078	-3.979	1115.225
			Max. Torque	22			-1.517

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L37	12.983 - 12.817	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.254	-1.044	2.614
			Max. Mx	20	-26.171	1282.818	-3.354
			Max. My	2	-26.241	-3.984	1117.728
			Max. Vy	20	-19.610	1282.818	-3.354
			Max. Vx	2	-15.088	-3.984	1117.728
			Max. Torque	22			-1.517
L38	12.817 - 12.65	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.333	-1.040	2.613
			Max. Mx	20	-26.228	1286.095	-3.362
			Max. My	2	-26.297	-3.990	1120.249
			Max. Vy	20	-19.627	1286.095	-3.362
			Max. Vx	2	-15.100	-3.990	1120.249
			Max. Torque	22			-1.517
L39	12.65 - 12.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.404	-1.037	2.613
			Max. Mx	20	-26.279	1289.040	-3.369
			Max. My	2	-26.348	-3.995	1122.514
			Max. Vy	20	-19.642	1289.040	-3.369
			Max. Vx	2	-15.112	-3.995	1122.514
			Max. Torque	22			-1.517
L40	12.5 - 12.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.517	-1.031	2.613
			Max. Mx	20	-26.359	1293.953	-3.382
			Max. My	2	-26.427	-4.003	1126.294
			Max. Vy	20	-19.667	1293.953	-3.382
			Max. Vx	2	-15.131	-4.003	1126.294
			Max. Torque	22			-1.517
L41	12.25 - 7.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.680	-0.974	2.572
			Max. Mx	20	-27.968	1392.870	-3.622
			Max. My	2	-28.011	-4.167	1202.401
			Max. Vy	8	20.008	-1391.396	5.185
			Max. Vx	2	-15.326	-4.167	1202.401
			Max. Torque	22			-1.517
L42	7.25 - 2.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.776	-0.941	2.525
			Max. Mx	20	-29.600	1492.864	-3.863
			Max. My	2	-29.615	-4.329	1279.438
			Max. Vy	8	20.205	-1491.861	5.379
			Max. Vx	2	-15.510	-4.329	1279.438
			Max. Torque	22			-1.517
L43	2.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-52.690	-0.927	2.506
			Max. Mx	20	-30.341	1538.178	-3.971
			Max. My	2	-30.344	-4.402	1314.404
			Max. Vy	8	20.293	-1537.388	5.465
			Max. Vx	2	-15.594	-4.402	1314.404
			Max. Torque	22			-1.517

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	52.690	-5.286	0.011

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	21	22.763	20.180	-0.047
	Max. H_z	2	30.351	-0.034	15.581
	Max. M_x	2	1314.404	-0.034	15.581
	Max. M_z	8	1537.388	-20.278	0.039
	Max. Torsion	10	1.506	-14.448	-8.361
	Min. Vert	5	22.763	-7.747	13.478
	Min. H_x	9	22.763	-20.278	0.039
	Min. H_z	14	30.351	0.062	-15.333
	Min. M_x	14	-1299.366	0.062	-15.333
	Min. M_z	20	-1538.178	20.180	-0.047
	Min. Torsion	22	-1.517	14.320	8.251

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	25.292	0.000	-0.000	-0.929	-0.504	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	30.351	0.034	-15.581	-1314.404	-4.402	0.625
0.9 Dead+1.0 Wind 0 deg - No Ice	22.763	0.034	-15.581	-1299.099	-4.182	0.610
1.2 Dead+1.0 Wind 30 deg - No Ice	30.351	7.747	-13.478	-1132.509	-649.430	0.047
0.9 Dead+1.0 Wind 30 deg - No Ice	22.763	7.747	-13.478	-1119.266	-641.855	0.045
1.2 Dead+1.0 Wind 60 deg - No Ice	30.351	14.114	-8.201	-675.139	-1157.056	-0.588
0.9 Dead+1.0 Wind 60 deg - No Ice	22.763	14.114	-8.201	-667.205	-1143.832	-0.576
1.2 Dead+1.0 Wind 90 deg - No Ice	30.351	20.278	-0.039	-5.465	-1537.388	-1.257
0.9 Dead+1.0 Wind 90 deg - No Ice	22.763	20.278	-0.039	-5.098	-1520.670	-1.233
1.2 Dead+1.0 Wind 120 deg - No Ice	30.351	14.448	8.361	687.522	-1188.706	-1.506
0.9 Dead+1.0 Wind 120 deg - No Ice	22.763	14.448	8.361	680.064	-1175.151	-1.478
1.2 Dead+1.0 Wind 150 deg - No Ice	30.351	8.022	13.994	1159.007	-663.552	-1.231
0.9 Dead+1.0 Wind 150 deg - No Ice	22.763	8.022	13.994	1146.168	-655.885	-1.206
1.2 Dead+1.0 Wind 180 deg - No Ice	30.351	-0.062	15.333	1299.366	6.090	-0.384
0.9 Dead+1.0 Wind 180 deg - No Ice	22.763	-0.062	15.333	1284.768	6.174	-0.368
1.2 Dead+1.0 Wind 210 deg - No Ice	30.351	-8.090	14.044	1164.009	669.420	0.183
0.9 Dead+1.0 Wind 210 deg - No Ice	22.763	-8.090	14.044	1151.134	662.017	0.186
1.2 Dead+1.0 Wind 240 deg - No Ice	30.351	-14.258	8.284	678.462	1165.520	0.775
0.9 Dead+1.0 Wind 240 deg - No Ice	22.763	-14.258	8.284	671.101	1152.556	0.763
1.2 Dead+1.0 Wind 270 deg - No Ice	30.351	-20.180	0.047	3.971	1538.178	1.399
0.9 Dead+1.0 Wind 270 deg -	22.763	-20.180	0.047	4.215	1521.760	1.375

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
No Ice 1.2 Dead+1.0 Wind 300 deg - No Ice	30.351	-14.320	-8.251	-682.758	1181.915	1.517
0.9 Dead+1.0 Wind 300 deg - No Ice	22.763	-14.320	-8.251	-674.745	1168.727	1.490
1.2 Dead+1.0 Wind 330 deg - No Ice	30.351	-8.120	-14.217	-1173.884	666.285	1.249
0.9 Dead+1.0 Wind 330 deg - No Ice	22.763	-8.120	-14.217	-1160.324	658.940	1.225
1.2 Dead+1.0 Ice+1.0 Temp	52.690	0.000	-0.000	-2.506	-0.927	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	52.690	0.009	-4.497	-393.912	-2.049	0.182
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	52.690	2.244	-3.891	-341.170	-195.876	0.012
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	52.690	3.915	-2.269	-199.398	-339.638	-0.172
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	52.690	5.286	-0.011	-3.832	-432.716	-0.409
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	52.690	3.930	2.268	194.803	-342.466	-0.421
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	52.690	2.238	3.893	336.290	-195.188	-0.344
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	52.690	-0.015	4.497	388.810	0.823	-0.124
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	52.690	-2.250	3.896	336.519	194.668	0.042
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	52.690	-3.920	2.272	194.617	338.387	0.215
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	52.690	-5.290	0.012	-1.148	431.579	0.441
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	52.690	-3.932	-2.261	-199.210	340.897	0.423
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	52.690	-2.235	-3.900	-342.138	192.871	0.352
Dead+Wind 0 deg - Service	25.292	0.008	-3.886	-326.989	-1.449	0.155
Dead+Wind 30 deg - Service	25.292	1.932	-3.362	-281.837	-161.608	0.011
Dead+Wind 60 deg - Service	25.292	3.519	-2.045	-168.256	-287.598	-0.146
Dead+Wind 90 deg - Service	25.292	5.037	-0.010	-2.020	-380.388	-0.311
Dead+Wind 120 deg - Service	25.292	3.591	2.078	169.288	-294.234	-0.372
Dead+Wind 150 deg - Service	25.292	2.001	3.491	287.150	-165.167	-0.303
Dead+Wind 180 deg - Service	25.292	-0.015	3.825	321.925	1.131	-0.092
Dead+Wind 210 deg - Service	25.292	-2.017	3.502	288.267	165.811	0.046
Dead+Wind 240 deg - Service	25.292	-3.555	2.065	167.728	288.956	0.191
Dead+Wind 270 deg - Service	25.292	-5.013	0.012	0.300	379.850	0.345
Dead+Wind 300 deg - Service	25.292	-3.559	-2.051	-169.465	291.823	0.375
Dead+Wind 330 deg - Service	25.292	-2.026	-3.546	-292.170	165.111	0.309

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	0.000	-25.292	0.000	-0.000	25.292	0.000	0.000%
2	0.034	-30.351	-15.581	-0.034	30.351	15.581	0.000%
3	0.034	-22.763	-15.581	-0.034	22.763	15.581	0.000%
4	7.747	-30.351	-13.478	-7.747	30.351	13.478	0.000%
5	7.747	-22.763	-13.478	-7.747	22.763	13.478	0.000%
6	14.114	-30.351	-8.201	-14.114	30.351	8.201	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
7	14.114	-22.763	-8.201	-14.114	22.763	8.201	0.000%
8	20.278	-30.351	-0.039	-20.278	30.351	0.039	0.000%
9	20.278	-22.763	-0.039	-20.278	22.763	0.039	0.000%
10	14.448	-30.351	8.361	-14.448	30.351	-8.361	0.000%
11	14.448	-22.763	8.361	-14.448	22.763	-8.361	0.000%
12	8.022	-30.351	13.994	-8.022	30.351	-13.994	0.000%
13	8.022	-22.763	13.994	-8.022	22.763	-13.994	0.000%
14	-0.062	-30.351	15.333	0.062	30.351	-15.333	0.000%
15	-0.062	-22.763	15.333	0.062	22.763	-15.333	0.000%
16	-8.090	-30.351	14.044	8.090	30.351	-14.044	0.000%
17	-8.090	-22.763	14.044	8.090	22.763	-14.044	0.000%
18	-14.258	-30.351	8.284	14.258	30.351	-8.284	0.000%
19	-14.258	-22.763	8.284	14.258	22.763	-8.284	0.000%
20	-20.180	-30.351	0.047	20.180	30.351	-0.047	0.000%
21	-20.180	-22.763	0.047	20.180	22.763	-0.047	0.000%
22	-14.320	-30.351	-8.251	14.320	30.351	8.251	0.000%
23	-14.320	-22.763	-8.251	14.320	22.763	8.251	0.000%
24	-8.120	-30.351	-14.217	8.120	30.351	14.217	0.000%
25	-8.120	-22.763	-14.217	8.120	22.763	14.217	0.000%
26	0.000	-52.690	0.000	-0.000	52.690	0.000	0.000%
27	0.009	-52.690	-4.497	-0.009	52.690	4.497	0.000%
28	2.244	-52.690	-3.891	-2.244	52.690	3.891	0.000%
29	3.915	-52.690	-2.269	-3.915	52.690	2.269	0.000%
30	5.286	-52.690	-0.011	-5.286	52.690	0.011	0.000%
31	3.930	-52.690	2.268	-3.930	52.690	-2.268	0.000%
32	2.238	-52.690	3.893	-2.238	52.690	-3.893	0.000%
33	-0.015	-52.690	4.497	0.015	52.690	-4.497	0.000%
34	-2.250	-52.690	3.896	2.250	52.690	-3.896	0.000%
35	-3.920	-52.690	2.272	3.920	52.690	-2.272	0.000%
36	-5.290	-52.690	0.012	5.290	52.690	-0.012	0.000%
37	-3.932	-52.690	-2.261	3.932	52.690	2.261	0.000%
38	-2.235	-52.690	-3.900	2.235	52.690	3.900	0.000%
39	0.008	-25.292	-3.886	-0.008	25.292	3.886	0.000%
40	1.932	-25.292	-3.362	-1.932	25.292	3.362	0.000%
41	3.519	-25.292	-2.045	-3.519	25.292	2.045	0.000%
42	5.037	-25.292	-0.010	-5.037	25.292	0.010	0.000%
43	3.591	-25.292	2.078	-3.591	25.292	-2.078	0.000%
44	2.001	-25.292	3.491	-2.001	25.292	-3.491	0.000%
45	-0.015	-25.292	3.825	0.015	25.292	-3.825	0.000%
46	-2.017	-25.292	3.502	2.017	25.292	-3.502	0.000%
47	-3.555	-25.292	2.065	3.555	25.292	-2.065	0.000%
48	-5.013	-25.292	0.012	5.013	25.292	-0.012	0.000%
49	-3.559	-25.292	-2.051	3.559	25.292	2.051	0.000%
50	-2.026	-25.292	-3.546	2.026	25.292	3.546	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000714
2	Yes	5	0.00000001	0.00080278
3	Yes	5	0.00000001	0.00037768
4	Yes	6	0.00000001	0.00067132
5	Yes	6	0.00000001	0.00022764
6	Yes	6	0.00000001	0.00070613
7	Yes	6	0.00000001	0.00023851
8	Yes	6	0.00000001	0.00007716
9	Yes	5	0.00000001	0.00063961

10	Yes	6	0.00000001	0.00067184
11	Yes	6	0.00000001	0.00022407
12	Yes	6	0.00000001	0.00072351
13	Yes	6	0.00000001	0.00024584
14	Yes	5	0.00000001	0.00031408
15	Yes	5	0.00000001	0.00013650
16	Yes	6	0.00000001	0.00069028
17	Yes	6	0.00000001	0.00023346
18	Yes	6	0.00000001	0.00066537
19	Yes	6	0.00000001	0.00022391
20	Yes	6	0.00000001	0.00007157
21	Yes	5	0.00000001	0.00059556
22	Yes	6	0.00000001	0.00076343
23	Yes	6	0.00000001	0.00025784
24	Yes	6	0.00000001	0.00065047
25	Yes	6	0.00000001	0.00021824
26	Yes	5	0.00000001	0.00016854
27	Yes	6	0.00000001	0.00089830
28	Yes	7	0.00000001	0.00013747
29	Yes	7	0.00000001	0.00013831
30	Yes	6	0.00000001	0.00094139
31	Yes	7	0.00000001	0.00013366
32	Yes	7	0.00000001	0.00013431
33	Yes	6	0.00000001	0.00086785
34	Yes	7	0.00000001	0.00013116
35	Yes	7	0.00000001	0.00013075
36	Yes	6	0.00000001	0.00092588
37	Yes	7	0.00000001	0.00013801
38	Yes	7	0.00000001	0.00013390
39	Yes	5	0.00000001	0.00005373
40	Yes	5	0.00000001	0.00021476
41	Yes	5	0.00000001	0.00023815
42	Yes	5	0.00000001	0.00008771
43	Yes	5	0.00000001	0.00020101
44	Yes	5	0.00000001	0.00025611
45	Yes	4	0.00000001	0.00080476
46	Yes	5	0.00000001	0.00021834
47	Yes	5	0.00000001	0.00019897
48	Yes	5	0.00000001	0.00009188
49	Yes	5	0.00000001	0.00027839
50	Yes	5	0.00000001	0.00019525

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	108 - 103	16.006	42	1.460	0.015
L2	103 - 98.5	14.481	42	1.447	0.014
L3	98.5 - 98	13.152	42	1.360	0.008
L4	98 - 93	13.010	42	1.358	0.008
L5	93 - 88	11.615	42	1.300	0.006
L6	88 - 83	10.300	42	1.206	0.005
L7	83 - 82.873	9.098	42	1.085	0.004
L8	82.873 - 82.623	9.069	42	1.082	0.004
L9	82.623 - 77.623	9.013	42	1.078	0.004
L10	77.623 - 76.25	7.923	42	1.000	0.003
L11	76.25 - 76	7.639	42	0.978	0.003
L12	76 - 75.75	7.588	42	0.975	0.003
L13	75.75 - 74.333	7.537	42	0.972	0.003
L14	74.333 - 74.083	7.251	42	0.952	0.003

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L15	74.083 - 69.083	7.202	42	0.949	0.003
L16	69.083 - 64.083	6.239	42	0.889	0.002
L17	64.083 - 59.083	5.342	42	0.822	0.002
L18	59.083 - 58.083	4.518	42	0.750	0.002
L19	58.083 - 57.733	4.363	42	0.736	0.002
L20	57.733 - 57.5	4.309	42	0.731	0.002
L21	57.5 - 52.5	4.273	42	0.728	0.002
L22	52.5 - 47	3.548	42	0.657	0.001
L23	50.25 - 45.25	3.246	42	0.625	0.001
L24	45.25 - 40.25	2.612	42	0.576	0.001
L25	40.25 - 38.083	2.047	42	0.503	0.001
L26	38.083 - 37.833	1.826	42	0.471	0.001
L27	37.833 - 32.833	1.802	42	0.468	0.001
L28	32.833 - 27.733	1.346	42	0.402	0.001
L29	27.733 - 27.5	0.952	42	0.337	0.001
L30	27.5 - 22.5	0.936	42	0.334	0.001
L31	22.5 - 19.5	0.621	42	0.268	0.000
L32	19.5 - 19.25	0.465	42	0.227	0.000
L33	19.25 - 14.25	0.453	42	0.224	0.000
L34	14.25 - 14	0.250	42	0.165	0.000
L35	14 - 13.75	0.241	42	0.162	0.000
L36	13.75 - 12.983	0.233	42	0.159	0.000
L37	12.983 - 12.817	0.208	42	0.152	0.000
L38	12.817 - 12.65	0.203	42	0.150	0.000
L39	12.65 - 12.5	0.197	42	0.148	0.000
L40	12.5 - 12.25	0.193	42	0.147	0.000
L41	12.25 - 7.25	0.185	42	0.144	0.000
L42	7.25 - 2.25	0.065	42	0.085	0.000
L43	2.25 - 0	0.006	42	0.027	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
105.000	SBNHH-1D65B w/ Mount Pipe	42	15.088	1.465	0.015	4215
102.000	Dragonwave A-ANT-18G-2-C	42	14.179	1.427	0.012	3535
98.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	42	13.010	1.358	0.008	3490
96.000	PCS 1900MHz 4x45W-65MHz	42	12.445	1.343	0.008	4159
81.000	HBX-6516DS-VTM w/ Mount Pipe	42	8.650	1.058	0.003	3274
74.000	KS24019-L112A	42	7.185	0.948	0.003	4409

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	108 - 103	64.592	20	5.889	0.060
L2	103 - 98.5	58.446	20	5.831	0.055
L3	98.5 - 98	53.107	20	5.474	0.033
L4	98 - 93	52.537	20	5.466	0.033
L5	93 - 88	46.933	20	5.240	0.026
L6	88 - 83	41.640	20	4.868	0.020

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L7	83 - 82.873	36.793	20	4.383	0.015
L8	82.873 - 82.623	36.677	20	4.370	0.015
L9	82.623 - 77.623	36.449	20	4.356	0.015
L10	77.623 - 76.25	32.050	20	4.044	0.012
L11	76.25 - 76	30.901	20	3.953	0.011
L12	76 - 75.75	30.695	20	3.942	0.011
L13	75.75 - 74.333	30.489	20	3.929	0.011
L14	74.333 - 74.083	29.335	20	3.849	0.011
L15	74.083 - 69.083	29.134	20	3.838	0.011
L16	69.083 - 64.083	25.242	20	3.597	0.009
L17	64.083 - 59.083	21.617	20	3.327	0.008
L18	59.083 - 58.083	18.285	20	3.037	0.007
L19	58.083 - 57.733	17.656	20	2.978	0.007
L20	57.733 - 57.5	17.438	20	2.960	0.006
L21	57.5 - 52.5	17.294	20	2.947	0.006
L22	52.5 - 47	14.358	20	2.661	0.005
L23	50.25 - 45.25	13.136	20	2.529	0.005
L24	45.25 - 40.25	10.573	20	2.333	0.004
L25	40.25 - 38.083	8.285	20	2.036	0.004
L26	38.083 - 37.833	7.391	20	1.906	0.003
L27	37.833 - 32.833	7.291	20	1.893	0.003
L28	32.833 - 27.733	5.449	20	1.627	0.003
L29	27.733 - 27.5	3.852	20	1.363	0.002
L30	27.5 - 22.5	3.786	20	1.351	0.002
L31	22.5 - 19.5	2.512	20	1.083	0.002
L32	19.5 - 19.25	1.883	20	0.920	0.001
L33	19.25 - 14.25	1.835	20	0.908	0.001
L34	14.25 - 14	1.010	20	0.666	0.001
L35	14 - 13.75	0.976	20	0.654	0.001
L36	13.75 - 12.983	0.942	20	0.642	0.001
L37	12.983 - 12.817	0.841	20	0.615	0.001
L38	12.817 - 12.65	0.819	20	0.608	0.001
L39	12.65 - 12.5	0.798	20	0.601	0.001
L40	12.5 - 12.25	0.780	20	0.594	0.001
L41	12.25 - 7.25	0.749	20	0.582	0.001
L42	7.25 - 2.25	0.263	20	0.346	0.000
L43	2.25 - 0	0.025	20	0.108	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
105.000	SBNHH-1D65B w/ Mount Pipe	20	60.892	5.909	0.061	1218
102.000	Dragonwave A-ANT-18G-2-C	20	57.235	5.748	0.050	1008
98.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	20	52.537	5.466	0.033	952
96.000	PCS 1900MHz 4x45W-65MHz	20	50.270	5.407	0.031	1106
81.000	HBX-6516DS-VTM w/ Mount Pipe	20	34.986	4.276	0.014	827
74.000	KS24019-L112A	20	29.068	3.834	0.011	1104

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	108 - 103 (1)	TP8.625x8.625x0.313	5.000	0.000	0.0	8.161	-2.454	257.065	0.010
L2	103 - 98.5 (2)	TP8.625x8.625x0.313	4.500	0.000	0.0	8.161	-2.672	257.065	0.010
L3	98.5 - 98 (3)	TP16.5x16.5x0.313	0.500	0.000	0.0	15.892	-2.711	500.599	0.005
L4	98 - 93 (4)	TP17.3x16.5x0.188	5.000	0.000	0.0	10.184	-8.702	595.779	0.015
L5	93 - 88 (5)	TP18.101x17.3x0.188	5.000	0.000	0.0	10.660	-8.977	623.641	0.014
L6	88 - 83 (6)	TP18.901x18.101x0.188	5.000	0.000	0.0	11.137	-9.344	651.503	0.014
L7	83 - 82.873 (7)	TP18.921x18.901x0.188	0.127	0.000	0.0	11.149	-9.362	652.211	0.014
L8	82.873 - 82.623 (8)	TP18.961x18.921x0.363	0.250	0.000	0.0	21.399	-9.387	1251.850	0.007
L9	82.623 - 77.623 (9)	TP19.762x18.961x0.356	5.000	0.000	0.0	21.942	-10.940	1283.620	0.009
L10	77.623 - 76.25 (10)	TP19.981x19.762x0.356	1.373	0.000	0.0	22.191	-11.084	1298.160	0.009
L11	76.25 - 76 (11)	TP20.021x19.981x0.6	0.250	0.000	0.0	36.986	-11.134	2163.680	0.005
L12	76 - 75.75 (12)	TP20.061x20.021x0.456	0.250	0.000	0.0	28.391	-11.172	1660.860	0.007
L13	75.75 - 74.333 (13)	TP20.288x20.061x0.45	1.417	0.000	0.0	28.335	-11.384	1657.580	0.007
L14	74.333 - 74.083 (14)	TP20.328x20.288x0.588	0.250	0.000	0.0	36.811	-11.432	2153.430	0.005
L15	74.083 - 69.083 (15)	TP21.128x20.328x0.575	5.000	0.000	0.0	37.511	-12.335	2194.390	0.006
L16	69.083 - 64.083 (16)	TP21.929x21.128x0.55	5.000	0.000	0.0	37.321	-13.184	2183.270	0.006
L17	64.083 - 59.083 (17)	TP22.729x21.929x0.538	5.000	0.000	0.0	37.859	-14.052	2214.770	0.006
L18	59.083 - 58.083 (18)	TP22.889x22.729x0.538	1.000	0.000	0.0	38.132	-14.229	2230.740	0.006
L19	58.083 - 57.733 (19)	TP22.945x22.889x0.6	0.350	0.000	0.0	42.554	-14.306	2489.410	0.006
L20	57.733 - 57.5 (20)	TP22.982x22.945x0.6	0.233	0.000	0.0	42.625	-14.355	2493.560	0.006
L21	57.5 - 52.5 (21)	TP23.783x22.982x0.575	5.000	0.000	0.0	42.355	-15.377	2477.780	0.006
L22	52.5 - 47 (22)	TP24.663x23.783x0.575	5.500	0.000	0.0	43.012	-15.847	2516.230	0.006
L23	47 - 45.25 (23)	TP24.568x23.768x0.625	5.000	0.000	0.0	47.497	-17.561	2778.570	0.006
L24	45.25 - 40.25 (24)	TP25.368x24.568x0.613	5.000	0.000	0.0	48.127	-18.733	2815.430	0.007
L25	40.25 - 38.083 (25)	TP25.715x25.368x0.613	2.167	0.000	0.0	48.801	-19.246	2854.870	0.007
L26	38.083 - 37.833 (26)	TP25.755x25.715x0.713	0.250	0.000	0.0	56.633	-19.316	3313.040	0.006
L27	37.833 - 32.833 (27)	TP26.555x25.755x0.7	5.000	0.000	0.0	57.445	-20.549	3360.550	0.006
L28	32.833 - 27.733 (28)	TP27.372x26.555x0.725	5.100	0.000	0.0	61.318	-21.898	3587.080	0.006
L29	27.733 - 27.5 (29)	TP27.409x27.372x0.725	0.233	0.000	0.0	61.403	-21.968	3592.100	0.006
L30	27.5 - 22.5 (30)	TP28.209x27.409x0.7	5.000	0.000	0.0	61.119	-23.307	3575.490	0.007
L31	22.5 - 19.5 (31)	TP28.689x28.209x0.688	3.000	0.000	0.0	61.103	-24.126	3574.530	0.007
L32	19.5 - 19.25 (32)	TP28.729x28.689x0.8	0.250	0.000	0.0	70.918	-24.206	4148.690	0.006
L33	19.25 - 14.25 (33)	TP29.529x28.729x0.775	5.000	0.000	0.0	70.731	-25.659	4137.790	0.006
L34	14.25 - 14 (34)	TP29.569x29.529x0.775	0.250	0.000	0.0	70.830	-25.739	4143.550	0.006

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L35	14 - 13.75 (35)	TP29.609x29.569x0.775	0.250	0.000	0.0	70.928	-25.813	4149.310	0.006
L36	13.75 - 12.983 (36)	TP29.732x29.609x1.075	0.767	0.000	0.0	97.780	-26.107	5720.110	0.005
L37	12.983 - 12.817 (37)	TP29.759x29.732x0.95	0.166	0.000	0.0	86.867	-26.171	5081.720	0.005
L38	12.817 - 12.65 (38)	TP29.785x29.759x0.85	0.167	0.000	0.0	78.065	-26.228	4566.800	0.006
L39	12.65 - 12.5 (39)	TP29.809x29.785x0.85	0.150	0.000	0.0	78.130	-26.279	4570.590	0.006
L40	12.5 - 12.25 (40)	TP29.849x29.809x0.8	0.250	0.000	0.0	73.762	-26.359	4315.100	0.006
L41	12.25 - 7.25 (41)	TP30.65x29.849x0.788	5.000	0.000	0.0	74.641	-27.968	4366.510	0.006
L42	7.25 - 2.25 (42)	TP31.45x30.65x0.775	5.000	0.000	0.0	75.456	-29.600	4414.160	0.007
L43	2.25 - 0 (43)	TP31.81x31.45x0.763	2.250	0.000	0.0	75.140	-30.341	4395.710	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	108 - 103 (1)	TP8.625x8.625x0.313	11.899	56.708	0.210	0.000	56.708	0.000
L2	103 - 98.5 (2)	TP8.625x8.625x0.313	30.455	56.708	0.537	0.000	56.708	0.000
L3	98.5 - 98 (3)	TP16.5x16.5x0.313	32.551	214.977	0.151	0.000	214.977	0.000
L4	98 - 93 (4)	TP17.3x16.5x0.188	81.004	265.442	0.305	0.000	265.442	0.000
L5	93 - 88 (5)	TP18.101x17.3x0.188	131.910	290.644	0.454	0.000	290.644	0.000
L6	88 - 83 (6)	TP18.901x18.101x0.188	184.115	313.934	0.586	0.000	313.934	0.000
L7	83 - 82.873 (7)	TP18.921x18.901x0.188	185.454	314.534	0.590	0.000	314.534	0.000
L8	82.873 - 82.623 (8)	TP18.961x18.921x0.363	188.093	601.105	0.313	0.000	601.105	0.000
L9	82.623 - 77.623 (9)	TP19.762x18.961x0.356	245.221	643.803	0.381	0.000	643.803	0.000
L10	77.623 - 76.25 (10)	TP19.981x19.762x0.356	261.911	658.600	0.398	0.000	658.600	0.000
L11	76.25 - 76 (11)	TP20.021x19.981x0.6	264.973	1072.883	0.247	0.000	1072.883	0.000
L12	76 - 75.75 (12)	TP20.061x20.021x0.456	268.043	837.542	0.320	0.000	837.542	0.000
L13	75.75 - 74.333 (13)	TP20.288x20.061x0.45	285.581	846.317	0.337	0.000	846.317	0.000
L14	74.333 - 74.083 (14)	TP20.328x20.288x0.588	288.700	1086.558	0.266	0.000	1086.558	0.000
L15	74.083 - 69.083 (15)	TP21.128x20.328x0.575	353.059	1154.817	0.306	0.000	1154.817	0.000
L16	69.083 - 64.083 (16)	TP21.929x21.128x0.55	420.407	1197.717	0.351	0.000	1197.717	0.000
L17	64.083 - 59.083 (17)	TP22.729x21.929x0.538	490.856	1263.042	0.389	0.000	1263.042	0.000
L18	59.083 - 58.083 (18)	TP22.889x22.729x0.538	505.316	1281.542	0.394	0.000	1281.542	0.000
L19	58.083 - 57.733 (19)	TP22.945x22.889x0.6	510.405	1425.825	0.358	0.000	1425.825	0.000
L20	57.733 - 57.5 (20)	TP22.982x22.945x0.6	513.802	1430.650	0.359	0.000	1430.650	0.000
L21	57.5 - 52.5 (21)	TP23.783x22.982x0.575	588.263	1476.933	0.398	0.000	1476.933	0.000
L22	52.5 - 47 (22)	TP24.663x23.783x0.575	622.753	1523.692	0.409	0.000	1523.692	0.000
L23	47 - 45.25 (23)	TP24.568x23.768x0.625	701.742	1706.500	0.411	0.000	1706.500	0.000
L24	45.25 - 40.25	TP25.368x24.568x0.613	783.733	1790.208	0.438	0.000	1790.208	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 $\frac{M_{uy}}{\phi M_{ny}}$
L25	40.25 - 38.083 (25)	TP25.715x25.368x0.613	820.159	1841.333	0.445	0.000	1841.333	0.000
L26	38.083 - 37.833 (26)	TP25.755x25.715x0.713	824.396	2123.333	0.388	0.000	2123.333	0.000
L27	37.833 - 32.833 (27)	TP26.555x25.755x0.7	910.617	2226.658	0.409	0.000	2226.658	0.000
L28	32.833 - 27.733 (28)	TP27.372x26.555x0.725	1001.450	2449.175	0.409	0.000	2449.175	0.000
L29	27.733 - 27.5 (29)	TP27.409x27.372x0.725	1005.667	2456.125	0.409	0.000	2456.125	0.000
L30	27.5 - 22.5 (30)	TP28.209x27.409x0.7	1097.583	2524.608	0.435	0.000	2524.608	0.000
L31	22.5 - 19.5 (31)	TP28.689x28.209x0.688	1153.975	2571.375	0.449	0.000	2571.375	0.000
L32	19.5 - 19.25 (32)	TP28.729x28.689x0.8	1158.717	2964.833	0.391	0.000	2964.833	0.000
L33	19.25 - 14.25 (33)	TP29.529x28.729x0.775	1254.825	3049.425	0.411	0.000	3049.425	0.000
L34	14.25 - 14 (34)	TP29.569x29.529x0.775	1259.692	3058.033	0.412	0.000	3058.033	0.000
L35	14 - 13.75 (35)	TP29.609x29.569x0.775	1264.567	3066.650	0.412	0.000	3066.650	0.000
L36	13.75 - 12.983 (36)	TP29.732x29.609x1.075	1279.567	4158.533	0.308	0.000	4158.533	0.000
L37	12.983 - 12.817 (37)	TP29.759x29.732x0.95	1282.825	3730.267	0.344	0.000	3730.267	0.000
L38	12.817 - 12.65 (38)	TP29.785x29.759x0.85	1286.100	3378.817	0.381	0.000	3378.817	0.000
L39	12.65 - 12.5 (39)	TP29.809x29.785x0.85	1289.042	3384.500	0.381	0.000	3384.500	0.000
L40	12.5 - 12.25 (40)	TP29.849x29.809x0.8	1293.958	3210.900	0.403	0.000	3210.900	0.000
L41	12.25 - 7.25 (41)	TP30.65x29.849x0.788	1392.875	3343.858	0.417	0.000	3343.858	0.000
L42	7.25 - 2.25 (42)	TP31.45x30.65x0.775	1492.867	3476.092	0.429	0.000	3476.092	0.000
L43	2.25 - 0 (43)	TP31.81x31.45x0.763	1538.183	3506.025	0.439	0.000	3506.025	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	108 - 103 (1)	TP8.625x8.625x0.313	3.899	77.119	0.051	0.144	56.361	0.003
L2	103 - 98.5 (2)	TP8.625x8.625x0.313	4.187	77.119	0.054	0.160	56.361	0.003
L3	98.5 - 98 (3)	TP16.5x16.5x0.313	4.205	150.180	0.028	0.159	213.732	0.001
L4	98 - 93 (4)	TP17.3x16.5x0.188	10.063	178.734	0.056	0.628	267.860	0.002
L5	93 - 88 (5)	TP18.101x17.3x0.188	10.345	187.092	0.055	0.926	293.499	0.003
L6	88 - 83 (6)	TP18.901x18.101x0.188	10.551	195.451	0.054	0.926	320.309	0.003
L7	83 - 82.873 (7)	TP18.921x18.901x0.188	10.550	195.663	0.054	0.925	321.006	0.003
L8	82.873 - 82.623 (8)	TP18.961x18.921x0.363	10.565	375.556	0.028	0.925	611.700	0.002
L9	82.623 - 77.623 (9)	TP19.762x18.961x0.356	12.087	385.087	0.031	0.928	654.423	0.001
L10	77.623 - 76.25 (10)	TP19.981x19.762x0.356	12.244	389.448	0.031	0.931	669.329	0.001
L11	76.25 - 76 (11)	TP20.021x19.981x0.6	12.266	649.103	0.019	0.932	1104.008	0.001
L12	76 - 75.75 (12)	TP20.061x20.021x0.456	12.296	498.259	0.025	0.932	855.467	0.001
L13	75.75 - 74.333 (13)	TP20.288x20.061x0.45	12.470	497.275	0.025	0.935	863.925	0.001

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 $\frac{T_u}{\phi T_n}$
L14	74.333 - 74.083 (14)	TP20.328x20.288x0.588	12.493	646.030	0.019	0.935	1116.850	0.001
L15	74.083 - 69.083 (15)	TP21.128x20.328x0.575	13.180	658.318	0.020	1.137	1184.950	0.001
L16	69.083 - 64.083 (16)	TP21.929x21.128x0.55	13.777	654.980	0.021	1.147	1226.283	0.001
L17	64.083 - 59.083 (17)	TP22.729x21.929x0.538	14.406	664.430	0.022	1.301	1291.267	0.001
L18	59.083 - 58.083 (18)	TP22.889x22.729x0.538	14.526	669.222	0.022	1.303	1309.958	0.001
L19	58.083 - 57.733 (19)	TP22.945x22.889x0.6	14.563	746.822	0.020	1.303	1461.433	0.001
L20	57.733 - 57.5 (20)	TP22.982x22.945x0.6	14.591	748.069	0.020	1.304	1466.317	0.001
L21	57.5 - 52.5 (21)	TP23.783x22.982x0.575	15.202	743.333	0.020	1.314	1510.758	0.001
L22	52.5 - 47 (22)	TP24.663x23.783x0.575	15.470	754.868	0.020	1.319	1558.008	0.001
L23	47 - 45.25 (23)	TP24.568x23.768x0.625	16.125	833.572	0.019	1.329	1747.842	0.001
L24	45.25 - 40.25 (24)	TP25.368x24.568x0.613	16.695	844.629	0.020	1.340	1831.142	0.001
L25	40.25 - 38.083 (25)	TP25.715x25.368x0.613	16.941	856.462	0.020	1.344	1882.808	0.001
L26	38.083 - 37.833 (26)	TP25.755x25.715x0.713	16.961	993.912	0.017	1.345	2179.750	0.001
L27	37.833 - 32.833 (27)	TP26.555x25.755x0.7	17.536	1008.160	0.017	1.355	2282.767	0.001
L28	32.833 - 27.733 (28)	TP27.372x26.555x0.725	18.102	1076.120	0.017	1.366	2511.208	0.001
L29	27.733 - 27.5 (29)	TP27.409x27.372x0.725	18.120	1077.630	0.017	1.366	2518.242	0.001
L30	27.5 - 22.5 (30)	TP28.209x27.409x0.7	18.656	1072.650	0.017	1.377	2584.117	0.001
L31	22.5 - 19.5 (31)	TP28.689x28.209x0.688	18.960	1072.360	0.018	1.386	2629.683	0.001
L32	19.5 - 19.25 (32)	TP28.729x28.689x0.8	18.977	1244.610	0.015	1.387	3044.175	0.000
L33	19.25 - 14.25 (33)	TP29.529x28.729x0.775	19.477	1241.340	0.016	1.400	3125.892	0.000
L34	14.25 - 14 (34)	TP29.569x29.529x0.775	19.492	1243.060	0.016	1.400	3134.592	0.000
L35	14 - 13.75 (35)	TP29.609x29.569x0.775	19.516	1244.790	0.016	1.400	3143.317	0.000
L36	13.75 - 12.983 (36)	TP29.732x29.609x1.075	19.599	1716.030	0.011	1.400	4306.642	0.000
L37	12.983 - 12.817 (37)	TP29.759x29.732x0.95	19.611	1524.510	0.013	1.400	3846.233	0.000
L38	12.817 - 12.65 (38)	TP29.785x29.759x0.85	19.627	1370.040	0.014	1.400	3471.708	0.000
L39	12.65 - 12.5 (39)	TP29.809x29.785x0.85	19.642	1371.180	0.014	1.400	3477.475	0.000
L40	12.5 - 12.25 (40)	TP29.849x29.809x0.8	19.667	1294.530	0.015	1.399	3293.292	0.000
L41	12.25 - 7.25 (41)	TP30.65x29.849x0.788	19.910	1309.950	0.015	1.399	3425.767	0.000
L42	7.25 - 2.25 (42)	TP31.45x30.65x0.775	20.107	1324.250	0.015	1.399	3557.392	0.000
L43	2.25 - 0 (43)	TP31.81x31.45x0.763	20.195	1318.710	0.015	1.399	3585.558	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	108 - 103 (1)	0.010	0.210	0.000	0.051	0.003	0.222 ✔	1.050	4.8.2 ✔
L2	103 - 98.5 (2)	0.010	0.537	0.000	0.054	0.003	0.551 ✔	1.050	4.8.2 ✔
L3	98.5 - 98 (3)	0.005	0.151	0.000	0.028	0.001	0.158 ✔	1.050	4.8.2 ✔
L4	98 - 93 (4)	0.015	0.305	0.000	0.056	0.002	0.323 ✔	1.050	4.8.2 ✔
L5	93 - 88 (5)	0.014	0.454	0.000	0.055	0.003	0.472 ✔	1.050	4.8.2 ✔
L6	88 - 83 (6)	0.014	0.586	0.000	0.054	0.003	0.604 ✔	1.050	4.8.2 ✔
L7	83 - 82.873 (7)	0.014	0.590	0.000	0.054	0.003	0.607 ✔	1.050	4.8.2 ✔
L8	82.873 - 82.623 (8)	0.007	0.313	0.000	0.028	0.002	0.321 ✔	1.050	4.8.2 ✔
L9	82.623 - 77.623 (9)	0.009	0.381	0.000	0.031	0.001	0.390 ✔	1.050	4.8.2 ✔
L10	77.623 - 76.25 (10)	0.009	0.398	0.000	0.031	0.001	0.407 ✔	1.050	4.8.2 ✔
L11	76.25 - 76 (11)	0.005	0.247	0.000	0.019	0.001	0.253 ✔	1.050	4.8.2 ✔
L12	76 - 75.75 (12)	0.007	0.320	0.000	0.025	0.001	0.327 ✔	1.050	4.8.2 ✔
L13	75.75 - 74.333 (13)	0.007	0.337	0.000	0.025	0.001	0.345 ✔	1.050	4.8.2 ✔
L14	74.333 - 74.083 (14)	0.005	0.266	0.000	0.019	0.001	0.271 ✔	1.050	4.8.2 ✔
L15	74.083 - 69.083 (15)	0.006	0.306	0.000	0.020	0.001	0.312 ✔	1.050	4.8.2 ✔
L16	69.083 - 64.083 (16)	0.006	0.351	0.000	0.021	0.001	0.358 ✔	1.050	4.8.2 ✔
L17	64.083 - 59.083 (17)	0.006	0.389	0.000	0.022	0.001	0.395 ✔	1.050	4.8.2 ✔
L18	59.083 - 58.083 (18)	0.006	0.394	0.000	0.022	0.001	0.401 ✔	1.050	4.8.2 ✔
L19	58.083 - 57.733 (19)	0.006	0.358	0.000	0.020	0.001	0.364 ✔	1.050	4.8.2 ✔
L20	57.733 - 57.5 (20)	0.006	0.359	0.000	0.020	0.001	0.365 ✔	1.050	4.8.2 ✔
L21	57.5 - 52.5 (21)	0.006	0.398	0.000	0.020	0.001	0.405 ✔	1.050	4.8.2 ✔
L22	52.5 - 47 (22)	0.006	0.409	0.000	0.020	0.001	0.415 ✔	1.050	4.8.2 ✔
L23	47 - 45.25 (23)	0.006	0.411	0.000	0.019	0.001	0.418 ✔	1.050	4.8.2 ✔
L24	45.25 - 40.25 (24)	0.007	0.438	0.000	0.020	0.001	0.445 ✔	1.050	4.8.2 ✔
L25	40.25 - 38.083 (25)	0.007	0.445	0.000	0.020	0.001	0.453 ✔	1.050	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L26	38.083 - 37.833 (26)	0.006	0.388	0.000	0.017	0.001	0.394 ✔	1.050	4.8.2 ✔
L27	37.833 - 32.833 (27)	0.006	0.409	0.000	0.017	0.001	0.415 ✔	1.050	4.8.2 ✔
L28	32.833 - 27.733 (28)	0.006	0.409	0.000	0.017	0.001	0.415 ✔	1.050	4.8.2 ✔
L29	27.733 - 27.5 (29)	0.006	0.409	0.000	0.017	0.001	0.416 ✔	1.050	4.8.2 ✔
L30	27.5 - 22.5 (30)	0.007	0.435	0.000	0.017	0.001	0.442 ✔	1.050	4.8.2 ✔
L31	22.5 - 19.5 (31)	0.007	0.449	0.000	0.018	0.001	0.456 ✔	1.050	4.8.2 ✔
L32	19.5 - 19.25 (32)	0.006	0.391	0.000	0.015	0.000	0.397 ✔	1.050	4.8.2 ✔
L33	19.25 - 14.25 (33)	0.006	0.411	0.000	0.016	0.000	0.418 ✔	1.050	4.8.2 ✔
L34	14.25 - 14 (34)	0.006	0.412	0.000	0.016	0.000	0.418 ✔	1.050	4.8.2 ✔
L35	14 - 13.75 (35)	0.006	0.412	0.000	0.016	0.000	0.419 ✔	1.050	4.8.2 ✔
L36	13.75 - 12.983 (36)	0.005	0.308	0.000	0.011	0.000	0.312 ✔	1.050	4.8.2 ✔
L37	12.983 - 12.817 (37)	0.005	0.344	0.000	0.013	0.000	0.349 ✔	1.050	4.8.2 ✔
L38	12.817 - 12.65 (38)	0.006	0.381	0.000	0.014	0.000	0.387 ✔	1.050	4.8.2 ✔
L39	12.65 - 12.5 (39)	0.006	0.381	0.000	0.014	0.000	0.387 ✔	1.050	4.8.2 ✔
L40	12.5 - 12.25 (40)	0.006	0.403	0.000	0.015	0.000	0.409 ✔	1.050	4.8.2 ✔
L41	12.25 - 7.25 (41)	0.006	0.417	0.000	0.015	0.000	0.423 ✔	1.050	4.8.2 ✔
L42	7.25 - 2.25 (42)	0.007	0.429	0.000	0.015	0.000	0.436 ✔	1.050	4.8.2 ✔
L43	2.25 - 0 (43)	0.007	0.439	0.000	0.015	0.000	0.446 ✔	1.050	4.8.2 ✔

Section Capacity Table

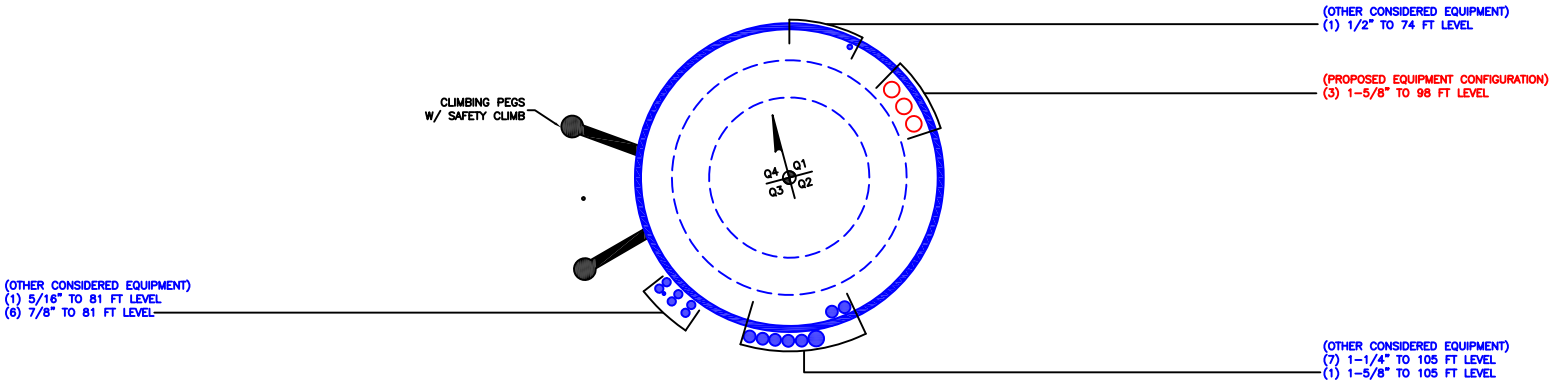
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	108 - 103	Pole	TP8.625x8.625x0.313	1	-2.454	269.918	**	**
L2	103 - 98.5	Pole	TP8.625x8.625x0.313	2	-2.672	269.918	**	**
L3	98.5 - 98	Pole	TP16.5x16.5x0.313	3	-2.711	525.629	**	**
L4	98 - 93	Pole	TP17.3x16.5x0.188	4	-8.702	625.568	**	**
L5	93 - 88	Pole	TP18.101x17.3x0.188	5	-8.977	654.823	**	**
L6	88 - 83	Pole	TP18.901x18.101x0.188	6	-9.344	684.078	**	**
L7	83 - 82.873	Pole	TP18.921x18.901x0.188	7	-9.362	684.822	**	**
L8	82.873 - 82.623	Pole	TP18.961x18.921x0.363	8	-9.387	1314.442	**	**
L9	82.623 - 77.623	Pole	TP19.762x18.961x0.356	9	-10.940	1347.801	**	**
L10	77.623 - 76.25	Pole	TP19.981x19.762x0.356	10	-11.084	1363.068	**	**

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L11	76.25 - 76	Pole	TP20.021x19.981x0.6	11	-11.134	2271.864	**	**
L12	76 - 75.75	Pole	TP20.061x20.021x0.456	12	-11.172	1743.903	**	**
L13	75.75 - 74.333	Pole	TP20.288x20.061x0.45	13	-11.384	1740.459	**	**
L14	74.333 - 74.083	Pole	TP20.328x20.288x0.588	14	-11.432	2261.101	**	**
L15	74.083 - 69.083	Pole	TP21.128x20.328x0.575	15	-12.335	2304.109	**	**
L16	69.083 - 64.083	Pole	TP21.929x21.128x0.55	16	-13.184	2292.433	**	**
L17	64.083 - 59.083	Pole	TP22.729x21.929x0.538	17	-14.052	2325.508	**	**
L18	59.083 - 58.083	Pole	TP22.889x22.729x0.538	18	-14.229	2342.277	**	**
L19	58.083 - 57.733	Pole	TP22.945x22.889x0.6	19	-14.306	2613.880	**	**
L20	57.733 - 57.5	Pole	TP22.982x22.945x0.6	20	-14.355	2618.238	**	**
L21	57.5 - 52.5	Pole	TP23.783x22.982x0.575	21	-15.377	2601.669	**	**
L22	52.5 - 47	Pole	TP24.663x23.783x0.575	22	-15.847	2642.041	**	**
L23	47 - 45.25	Pole	TP24.568x23.768x0.625	23	-17.561	2917.498	**	**
L24	45.25 - 40.25	Pole	TP25.368x24.568x0.613	24	-18.733	2956.201	**	**
L25	40.25 - 38.083	Pole	TP25.715x25.368x0.613	25	-19.246	2997.613	**	**
L26	38.083 - 37.833	Pole	TP25.755x25.715x0.713	26	-19.316	3478.692	**	**
L27	37.833 - 32.833	Pole	TP26.555x25.755x0.7	27	-20.549	3528.577	**	**
L28	32.833 - 27.733	Pole	TP27.372x26.555x0.725	28	-21.898	3766.434	**	**
L29	27.733 - 27.5	Pole	TP27.409x27.372x0.725	29	-21.968	3771.705	**	**
L30	27.5 - 22.5	Pole	TP28.209x27.409x0.7	30	-23.307	3754.264	**	**
L31	22.5 - 19.5	Pole	TP28.689x28.209x0.688	31	-24.126	3753.256	**	**
L32	19.5 - 19.25	Pole	TP28.729x28.689x0.8	32	-24.206	4356.124	**	**
L33	19.25 - 14.25	Pole	TP29.529x28.729x0.775	33	-25.659	4344.679	**	**
L34	14.25 - 14	Pole	TP29.569x29.529x0.775	34	-25.739	4350.727	**	**
L35	14 - 13.75	Pole	TP29.609x29.569x0.775	35	-25.813	4356.775	**	**
L36	13.75 - 12.983	Pole	TP29.732x29.609x1.075	36	-26.107	6006.115	**	**
L37	12.983 - 12.817	Pole	TP29.759x29.732x0.95	37	-26.171	5335.806	**	**
L38	12.817 - 12.65	Pole	TP29.785x29.759x0.85	38	-26.228	4795.140	**	**
L39	12.65 - 12.5	Pole	TP29.809x29.785x0.85	39	-26.279	4799.119	**	**
L40	12.5 - 12.25	Pole	TP29.849x29.809x0.8	40	-26.359	4530.855	**	**
L41	12.25 - 7.25	Pole	TP30.65x29.849x0.788	41	-27.968	4584.835	**	**
L42	7.25 - 2.25	Pole	TP31.45x30.65x0.775	42	-29.600	4634.868	**	**
L43	2.25 - 0	Pole	TP31.81x31.45x0.763	43	-30.341	4615.495	**	**
							Summary	
						Pole (L7)	**	**
						RATING =	**	**

**NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876363

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876363

Work Order: 2021612

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	108	9.5	0	0	8.625	8.625	0.3125		A53-B-35
2	98.5	0.5	0	0	16.50	16.5	0.3125		A53-B-35
3	98	51	3.25	18	16.50	24.663	0.1875	Auto	A607-65
4	50.25	50.25	0	18	23.77	31.81	0.25	Auto	A607-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	27.75	plate	TRI B1 5.25 x 1.25- 18	2			E1					E1										
2	0	13	plate	TRI B1A 5.25 x 1.25- 18	2													E1				E1	
3	12.75	27.75	plate	TRI B1B 5.25 x 1.25 - 18	1															E1			
4	27.75	57.75	plate	TRI B2 4.375 x 1.25 - 21	3			E1					E1							E1			
5	57.75	76.25	plate	TRI B3 4 x 1.25 - 21	3			E1					E1							E1			
6	0	13.083	channel	MP3-05 (1.1875in)	1				E2														
7	0	38.083	channel	MP3-05 (1.1875in)	2												E2						E2
8	12.917	38.083	channel	MP3-05 (1.1875in)	1						E2												
9	38.083	58.083	channel	MP3-05 (1.1875in)	2						E2												E2
10	58.083	82.873	channel	MP3-03 (1.1875in)	2						E2												E2
11	0	14	plate	CCI-SFP-045100	1									E3									
12	12.5	19.5	plate	CCI-SFP-045100	1	E3																	
13	38.083	74.333	channel	MP3-03 (1.1875in)	1												E2						
14	76	82.873	channel	MP3-03 (1.1875in)	1												E2						
15																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	5.25	1.25	6.5625	0.625	Welded	n/a	PC 8.8 - M20 (100)	24.000	18.000	4.959	1.2200	A572-65
2	5.25	1.25	6.5625	0.625	Welded	n/a	PC 8.8 - M20 (100)	30.000	18.000	4.959	1.2200	A572-65
3	5.25	1.25	6.5625	0.625	PC 8.8 - M20 (100)	30	PC 8.8 - M20 (100)	24.000	18.000	4.959	1.2200	A572-65
4	4.375	1.25	5.46875	0.625	None	n/a	PC 8.8 - M20 (100)	21.000	21.000	3.866	1.2200	A572-65
5	4	1.25	5	0.625	None	n/a	PC 8.8 - M20 (100)	21.000	21.000	3.397	1.2200	A572-65
6	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
7	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
8	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
9	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
10	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.545	1.1875	A572-65
11	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65
12	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65
13	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.545	1.1875	A572-65
14	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.545	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
TRI B1 5.25 x 1.25- 18	Top	8	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	CJP Groove	5.25	1.25	45	0.25	-	-	-
TRI B1A 5.25 x 1.25- 18	Top	10	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	CJP Groove	5.25	1.25	45	0.25	-	-	-
TRI B1B 5.25 x 1.25 - 18	Top	8	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	10	N	3	3	-	-	-	-	-	-	-	-	-
TRI B2 4.375 x 1.25 21	Top	7	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	None	-	-	-	-	-	-	-
TRI B3 4 x 1.25 - 21	Top	7	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	None	-	-	-	-	-	-	-

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	108 - 103	5		0	8.625	8.625	0.3125	A53-B-35	1.000
2	103 - 98.5	4.5	0	0	8.625	8.625	0.3125	A53-B-35	1.000
3	98.5 - 98	0.5	0	0	16.500	16.500	0.3125	A53-B-35	1.000
4	98 - 93	5		18	16.500	17.300	0.1875	A607-65	1.000
5	93 - 88	5		18	17.300	18.101	0.1875	A607-65	1.000
6	88 - 83	5		18	18.101	18.901	0.1875	A607-65	1.000
7	83 - 82.873	0.127		18	18.901	18.921	0.1875	A607-65	1.000
8	82.873 - 82.623	0.25		18	18.921	18.961	0.3625	A607-65	0.931
9	82.623 - 77.623	5		18	18.961	19.762	0.35625	A607-65	0.930
10	77.623 - 76.25	1.373		18	19.762	19.981	0.35625	A607-65	0.926
11	76.25 - 76	0.25		18	19.981	20.021	0.6	A607-65	0.962
12	76 - 75.75	0.25		18	20.021	20.061	0.45625	A607-65	1.151
13	75.75 - 74.333	1.417		18	20.061	20.288	0.45	A607-65	1.158
14	74.333 - 74.083	0.25		18	20.288	20.328	0.5875	A607-65	0.971
15	74.083 - 69.083	5		18	20.328	21.128	0.575	A607-65	0.966
16	69.083 - 64.083	5		18	21.128	21.929	0.55	A607-65	0.983
17	64.083 - 59.083	5		18	21.929	22.729	0.5375	A607-65	0.982
18	59.083 - 58.083	1		18	22.729	22.889	0.5375	A607-65	0.977
19	58.083 - 57.733	0.35		18	22.889	22.945	0.6	A607-65	1.038
20	57.733 - 57.5	0.233		18	22.945	22.982	0.6	A607-65	1.037
21	57.5 - 52.5	5		18	22.982	23.783	0.575	A607-65	1.055
22	52.5 - 50.25	5.5	3.25	18	23.783	24.663	0.575	A607-65	1.044
23	50.25 - 45.25	5		18	23.768	24.568	0.625	A607-65	1.051
24	45.25 - 40.25	5		18	24.568	25.368	0.6125	A607-65	1.051
25	40.25 - 38.083	2.167		18	25.368	25.715	0.6125	A607-65	1.042
26	38.083 - 37.833	0.25		18	25.715	25.755	0.7125	A607-65	0.946
27	37.833 - 32.833	5		18	25.755	26.555	0.7	A607-65	0.944
28	32.833 - 27.733	5.1		18	26.555	27.372	0.725	A607-65	0.948
29	27.733 - 27.5	0.233		18	27.372	27.409	0.725	A607-65	0.948
30	27.5 - 22.5	5		18	27.409	28.209	0.7	A607-65	0.962
31	22.5 - 19.5	3		18	28.209	28.689	0.6875	A607-65	0.969
32	19.5 - 19.25	0.25		18	28.689	28.729	0.8	A607-65	0.899
33	19.25 - 14.25	5		18	28.729	29.529	0.775	A607-65	0.910
34	14.25 - 14	0.25		18	29.529	29.569	0.775	A607-65	0.909
35	14 - 13.75	0.25		18	29.569	29.609	0.775	A607-65	0.908
36	13.75 - 12.983	0.767		18	29.609	29.732	1.075	A607-65	0.898
37	12.983 - 12.817	0.166		18	29.732	29.759	0.95	A607-65	0.946
38	12.817 - 12.65	0.167		18	29.759	29.785	0.85	A607-65	0.969
39	12.65 - 12.5	0.15		18	29.785	29.809	0.85	A607-65	0.968
40	12.5 - 12.25	0.25		18	29.809	29.849	0.8	A607-65	0.965
41	12.25 - 7.25	5		18	29.849	30.650	0.7875	A607-65	0.962
42	7.25 - 2.25	5		18	30.650	31.450	0.775	A607-65	0.960
43	2.25 - 0	2.25		18	31.450	31.810	0.7625	A607-65	0.968

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	108 - 103	2.45	11.90	3.90
2	103 - 98.5	2.67	30.45	4.19
3	98.5 - 98	2.71	32.55	4.20
4	98 - 93	8.70	81.00	10.06
5	93 - 88	8.98	131.91	10.34
6	88 - 83	9.34	184.12	10.55
7	83 - 82.873	9.36	185.45	10.55
8	82.873 - 82.623	9.39	188.09	10.56
9	82.623 - 77.623	10.94	245.22	12.09
10	77.623 - 76.25	11.08	261.91	12.24
11	76.25 - 76	11.13	264.97	12.27
12	76 - 75.75	11.17	268.04	12.30
13	75.75 - 74.333	11.38	285.58	12.47
14	74.333 - 74.083	11.43	288.70	12.49
15	74.083 - 69.083	12.34	353.06	13.18
16	69.083 - 64.083	13.18	420.41	13.78
17	64.083 - 59.083	14.05	490.86	14.41
18	59.083 - 58.083	14.23	505.32	14.53
19	58.083 - 57.733	14.31	510.41	14.56
20	57.733 - 57.5	14.35	513.80	14.59
21	57.5 - 52.5	15.38	588.26	15.20
22	52.5 - 50.25	15.85	622.75	15.47
23	50.25 - 45.25	17.56	701.74	16.13
24	45.25 - 40.25	18.73	783.73	16.69
25	40.25 - 38.083	19.25	820.16	16.94
26	38.083 - 37.833	19.32	824.40	16.96
27	37.833 - 32.833	20.55	910.61	17.54
28	32.833 - 27.733	21.90	1001.45	18.10
29	27.733 - 27.5	21.97	1005.67	18.12
30	27.5 - 22.5	23.31	1097.58	18.66
31	22.5 - 19.5	24.13	1153.98	18.96
32	19.5 - 19.25	24.21	1158.72	18.98
33	19.25 - 14.25	25.66	1254.82	19.48
34	14.25 - 14	25.74	1259.69	19.49
35	14 - 13.75	25.81	1264.57	19.52
36	13.75 - 12.983	26.11	1279.57	19.60
37	12.983 - 12.817	26.17	1282.82	19.61
38	12.817 - 12.65	26.23	1286.10	19.63
39	12.65 - 12.5	26.28	1289.04	19.64
40	12.5 - 12.25	26.36	1293.96	19.67
41	12.25 - 7.25	27.97	1392.88	19.91
42	7.25 - 2.25	29.60	1492.87	20.11
43	2.25 - 0	30.34	1538.18	20.19

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
108 - 103	Pole	TP8.625x8.625x0.3125	Pole	21.1%	Pass
103 - 98.5	Pole	TP8.625x8.625x0.3125	Pole	52.4%	Pass
98.5 - 98	Pole	TP16.5x16.5x0.3125	Pole	15.0%	Pass
98 - 93	Pole	TP17.3x16.5x0.1875	Pole	30.7%	Pass
93 - 88	Pole	TP18.101x17.3x0.1875	Pole	44.9%	Pass
88 - 83	Pole	TP18.901x18.101x0.1875	Pole	57.5%	Pass
83 - 82.87	Pole	TP18.921x18.901x0.1875	Pole	57.8%	Pass
82.87 - 82.62	Pole + Reinf.	TP18.961x18.921x0.3625	Reinf. 14 Tension Rupture	47.0%	Pass
82.62 - 77.62	Pole + Reinf.	TP19.762x18.961x0.3563	Reinf. 14 Tension Rupture	57.4%	Pass
77.62 - 76.25	Pole + Reinf.	TP19.981x19.762x0.3563	Reinf. 14 Tension Rupture	60.2%	Pass
76.25 - 76	Pole + Reinf.	TP20.021x19.981x0.6	Reinf. 5 Tension Rupture	42.7%	Pass
76 - 75.75	Pole + Reinf.	TP20.061x20.021x0.4563	Reinf. 5 Tension Rupture	49.6%	Pass
75.75 - 74.33	Pole + Reinf.	TP20.288x20.061x0.45	Reinf. 5 Tension Rupture	52.0%	Pass
74.33 - 74.08	Pole + Reinf.	TP20.328x20.288x0.5875	Reinf. 5 Tension Rupture	45.6%	Pass
74.08 - 69.08	Pole + Reinf.	TP21.128x20.328x0.575	Reinf. 5 Tension Rupture	53.0%	Pass
69.08 - 64.08	Pole + Reinf.	TP21.929x21.128x0.55	Reinf. 5 Tension Rupture	60.0%	Pass
64.08 - 59.08	Pole + Reinf.	TP22.729x21.929x0.5375	Reinf. 5 Tension Rupture	66.8%	Pass
59.08 - 58.08	Pole + Reinf.	TP22.889x22.729x0.5375	Reinf. 5 Tension Rupture	68.1%	Pass
58.08 - 57.73	Pole + Reinf.	TP22.945x22.889x0.6	Reinf. 4 Bolt-Shaft Bearing	62.9%	Pass
57.73 - 57.5	Pole + Reinf.	TP22.982x22.945x0.6	Reinf. 13 Tension Rupture	58.7%	Pass
57.5 - 52.5	Pole + Reinf.	TP23.783x22.982x0.575	Reinf. 13 Tension Rupture	64.2%	Pass
52.5 - 50.25	Pole + Reinf.	TP24.663x23.783x0.575	Reinf. 13 Tension Rupture	66.6%	Pass
50.25 - 45.25	Pole + Reinf.	TP24.568x23.768x0.625	Reinf. 13 Tension Rupture	65.2%	Pass
45.25 - 40.25	Pole + Reinf.	TP25.368x24.568x0.6125	Reinf. 13 Tension Rupture	69.5%	Pass
40.25 - 38.08	Pole + Reinf.	TP25.715x25.368x0.6125	Reinf. 13 Tension Rupture	71.3%	Pass
38.08 - 37.83	Pole + Reinf.	TP25.755x25.715x0.7125	Reinf. 4 Tension Rupture	65.0%	Pass
37.83 - 32.83	Pole + Reinf.	TP26.555x25.755x0.7	Reinf. 4 Tension Rupture	68.9%	Pass
32.83 - 27.73	Pole + Reinf.	TP27.372x26.555x0.725	Reinf. 1 Tension Rupture	64.2%	Pass
27.73 - 27.5	Pole + Reinf.	TP27.409x27.372x0.725	Reinf. 1 Tension Rupture	64.4%	Pass
27.5 - 22.5	Pole + Reinf.	TP28.209x27.409x0.7	Reinf. 1 Tension Rupture	67.6%	Pass
22.5 - 19.5	Pole + Reinf.	TP28.689x28.209x0.6875	Reinf. 1 Tension Rupture	69.5%	Pass
19.5 - 19.25	Pole + Reinf.	TP28.729x28.689x0.8	Reinf. 3 Tension Rupture	64.8%	Pass
19.25 - 14.25	Pole + Reinf.	TP29.529x28.729x0.775	Reinf. 3 Tension Rupture	67.7%	Pass
14.25 - 14	Pole + Reinf.	TP29.569x29.529x0.775	Reinf. 3 Tension Rupture	67.8%	Pass
14 - 13.75	Pole + Reinf.	TP29.609x29.569x0.775	Reinf. 3 Tension Rupture	68.0%	Pass
13.75 - 12.98	Pole + Reinf.	TP29.732x29.609x1.075	Reinf. 11 Tension Rupture	54.6%	Pass
12.98 - 12.82	Pole + Reinf.	TP29.759x29.732x0.95	Reinf. 1 Tension Rupture	60.8%	Pass
12.82 - 12.65	Pole + Reinf.	TP29.785x29.759x0.85	Reinf. 1 Tension Rupture	63.9%	Pass
12.65 - 12.5	Pole + Reinf.	TP29.809x29.785x0.85	Reinf. 1 Tension Rupture	64.0%	Pass
12.5 - 12.25	Pole + Reinf.	TP29.849x29.809x0.8	Reinf. 1 Tension Rupture	65.0%	Pass
12.25 - 7.25	Pole + Reinf.	TP30.65x29.849x0.7875	Reinf. 1 Tension Rupture	67.6%	Pass
7.25 - 2.25	Pole + Reinf.	TP31.45x30.65x0.775	Reinf. 1 Tension Rupture	70.0%	Pass
2.25 - 0	Pole + Reinf.	TP31.81x31.45x0.7625	Reinf. 1 Tension Rupture	71.0%	Pass
				Summary	
			Pole	57.8%	Pass
			Reinforcement	71.3%	Pass
			Overall	71.3%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*													
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
108 - 103	71	n/a	71	8.16	n/a	8.16	21.1%														
103 - 98.5	71	n/a	71	8.16	n/a	8.16	52.4%														
98.5 - 98	521	n/a	521	15.89	n/a	15.89	15.0%														
98 - 93	377	n/a	377	10.18	n/a	10.18	30.7%														
93 - 88	432	n/a	432	10.66	n/a	10.66	44.9%														
88 - 83	493	n/a	493	11.14	n/a	11.14	57.5%														
83 - 82.87	494	n/a	494	11.15	n/a	11.15	57.8%														
82.87 - 82.62	497	447	944	11.17	8.76	19.93	30.3%										47.0%				47.0%
82.62 - 77.62	564	483	1047	11.65	8.76	20.41	37.5%										57.4%				57.4%
77.62 - 76.25	583	493	1076	11.78	8.76	20.54	39.4%										60.2%				60.2%
76.25 - 76	589	1179	1768	11.80	23.76	35.56	25.7%					42.7%					35.0%				38.2%
76 - 75.75	615	790	1405	11.83	20.84	32.67	35.7%					49.6%					36.4%				
75.75 - 74.33	636	807	1443	11.96	20.84	32.80	37.5%					52.0%					38.2%				
74.33 - 74.08	617	1213	1829	11.99	23.76	35.75	27.6%					45.6%					37.4%			40.8%	
74.08 - 69.08	693	1304	1996	12.46	23.76	36.22	32.4%					53.0%					43.4%			47.3%	
69.08 - 64.08	775	1397	2173	12.94	23.76	36.70	37.2%					60.0%					49.2%			53.5%	
64.08 - 59.08	864	1518	2382	13.41	23.76	37.17	41.3%					66.8%					54.8%			59.5%	
59.08 - 58.08	883	1538	2421	13.51	23.76	37.27	42.3%					68.1%					55.8%			60.7%	
58.08 - 57.73	907	1781	2688	13.54	30.63	44.17	40.8%				62.9%					43.2%				58.5%	
57.73 - 57.5	911	1787	2698	13.57	30.63	44.19	41.0%				56.2%					43.4%				58.7%	
57.5 - 52.5	1010	1905	2915	14.04	30.63	44.67	45.4%				61.6%					47.6%				64.2%	
52.5 - 50.25	1057	1960	3016	14.26	30.63	44.88	47.4%				63.9%					49.4%				66.6%	
50.25 - 45.25	1468	2030	3498	19.30	30.63	49.92	42.8%				63.8%					49.7%				65.2%	
45.25 - 40.25	1616	2157	3773	19.93	30.63	50.56	46.1%				68.2%					53.2%				69.5%	
40.25 - 38.08	1684	2213	3897	20.21	30.63	50.83	47.5%				70.1%					54.6%				71.3%	
38.08 - 37.83	1667	2831	4497	20.24	33.36	53.59	39.3%				65.0%			57.5%	48.2%						
37.83 - 32.83	1828	2998	4826	20.87	33.36	54.23	42.0%				68.9%			60.9%	51.1%						
32.83 - 27.73	2005	3458	5462	21.52	36.64	58.16	42.6%	64.2%		60.2%				61.1%	50.2%						
27.73 - 27.5	2013	3466	5480	21.55	36.64	58.19	42.7%	64.4%		60.3%				61.2%	50.3%						
27.5 - 22.5	2196	3660	5856	22.18	36.64	58.82	45.2%	67.6%		63.4%				64.2%	52.9%						
22.5 - 19.5	2311	3778	6089	22.57	36.64	59.20	46.7%	69.5%		65.2%				66.0%	54.4%						
19.5 - 19.25	2320	4614	6934	22.60	41.14	63.73	41.3%	64.4%		64.8%				63.8%	54.9%				60.2%		
19.25 - 14.25	2521	4861	7381	23.23	41.14	64.37	43.5%	67.2%		67.7%				66.6%	57.4%				62.9%		
14.25 - 14	2531	4873	7404	23.26	41.14	64.40	43.7%	67.4%		67.8%				66.7%	57.5%				63.1%		
14 - 13.75	2541	4886	7427	23.30	41.14	64.43	43.8%	67.5%		68.0%				66.8%	57.6%				63.2%		
13.75 - 12.98	2596	7666	10262	23.39	64.41	87.81	33.0%	51.7%	49.9%	46.7%			42.3%	45.6%	43.7%			54.6%	48.0%		
12.98 - 12.82	2658	6640	9298	23.41	58.76	82.18	38.7%	60.8%	51.3%	50.8%			49.7%	45.6%				60.4%	47.7%		
12.82 - 12.65	2600	5672	8271	23.44	52.20	75.64	41.2%	63.9%	61.9%				53.3%	51.0%				61.3%	48.6%		
12.65 - 12.5	2606	5680	8287	23.45	52.20	75.65	41.3%	64.0%	62.0%				53.4%	51.0%				61.3%	48.6%		
12.5 - 12.25	2601	5315	7916	23.49	47.70	71.19	42.0%	65.0%	62.5%				55.0%	51.8%				63.3%			
12.25 - 7.25	2818	5589	8407	24.12	47.70	71.82	44.0%	67.6%	65.0%				57.2%	53.9%				65.9%			
7.25 - 2.25	3046	5870	8916	24.76	47.70	72.46	46.1%	70.0%	67.4%				59.2%	55.9%				68.3%			
2.25 - 0	3153	5999	9152	25.04	47.70	72.74	46.9%	71.0%	68.4%				60.1%	56.7%				69.3%			

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Flange Plate Connection

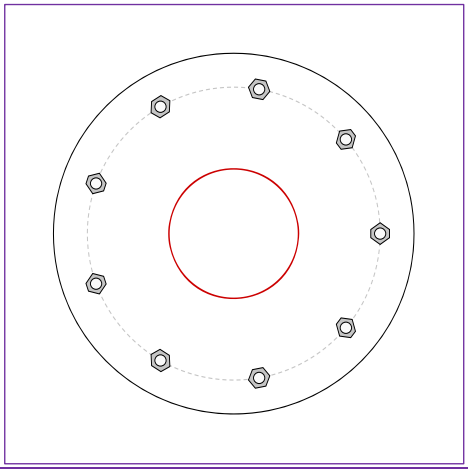
Elevation = 98 ft.

BU #	876363
Site Name	RTFORD - NU (SSUSA),
Order #	582283 Rev. 1
TIA-222 Revision	H

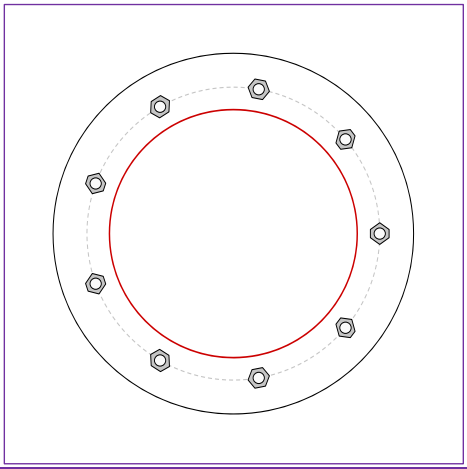
Applied Loads	
Moment (kip-ft)	32.55
Axial Force (kips)	2.71
Shear Force (kips)	4.20

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(9) 3/4" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 19.5" BC

Top Plate Data

24" OD x 1" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

24" OD x 1" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

8.625" x 0.3125" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	8.60	
Allowable (kips)	30.05	
Stress Rating:	**27.2%**	Pass

Top Plate Capacity

Max Stress (ksi):	21.72	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**46.0%**	Pass
Tension Side Stress Rating:	**54.4%**	Pass

Bottom Plate Capacity

Max Stress (ksi):	6.08	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**12.9%**	Pass
Tension Side Stress Rating:	**5.9%**	Pass

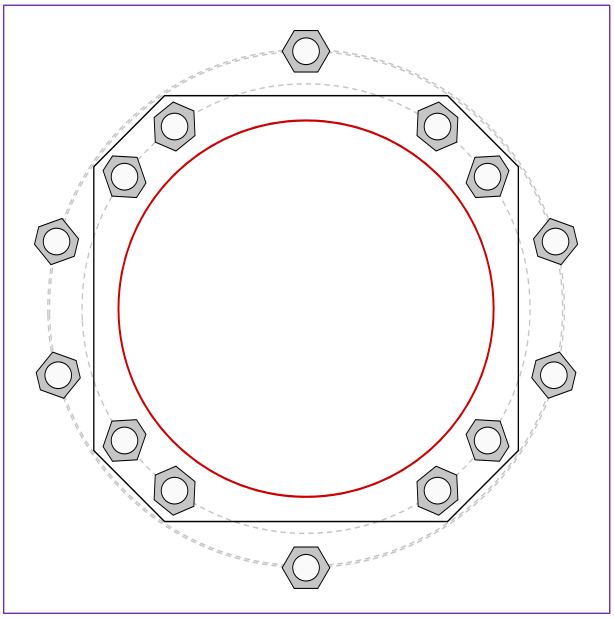
Monopole Base Plate Connection

Site Info	
BU #	876363
Site Name	RTFORD - NU (SSUSA),
Order #	582283 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	1538.18
Axial Force (kips)	30.34
Shear Force (kips)	20.19

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (8) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 38" BC
Anchor Spacing: 6 in
GROUP 2: (3) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 43.8" BC
GROUP 3: (3) 2-1/4" ø bolts (A193 Gr. B7 N; Fy=105 ksi, Fu=125 ksi) on 43.5" BC

Base Plate Data

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

Stiffener Data

N/A

Pole Data

31.81" x 0.25" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

GROUP 1:		
Pu_t = 126.07	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.52	ϕVn = 149.1	**49.3%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_t = 159.87	ϕPn_t = 243.75	**Stress Rating**
Vu = 0	ϕVn = 149.1	**62.5%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 3:		
Pu_t = 158.85	ϕPn_t = 304.69	**Stress Rating**
Vu = 0	ϕVn = 186.38	**49.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	23.78	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**45.8%**	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

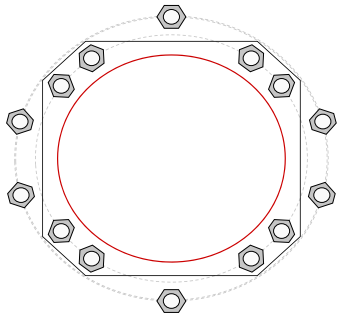
note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	
3	No	No	No	No	No	

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η:	l_{ar} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	35.91528	2.25	A615-75	38	0.5	0	N-Included		No
2	1	54.08472	2.25	A615-75	38	0.5	0	N-Included		No
3	1	125.91528	2.25	A615-75	38	0.5	0	N-Included		No
4	1	144.08472	2.25	A615-75	38	0.5	0	N-Included		No
5	1	215.91528	2.25	A615-75	38	0.5	0	N-Included		No
6	1	234.08472	2.25	A615-75	38	0.5	0	N-Included		No
7	1	305.91528	2.25	A615-75	38	0.5	0	N-Included		No
8	1	324.08472	2.25	A615-75	38	0.5	0	N-Included		No
9	2	15	2.25	A615-75	43.8	0.5	0	N-Included		No
10	2	165	2.25	A615-75	43.8	0.5	0	N-Included		No
11	2	270	2.25	A615-75	43.8	0.5	0	N-Included		No
12	3	90	2.25	A193 Gr. B7	43.5	0.5	0	N-Included		No
13	3	195	2.25	A193 Gr. B7	43.5	0.5	0	N-Included		No
14	3	345	2.25	A193 Gr. B7	43.5	0.5	0	N-Included		No

Plot Graphic



PROJECT	**85565.013.01 - HARTFORD - NU (SSUSA), CT**
SUBJECT	**Anchor Rod Bracket Analysis**
DATE	**11/01/21**
v4.6.1	

TIA-222 Rev.	H	
Apply TIA-222-H Section 15.5?	Yes	

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Analysis Criteria		
Design/Analysis	Analysis	
Load Type	Current Load	
Current load	159.87	kips
AR Capacity	268.4	kips

Tower Type	Monopole	

Manufacturers Tower Prop.		
Pole Thickness	0.25	in
Pole Grade	A572-65	
Fy	65	ksi
Fu	80	ksi
Base Plate Gr.	Custom	
Fy	55	ksi
Fu	70	ksi

Post-Installed Adhesive AR Mod.		
ARB Type	Welded	
Size	2.25	in
Grade	A615-75	
Fy	75	ksi
Fu	100	ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	37.5%	-
Tube Compression	56.2%	-
Gusset Shear	8.1%	-
Gusset Flexure	N/A	-
Welds: Gusset to Tower and BP	55.2%	-
Welds: Gusset to Tube	32.6%	-
Welds: Geometry	N/A	
Tower Punching	13.2%	-
Tube Punching	3.7%	-
Utilization	**56.2%**	

Bracket Properties

Gusset		
Thickness	1.25	in
Width at Tube	4	in
Height at Pole	48	in
Height at Tube	42	in
Grade	A572-65	
Fy	65	ksi
Fu	80	ksi

Pipe/Tube		
Size	HSS4x4x1/2	
Total Length	12	in
Length above Gusset	0	in
Length below Gusset	-30	in
Grade	A500 Grade C (Square)	
Fy	50	ksi
Fu	62	ksi

Weld - Gusset to Pipe/Tube		
FEXX	70	ksi
Weld Type	PJP - Double Bevel	
Fillet Size	1/4	in
Bevel Depth	1/4	in

Weld - Gusset to Tower		
FEXX	70	ksi
Weld Type	Double Fillet	
Fillet Size	5/16	in

Weld - Gusset to Base Plate		
FEXX	70	ksi
Weld Type	CJP - Double Bevel	
Fillet Size	9/16	in
Bevel Depth	9/16	in
Gap	0	in
Notch (horiz)	0.75	in
Notch (vert)	0.75	in
Pipe/Tube Welded to Base/Footpad?	Yes	
Fillet Size	1/2	in

PROJECT	**85565.013.01 - HARTFORD - NU (SSUSA), CT**
SUBJECT	**Anchor Rod Bracket Analysis**
DATE	**11/01/21**
v4.6.1	

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1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

TIA-222 Rev. H
Apply TIA-222-H Section 15.5? Yes

Analysis Criteria		
Design/Analysis	Analysis	
Load Type	Current Load	
Current load	159.87	kips
AR Capacity	268.4	kips

Tower Type	Monopole

Manufacturers Tower Prop.		
Pole Thickness	0.25	in
Pole Grade	A572-65	
Fy	65	ksi
Fu	80	ksi
Base Plate Gr.	Custom	
Fy	55	ksi
Fu	70	ksi

Post-Installed Adhesive AR Mod.		
ARB Type	Welded	
Size	2.25	in
Grade	A615-75	
Fy	75	ksi
Fu	100	ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	37.5%	-
Tube Compression	56.2%	-
Gusset Shear	13.0%	-
Gusset Flexure	N/A	-
Welds: Gusset to Tower and BP	55.2%	-
Welds: Gusset to Tube	52.7%	-
Welds: Geometry	N/A	
Tower Punching	29.7%	-
Tube Punching	9.7%	-
Utilization	**56.2%**	

Bracket Properties

Gusset		
Thickness	1.25	in
Width at Tube	4	in
Height at Pole	32	in
Height at Tube	26	in
Grade	A572-65	
Fy	65	ksi
Fu	80	ksi

Pipe/Tube		
Size	HSS4x4x1/2	
Total Length	12	in
Length above Gusset	0	in
Length below Gusset	-14	in
Grade	A500 Grade C (Square)	
Fy	50	ksi
Fu	62	ksi

Weld - Gusset to Pipe/Tube		
FEXX	70	ksi
Weld Type	PJP - Double Bevel	
Fillet Size	1/4	in
Bevel Depth	1/4	in

Weld - Gusset to Tower		
FEXX	70	ksi
Weld Type	Double Fillet	
Fillet Size	5/16	in

Weld - Gusset to Base Plate		
FEXX	70	ksi
Weld Type	CJP - Double Bevel	
Fillet Size	9/16	in
Bevel Depth	9/16	in
Gap	0	in
Notch (horiz)	0.75	in
Notch (vert)	0.75	in
Pipe/Tube Welded to Base/Footpad?	Yes	
Fillet Size	1/2	in

PROJECT	**85565.013.01 - HARTFORD - NU (SSUSA), CT**
SUBJECT	**Anchor Rod Bracket Analysis**
DATE	**11/01/21**
v4.6.1	

TIA-222 Rev.	H	
Apply TIA-222-H Section 15.5?	Yes	

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Analysis Criteria		
Design/Analysis	Analysis	
Load Type	Current Load	
Current load	158.85	kips
AR Capacity	375.7	kips

Tower Type	Monopole	

Manufacturers Tower Prop.		
Pole Thickness	0.25	in
Pole Grade	A572-65	
Fy	65	ksi
Fu	80	ksi
Base Plate Gr.	Custom	
Fy	55	ksi
Fu	70	ksi

Post-Installed Adhesive AR Mod.		
ARB Type	Welded	
Size	2.25	in
Grade	A193 Gr B7	
Fy	105	ksi
Fu	125	ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	28.4%	-
Tube Compression	42.7%	-
Gusset Shear	8.0%	-
Gusset Flexure	N/A	-
Welds: Gusset to Tower and BP	58.5%	-
Welds: Gusset to Tube	32.4%	-
Welds: Geometry	N/A	
Tower Punching	12.9%	-
Tube Punching	4.6%	-
Utilization	**58.5%**	

Bracket Properties

Gusset		
Thickness	1.25	in
Width at Tube	3.375	in
Height at Pole	48	in
Height at Tube	42	in
Grade	A572-65	
Fy	65	ksi
Fu	80	ksi

Pipe/Tube		
Size	HSS5x5x1/2	
Total Length	12	in
Length above Gusset	0	in
Length below Gusset	-30	in
Grade	A500 Grade C (Square)	
Fy	50	ksi
Fu	62	ksi

Weld - Gusset to Pipe/Tube		
FEXX	70	ksi
Weld Type	PJP - Double Bevel	
Fillet Size	1/4	in
Bevel Depth	1/4	in

Weld - Gusset to Tower		
FEXX	70	ksi
Weld Type	Double Fillet	
Fillet Size	5/16	in

Weld - Gusset to Base Plate		
FEXX	70	ksi
Weld Type	CJP - Double Bevel	
Fillet Size	9/16	in
Bevel Depth	9/16	in
Gap	0	in
Notch (horiz)	0.75	in
Notch (vert)	0.75	in
Pipe/Tube Welded to Base/Footpad?	Yes	
Fillet Size	1/2	in

PROJECT	**85565.013.01 - HARTFORD - NU (SSUSA), CT**
SUBJECT	**Anchor Rod Bracket Analysis**
DATE	**11/01/21**
v4.6.1	

TIA-222 Rev.	H	
Apply TIA-222-H Section 15.5?	Yes	

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1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Analysis Criteria		
Design/Analysis	Analysis	
Load Type	Current Load	
Current load	158.85	kips
AR Capacity	375.7	kips

Tower Type	Monopole	

Manufacturers Tower Prop.		
Pole Thickness	0.25	in
Pole Grade	A572-65	
Fy	65	ksi
Fu	80	ksi
Base Plate Gr.	Custom	
Fy	55	ksi
Fu	70	ksi

Post-Installed Adhesive AR Mod.		
ARB Type	Welded	
Size	2.25	in
Grade	A193 Gr B7	
Fy	105	ksi
Fu	125	ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	28.4%	-
Tube Compression	42.7%	-
Gusset Shear	12.9%	-
Gusset Flexure	N/A	-
Welds: Gusset to Tower and BP	58.5%	-
Welds: Gusset to Tube	52.5%	-
Welds: Geometry	N/A	
Tower Punching	28.9%	-
Tube Punching	12.0%	-
Utilization	**58.5%**	

Bracket Properties

Gusset		
Thickness	1.25	in
Width at Tube	3.375	in
Height at Pole	32	in
Height at Tube	26	in
Grade	A572-65	
Fy	65	ksi
Fu	80	ksi

Pipe/Tube		
Size	HSS5x5x1/2	
Total Length	12	in
Length above Gusset	0	in
Length below Gusset	-14	in
Grade	A500 Grade C (Square)	
Fy	50	ksi
Fu	62	ksi

Weld - Gusset to Pipe/Tube		
FEXX	70	ksi
Weld Type	PJP - Double Bevel	
Fillet Size	1/4	in
Bevel Depth	1/4	in

Weld - Gusset to Tower		
FEXX	70	ksi
Weld Type	Double Fillet	
Fillet Size	5/16	in

Weld - Gusset to Base Plate		
FEXX	70	ksi
Weld Type	CJP - Double Bevel	
Fillet Size	9/16	in
Bevel Depth	9/16	in
Gap	0	in
Notch (horiz)	0.75	in
Notch (vert)	0.75	in
Pipe/Tube Welded to Base/Footpad?	Yes	
Fillet Size	1/2	in

Pier and Pad Foundation

BU # :	876363
Site Name:	HARTFORD - NU (
App. Number:	582283 Rev. 1

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	30	kips
Base Shear, Vu_comp:	20	kips
Moment, M_u:	1538	ft-kips
Tower Height, **H**:	108	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	5	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	12	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	7	ft
Pad Width, W_1:	21.5	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	22	
Pad Clear Cover, cc_{pad}:	4	in

Material Properties

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

Soil Properties

Total Soil Unit Weight, γ:	100	pcf
Ultimate Gross Bearing, Qult:	6.900	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.35	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	10	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	182.93	20.00	**10.4%**	**Pass**
Bearing Pressure (ksf)	5.18	1.81	**33.4%**	**Pass**
*Overturning (kip*ft)*	3742.17	1693.00	**45.2%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	2025.65	1628.00	**76.5%**	**Pass**
Pier Compression (kip)	11934.00	50.25	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	2323.42	617.08	**25.3%**	**Pass**
Pad Shear - 1-way (kips)	646.50	102.29	**15.1%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.027	**15.4%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	2993.58	976.80	**31.1%**	**Pass**

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

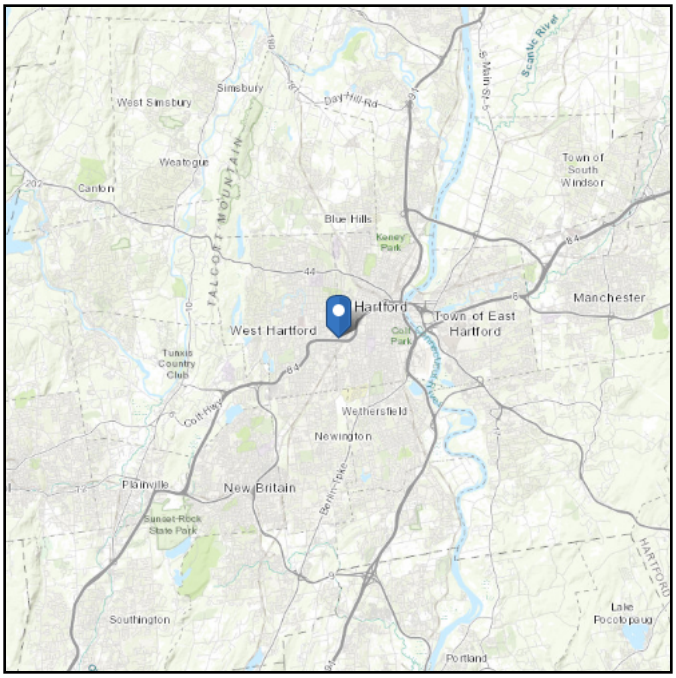
Structural Rating*:	**76.5%**
Soil Rating*:	**45.2%**

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 71.06 ft (NAVD 88)
Latitude: 41.750775
Longitude: -72.713675



Wind

Results:

Wind Speed:	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Sat Oct 30 2021

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 in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

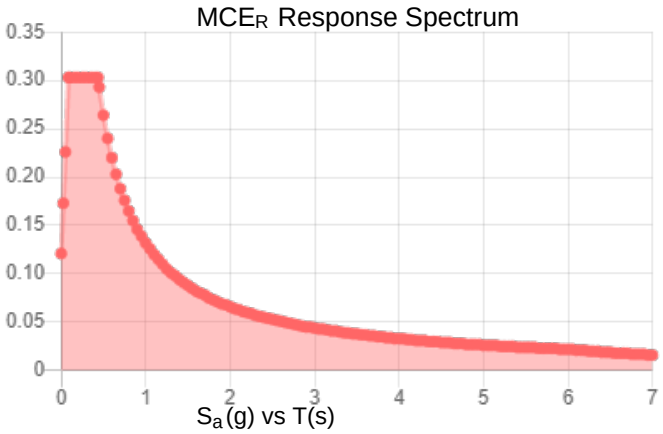
Seismic

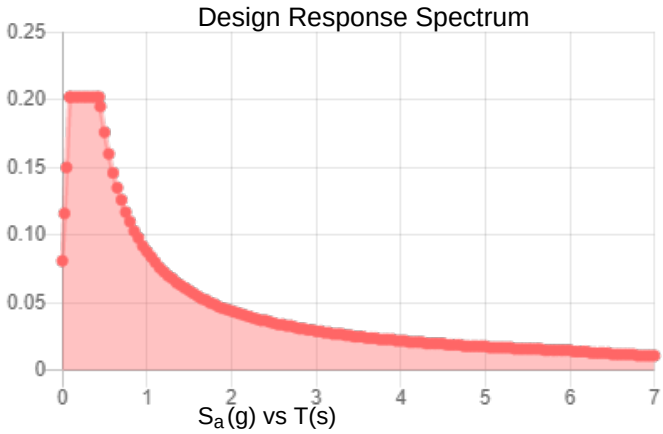
Site Soil Class: D - Default (see Section 11.4.3)

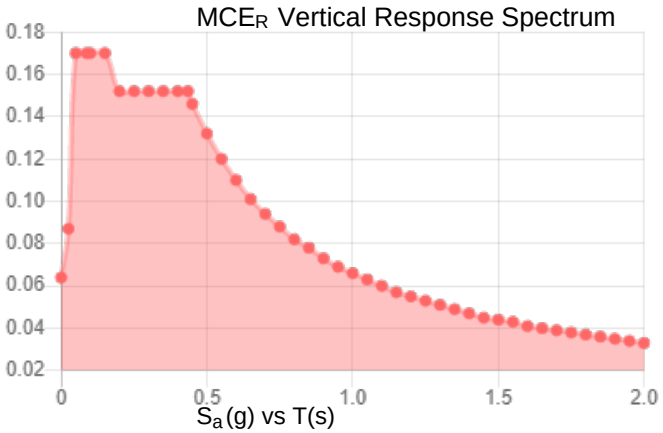
Results:

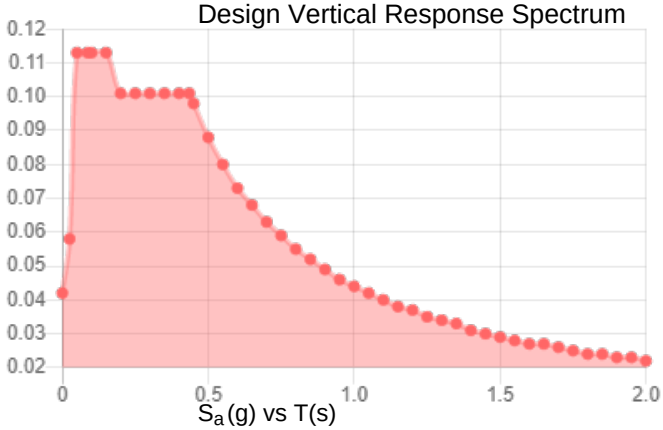
S_S :	0.189	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.102
F_v :	2.4	PGA_M :	0.163
S_{MS} :	0.303	F_{PGA} :	1.596
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.202	C_v :	0.7

Seismic Design Category B









Data Accessed: Sat Oct 30 2021

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:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sat Oct 30 2021

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.

Date: **October 28, 2021**

Jacob Montoya
Crown Castle
2055 S. Stearman Dr,
Chandler, AZ 85286
480-298-9641

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Modification Report**	
Carrier Designation:	**T-Mobile Keep**	
	Carrier Site Number:	CTHA812A
	Carrier Site Name:	CT23XC550
Crown Castle Designation:	**Crown Castle BU Number:**	876363
	Crown Castle Site Name:	HARTFORD – NU (SSUSA)
	Crown Castle JDE Job Number:	682275
	Crown Castle Order Number:	582283 Rev. 1
Engineering Firm Designation:	**Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B	
Site Data:	**219 New Park Rd, Hartford, Hartford County, CT, 06106-2949** **Latitude 41°45'2.79" Longitude -72°42'49.23"**	
Structure Information:	**Tower Height & Type:**	**108.0 ft Monopole**
	Mount Elevation:	**98.0 ft**
	Mount Type:	**14.0 ft Platform**

Dear Jacob Montoya,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Modification 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.

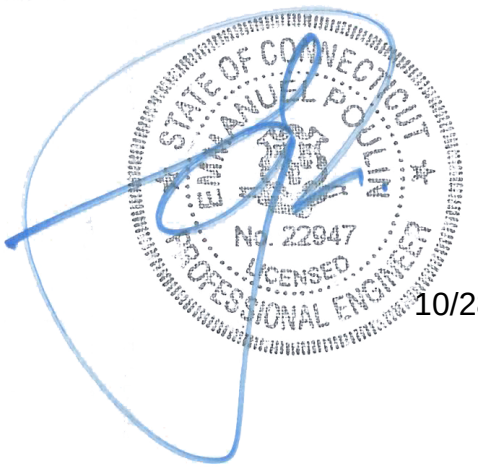
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Alex Mercado, E.I.T.

Respectfully Submitted by:
Emmanuel Poulin, P.E.
518-690-0790
structural@infinigy.com
CT PE License No. 22947



10/28/21

TABLE OF CONTENTS

1) INTRODUCTION

This is an existing 3 sector 14.0 ft Platform**.**

Proposed modifications are being considered in the analysis per Engineering detail drawings provided in Appendix E – Mount Modification Design Drawings.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	117 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.181
Seismic S_1:	0.064
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
98.0	99.0	3	ERICSSON	AIR64449 B41_T-MOBILE	14.0 ft Platform
		3	RFS/CELWAVE	APXVAALL24_43-U-NA_TMO	
		3	COMMSCOPE	VV-65A-R1_TMO	
		3	ERICSSON	RADIO 4460 B2/B25 B66_TMO	
		3	ERICSSON	RADIO 4480_TMOV2	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	582283 Rev.1	CCI Sites
Loading Documents	T-Mobile	RFDS Version 1	TSA
Previous Mount Analysis Report	Infinigy Engineering	7718811	CCI Sites
Mount Modification Drawings	Infinigy Engeering, PLLC	Appendix E	Infinigy

3.1) Analysis Method

RISA-3D (Version 17.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool V2.1.7, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

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

3.2) Assumptions

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

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

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

4) ANALYSIS RESULTS

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

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2,3	Mount Pipe(s)	MP7	98.0	51.9	Pass
	Horizontal(s)	HOR1		73.1	Pass
	Standoff(s)	S3		41.6	Pass
	Proposed Horizontal(s)	HR2		41.4	Pass
	Kicker(s)	M56		31.5	Pass
	Mount Connection(s)	--		27.9	Pass

Structure Rating (max from all components) =	73.1%

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 detailed mount connection calculations.
3) All sectors are typical

4.1) Recommendations

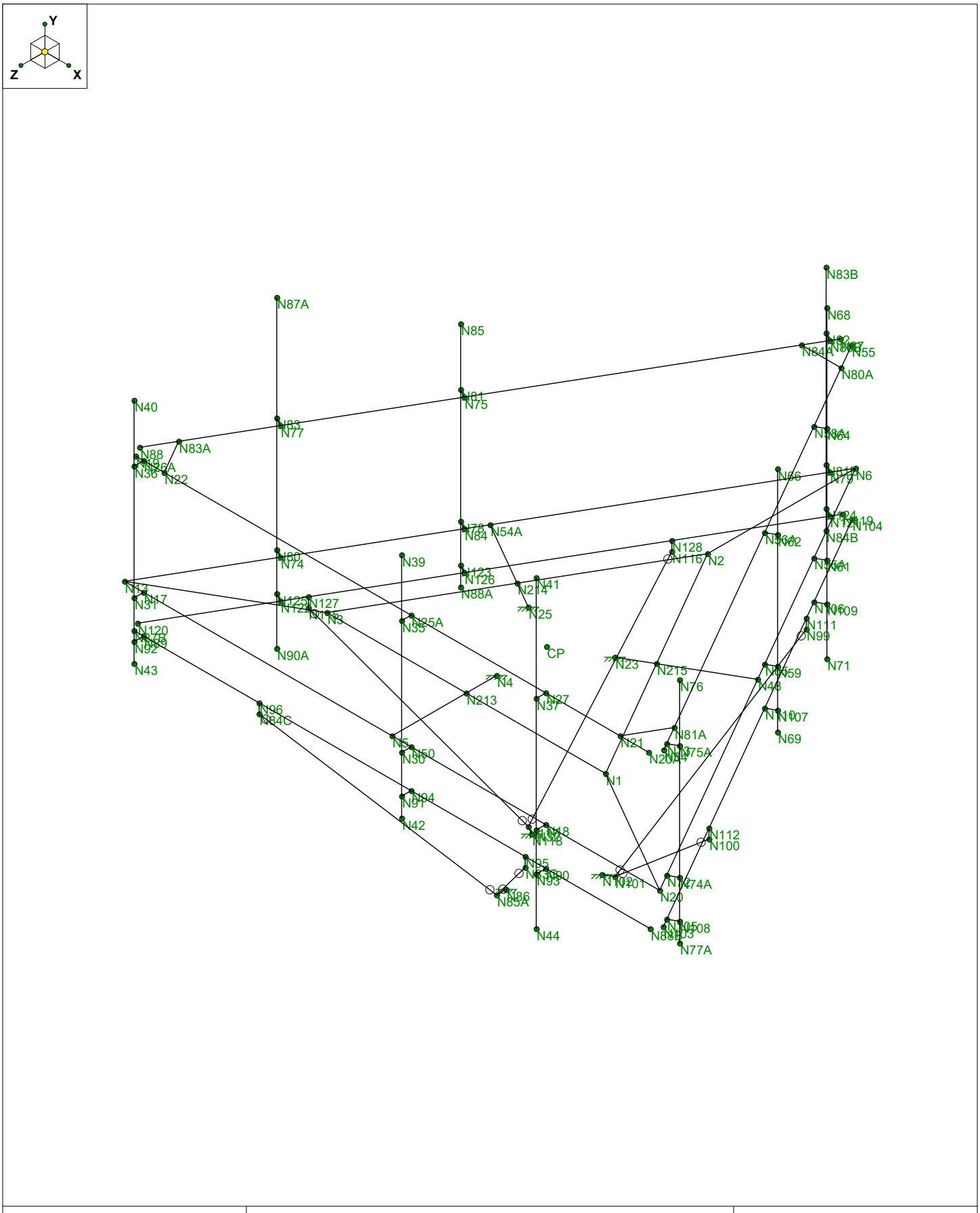
The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Installation of (1) Site Pro 1 PRK-SFS-L Platform Reinforcement Kit.
2. Installation of (1) 2.0 STD 13.5’ long horizontal pipe with (3) Site Pro 1 SCX1-K Crossover Plates per sector.
3. Remove (1) existing mount pipe and replace with (1) 2.0 STD 8’ long mount pipe with (1) Site Pro 1 SCX1-K Crossover Plate per sector.

Engineering detail drawings have been provided in Appendix E – Mount Modification Design Drawings. Connection from the mount to the tower and local stresses on the tower are sufficient.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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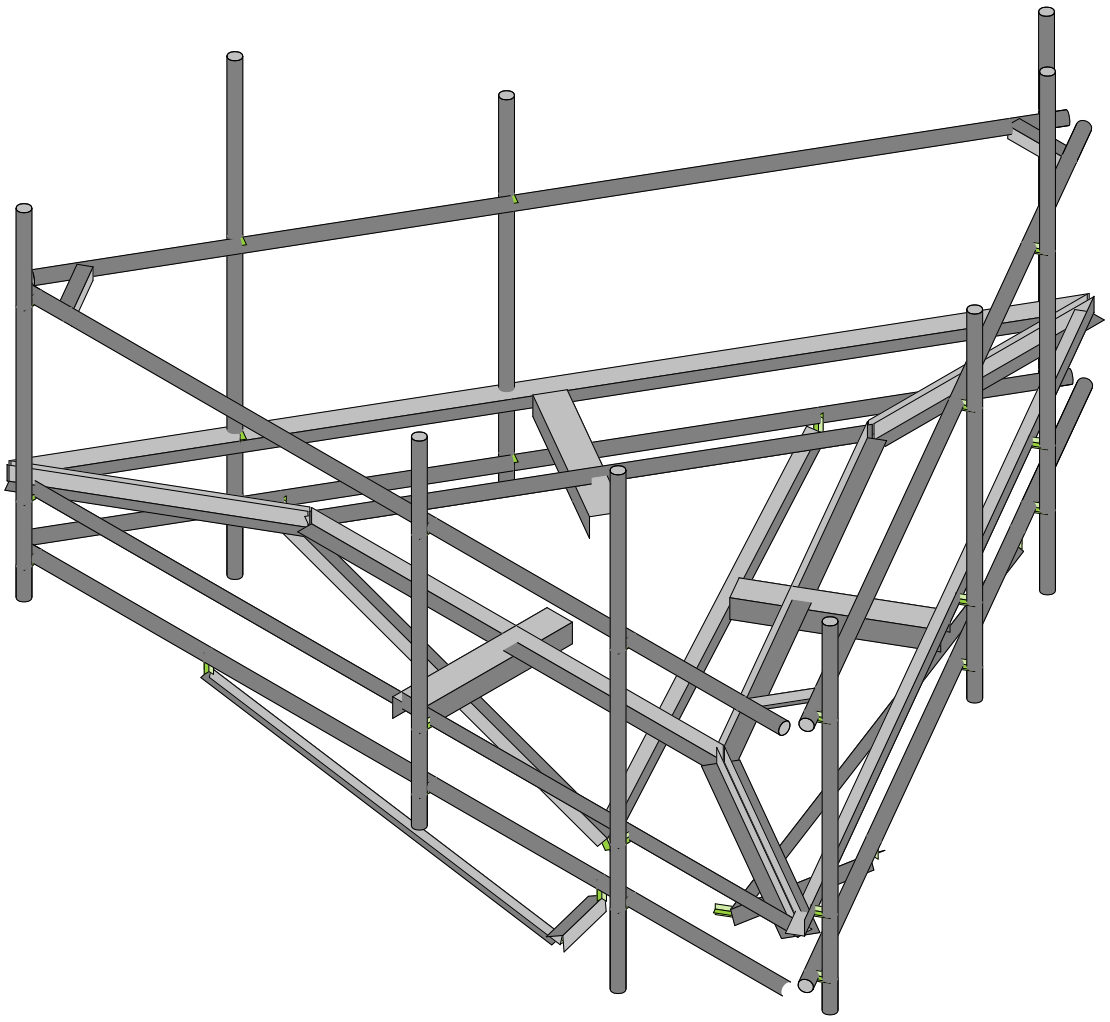

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APPENDIX B

SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION	
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	Alex Mercado

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	71.06	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	98.00	ft
Tower Height AGL:	108.00	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	0.997	*Rev H Only
Rooftop Speed-Up (K_s):	1.000	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	117	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	2	in
Flat Pressure:	83.696	psf
Round Pressure:	50.218	psf
Ice Wind Pressure:	9.171	psf

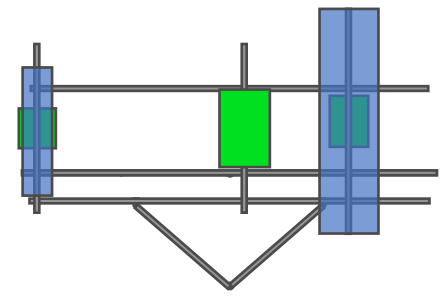
SEISMIC DATA		
Short-Period Accel. (S_s):	0.181	g
1-Second Accel. (S_1):	0.064	g
Short-Period Design (S_{DS}):	0.193	
1-Second Design (S_{D1}):	0.102	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

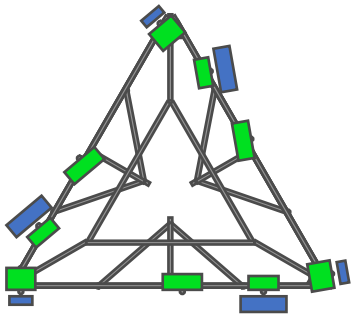
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW



INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

APPURTENANCE INFORMATION

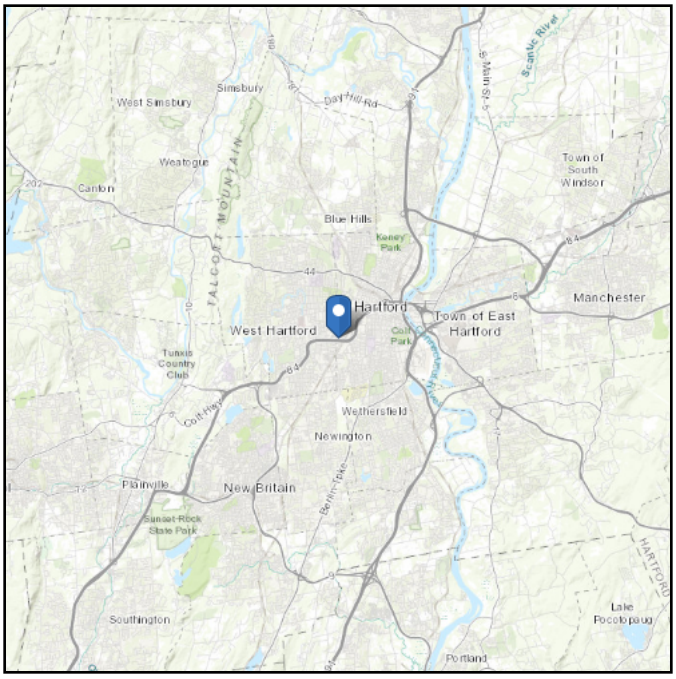
Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
COMMSCOPE VV-65A-R1_TMO	99.0	3	0.90	41.94	5.89	2.73	222.20	103.09	33.30	9.64	MP3
ERICSSON AIR6449 B41_T-MOBILE	99.0	3	0.90	41.94	5.27	2.03	198.91	76.62	114.63	33.20	MP2
/CELWAVE APXVAALL24_43-U-NA20_TI	99.0	3	0.90	41.94	14.67	5.32	553.70	200.80	149.90	43.41	MP1
RICSSON RADIO 4460 B2/B25 B66_TMC	99.0	3	0.90	41.94	2.14	1.69	80.74	63.63	109.00	31.57	MP3
ERICSSON RADIO 4480 B71_TMO	99.0	3	0.90	41.94	2.85	1.38	107.65	52.20	92.60	26.82	MP1

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 0 ft (NAVD 88)
Latitude: 41.750775
Longitude: -72.713675



Wind

Results:

Wind Speed:	117 Vmph per the State of Connecticut allowing to use ASCE-16 wind speeds
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Tue Sep 21 2021

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.

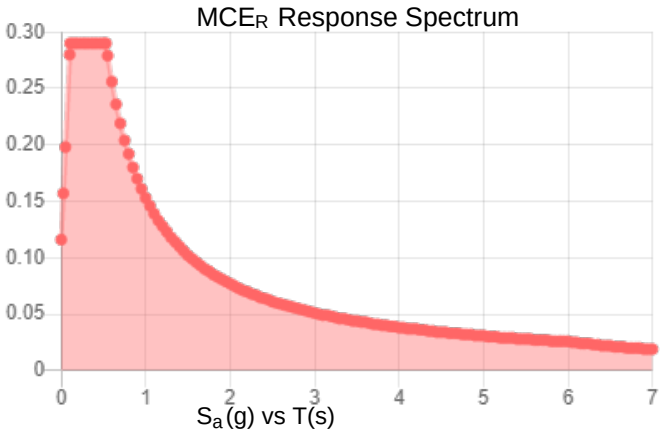
Seismic

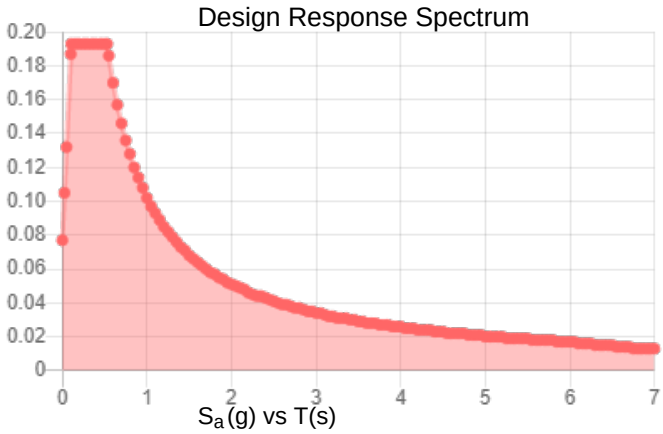
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.181	S_{DS} :	0.193
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.091
S_{MS} :	0.29	PGA_M :	0.146
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Sep 21 2021

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.

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:	Tue Sep 21 2021

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.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Ru...
1	HOR1	N13	N20		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
2	HOR2	N13	N6			Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
3	HOR3	N20	N6		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
4	G4	N3	N1			Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
5	G5	N3	N2		270	Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
6	G6	N1	N2			Grating Angle	Beam	Single Angle	A36 Gr.36	Typical
7	G3	N20	N1		180	Corner Angle	Beam	Double Angl...	A36 Gr.36	Typical
8	G2	N6	N2		180	Corner Angle	Beam	Double Angl...	A36 Gr.36	Typical
9	G1	N13	N3		180	Corner Angle	Beam	Double Angl...	A36 Gr.36	Typical
10	S1	N4	N5		90	Standoff	Beam	Channel	A36 Gr.36	Typical
11	HR1	N19	N20A			Handrail	Beam	Pipe	A53 Gr.B	Typical
12	M14	N26A	N36			RIGID	None	None	RIGID	Typical
13	M15	N17	N31			RIGID	None	None	RIGID	Typical
14	M17	N25A	N35			RIGID	None	None	RIGID	Typical
15	M21A	N27	N37			RIGID	None	None	RIGID	Typical
16	M22A	N18	N32			RIGID	None	None	RIGID	Typical
17	HR3	N54	N55			Handrail	Beam	Pipe	A53 Gr.B	Typical
18	HR2	N87	N88			Handrail	Beam	Pipe	A53 Gr.B	Typical
19	M29	N30	N50			RIGID	None	None	RIGID	Typical
20	MP1	N41	N44			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
21	MP2	N39	N42			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
22	MP3	N40	N43			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
23	S3	N23	N48		90	Standoff	Beam	Channel	A36 Gr.36	Typical
24	S2	N25	N54A		90	Standoff	Beam	Channel	A36 Gr.36	Typical
25	M33	N56A	N62			RIGID	None	None	RIGID	Typical
26	M34	N58A	N64			RIGID	None	None	RIGID	Typical
27	M35	N55A	N61			RIGID	None	None	RIGID	Typical
28	M36	N59	N65			RIGID	None	None	RIGID	Typical
29	MP7	N68	N71			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
30	MP8	N66	N69			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
31	M42	N75	N81			RIGID	None	None	RIGID	Typical
32	M43	N77	N83			RIGID	None	None	RIGID	Typical
33	M44	N74	N80			RIGID	None	None	RIGID	Typical
34	M45	N78	N84			RIGID	None	None	RIGID	Typical
35	MP4	N87A	N90A			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
36	MP5	N85	N88A			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
37	M43A	N21	N81A		90	Handrail Corner Plate	Beam	RECT	A36 Gr.36	Typical
38	M44A	N22	N83A		180	Handrail Corner Plate	Beam	RECT	A36 Gr.36	Typical
39	M45A	N84A	N80A		180	Handrail Corner Plate	Beam	RECT	A36 Gr.36	Typical
40	M40	N73	N75A			RIGID	None	None	RIGID	Typical
41	M41	N72	N74A			RIGID	None	None	RIGID	Typical
42	MP9	N76	N77A			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
43	M43B	N80B	N82			RIGID	None	None	RIGID	Typical
44	M44B	N79	N81B			RIGID	None	None	RIGID	Typical
45	MP6	N83B	N84B			2.0 STD Mount Pipe	Column	Pipe	A53 Gr.B	Typical
46	M46	N84C	N85A		90	Kicker	Beam	RECT	A36 Gr.36	Typical
47	M47	N83C	N85A		180	Kicker	Beam	RECT	A36 Gr.36	Typical
48	M48	N85A	N86			RIGID	None	None	RIGID	Typical
49	M49	N87B	N88B			New Horizontal	Beam	Pipe	A53 Gr.B	Typical
50	M50	N89	N92			RIGID	None	None	RIGID	Typical
51	M51	N90	N93			RIGID	None	None	RIGID	Typical
52	M52	N91	N94			RIGID	None	None	RIGID	Typical
53	M53	N96	N84C			RIGID	None	None	RIGID	Typical
54	M54	N95	N83C			RIGID	None	None	RIGID	Typical
55	M55	N100	N101		90	Kicker	Beam	RECT	A36 Gr.36	Typical
56	M56	N99	N101		180	Kicker	Beam	RECT	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Ru...
57	M57	N101	N102			RIGID	None	None	RIGID	Typical
58	M58	N103	N104			New Horizontal	Beam	Pipe	A53 Gr.B	Typical
59	M59	N105	N108			RIGID	None	None	RIGID	Typical
60	M60	N106	N109			RIGID	None	None	RIGID	Typical
61	M61	N107	N110			RIGID	None	None	RIGID	Typical
62	M62	N112	N100			RIGID	None	None	RIGID	Typical
63	M63	N111	N99			RIGID	None	None	RIGID	Typical
64	M64	N116	N117		90	Kicker	Beam	RECT	A36 Gr.36	Typical
65	M65	N115	N117		180	Kicker	Beam	RECT	A36 Gr.36	Typical
66	M66	N117	N118			RIGID	None	None	RIGID	Typical
67	M67	N119	N120			New Horizontal	Beam	Pipe	A53 Gr.B	Typical
68	M68	N121	N124			RIGID	None	None	RIGID	Typical
69	M69	N122	N125			RIGID	None	None	RIGID	Typical
70	M70	N123	N126			RIGID	None	None	RIGID	Typical
71	M71	N128	N116			RIGID	None	None	RIGID	Typical
72	M72	N127	N115			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		36	108	0
3	Total General		36	108	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	BPL 5.375x4x0.375	3	99	132.908
7	A36 Gr.36	L2.5x2.5x3	9	456.6	116.646
8	A36 Gr.36	L3X3X4	6	771	314.825
9	A36 Gr.36	LL3x3x4x0	3	140.3	114.575
10	A53 Gr.B	PIPE_2.0	15	1695	490.256
11	Total HR Steel		36	3161.9	1169.21

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(Plate/Wall)
1	Self Weight	DL		-1			21		3	
2	Wind Load AZI 0	WLZ					42			
3	Wind Load AZI 30	None					42			
4	Wind Load AZI 60	None					42			
5	Wind Load AZI 90	WLX					42			
6	Wind Load AZI 120	None					42			
7	Wind Load AZI 150	None					42			
8	Wind Load AZI 180	None					42			
9	Wind Load AZI 210	None					42			
10	Wind Load AZI 240	None					42			
11	Wind Load AZI 270	None					42			
12	Wind Load AZI 300	None					42			
13	Wind Load AZI 330	None					42			
14	Distr. Wind Load Z	WLZ						72		
15	Distr. Wind Load X	WLX						72		
16	Ice Weight	OL1					21	72	3	
17	Ice Wind Load AZI ...	OL2					42			
18	Ice Wind Load AZI ...	None					42			
19	Ice Wind Load AZI ...	None					42			
20	Ice Wind Load AZI ...	OL3					42			
21	Ice Wind Load AZI ...	None					42			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(Plate/Wall)
22	Ice Wind Load AZI ...	None					42			
23	Ice Wind Load AZI ...	None					42			
24	Ice Wind Load AZI ...	None					42			
25	Ice Wind Load AZI ...	None					42			
26	Ice Wind Load AZI ...	None					42			
27	Ice Wind Load AZI ...	None					42			
28	Ice Wind Load AZI ...	None					42			
29	Distr. Ice Wind Loa...	OL2						72		
30	Distr. Ice Wind Loa...	OL3						72		
31	Seismic Load Z	ELZ			-.29		21			
32	Seismic Load X	ELX	-.29				21			
33	Service Live Loads	LL				1				
34	Maintenance Load 1	LL				1				
35	Maintenance Load 2	LL				1				
36	Maintenance Load 3	LL				1				
37	Maintenance Load 4	LL				1				
38	Maintenance Load 5	LL				1				
39	Maintenance Load 6	LL				1				
40	Maintenance Load 7	LL				1				
41	Maintenance Load 8	LL				1				
42	Maintenance Load 9	LL				1				
43	BLC 1 Transient Ar...	None						99		
44	BLC 16 Transient ...	None						99		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		1	1.4																		
2	1.2DL + 1WL AZI 0	Yes	Y		1	1.2	2	1	14	1	15													
3	1.2DL + 1WL AZI 30	Yes	Y		1	1.2	3	1	14	.866	15	.5												
4	1.2DL + 1WL AZI 60	Yes	Y		1	1.2	4	1	14	.5	15	.866												
5	1.2DL + 1WL AZI 90	Yes	Y		1	1.2	5	1	14		15	1												
6	1.2DL + 1WL AZI 120	Yes	Y		1	1.2	6	1	14	-.5	15	.866												
7	1.2DL + 1WL AZI 150	Yes	Y		1	1.2	7	1	14	-.8...	15	.5												
8	1.2DL + 1WL AZI 180	Yes	Y		1	1.2	8	1	14	-1	15													
9	1.2DL + 1WL AZI 210	Yes	Y		1	1.2	9	1	14	-.8...	15	-.5												
10	1.2DL + 1WL AZI 240	Yes	Y		1	1.2	10	1	14	-.5	15	-.8...												
11	1.2DL + 1WL AZI 270	Yes	Y		1	1.2	11	1	14		15	-1												
12	1.2DL + 1WL AZI 300	Yes	Y		1	1.2	12	1	14	.5	15	-.8...												
13	1.2DL + 1WL AZI 330	Yes	Y		1	1.2	13	1	14	.866	15	-.5												
14	0.9DL + 1WL AZI 0	Yes	Y		1	.9	2	1	14	1	15													
15	0.9DL + 1WL AZI 30	Yes	Y		1	.9	3	1	14	.866	15	.5												
16	0.9DL + 1WL AZI 60	Yes	Y		1	.9	4	1	14	.5	15	.866												
17	0.9DL + 1WL AZI 90	Yes	Y		1	.9	5	1	14		15	1												
18	0.9DL + 1WL AZI 120	Yes	Y		1	.9	6	1	14	-.5	15	.866												
19	0.9DL + 1WL AZI 150	Yes	Y		1	.9	7	1	14	-.8...	15	.5												
20	0.9DL + 1WL AZI 180	Yes	Y		1	.9	8	1	14	-1	15													
21	0.9DL + 1WL AZI 210	Yes	Y		1	.9	9	1	14	-.8...	15	-.5												
22	0.9DL + 1WL AZI 240	Yes	Y		1	.9	10	1	14	-.5	15	-.8...												
23	0.9DL + 1WL AZI 270	Yes	Y		1	.9	11	1	14		15	-1												
24	0.9DL + 1WL AZI 300	Yes	Y		1	.9	12	1	14	.5	15	-.8...												
25	0.9DL + 1WL AZI 330	Yes	Y		1	.9	13	1	14	.866	15	-.5												
26	1.2D + 1.0Di	Yes	Y		1	1.2	16	1																
27	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	17	1	29	1	30											
28	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	18	1	29	.866	30	.5										
29	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	19	1	29	.5	30	.866										

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
30	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	20	1	29		30	1										
31	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	21	1	29	-.5	30	.866										
32	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	22	1	29	-.8...	30	.5										
33	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	23	1	29	-1	30											
34	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	24	1	29	-.8...	30	-.5										
35	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	25	1	29	-.5	30	-.8...										
36	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	26	1	29		30	-1										
37	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	27	1	29	.5	30	-.8...										
38	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	16	1	28	1	29	.866	30	-.5										
39	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	1	32															
40	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	.866	32	.5														
41	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	.5	32	.866														
42	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31		32	1														
43	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-.5	32	.866														
44	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-.8...	32	.5														
45	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-1	32															
46	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-.8...	32	-.5														
47	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	-.5	32	-.8...														
48	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31		32	-1														
49	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	.5	32	-.8...														
50	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.239	31	.866	32	-.5														
51	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	1	32															
52	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	.866	32	.5														
53	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	.5	32	.866														
54	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31		32	1														
55	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	-.5	32	.866														
56	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	-.8...	32	.5														
57	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	-1	32															
58	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	-.8...	32	-.5														
59	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	-.5	32	-.8...														
60	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31		32	-1														
61	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	.5	32	-.8...														
62	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.861	31	.866	32	-.5														
63	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	2	.263	14	.263	15		33	1.5										
64	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	3	.263	14	.228	15	.131	33	1.5										
65	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	4	.263	14	.131	15	.228	33	1.5										
66	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	5	.263	14		15	.263	33	1.5										
67	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	6	.263	14	-.1...	15	.228	33	1.5										
68	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	7	.263	14	-.2...	15	.131	33	1.5										
69	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	8	.263	14	-.2...	15		33	1.5										
70	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	9	.263	14	-.2...	15	-.1...	33	1.5										
71	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	10	.263	14	-.1...	15	-.2...	33	1.5										
72	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	11	.263	14		15	-.2...	33	1.5										
73	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	12	.263	14	.131	15	-.2...	33	1.5										
74	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	13	.263	14	.228	15	-.1...	33	1.5										
75	1.2DL + 1.5LL	Yes	Y		1	1.2	33	1.5																
76	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	2	.066	14	.066	15											
77	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	3	.066	14	.057	15	.033										
78	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	4	.066	14	.033	15	.057										
79	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	5	.066	14		15	.066										
80	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	6	.066	14	-.0...	15	.057										
81	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	7	.066	14	-.0...	15	.033										
82	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	8	.066	14	-.0...	15											
83	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	9	.066	14	-.0...	15	-.0...										
84	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	10	.066	14	-.0...	15	-.0...										
85	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	11	.066	14		15	-.0...										
86	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	12	.066	14	.033	15	-.0...										

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
87	1.2DL + 1.5LM-MP1 + ...	Yes	Y		1	1.2	34	1.5	13	.066	14	.057	15	-.0...										
88	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	2	.066	14	.066	15											
89	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	3	.066	14	.057	15	.033										
90	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	4	.066	14	.033	15	.057										
91	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	5	.066	14		15	.066										
92	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	6	.066	14	-.0...	15	.057										
93	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	7	.066	14	-.0...	15	.033										
94	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	8	.066	14	-.0...	15											
95	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	9	.066	14	-.0...	15	-.0...										
96	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	10	.066	14	-.0...	15	-.0...										
97	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	11	.066	14		15	-.0...										
98	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	12	.066	14	.033	15	-.0...										
99	1.2DL + 1.5LM-MP2 + ...	Yes	Y		1	1.2	35	1.5	13	.066	14	.057	15	-.0...										
100	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	2	.066	14	.066	15											
101	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	3	.066	14	.057	15	.033										
102	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	4	.066	14	.033	15	.057										
103	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	5	.066	14		15	.066										
104	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	6	.066	14	-.0...	15	.057										
105	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	7	.066	14	-.0...	15	.033										
106	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	8	.066	14	-.0...	15											
107	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	9	.066	14	-.0...	15	-.0...										
108	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	10	.066	14	-.0...	15	-.0...										
109	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	11	.066	14		15	-.0...										
110	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	12	.066	14	.033	15	-.0...										
111	1.2DL + 1.5LM-MP3 + ...	Yes	Y		1	1.2	36	1.5	13	.066	14	.057	15	-.0...										
112	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	2	.066	14	.066	15											
113	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	3	.066	14	.057	15	.033										
114	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	4	.066	14	.033	15	.057										
115	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	5	.066	14		15	.066										
116	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	6	.066	14	-.0...	15	.057										
117	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	7	.066	14	-.0...	15	.033										
118	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	8	.066	14	-.0...	15											
119	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	9	.066	14	-.0...	15	-.0...										
120	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	10	.066	14	-.0...	15	-.0...										
121	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	11	.066	14		15	-.0...										
122	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	12	.066	14	.033	15	-.0...										
123	1.2DL + 1.5LM-MP4 + ...	Yes	Y		1	1.2	37	1.5	13	.066	14	.057	15	-.0...										
124	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	2	.066	14	.066	15											
125	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	3	.066	14	.057	15	.033										
126	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	4	.066	14	.033	15	.057										
127	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	5	.066	14		15	.066										
128	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	6	.066	14	-.0...	15	.057										
129	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	7	.066	14	-.0...	15	.033										
130	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	8	.066	14	-.0...	15											
131	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	9	.066	14	-.0...	15	-.0...										
132	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	10	.066	14	-.0...	15	-.0...										
133	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	11	.066	14		15	-.0...										
134	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	12	.066	14	.033	15	-.0...										
135	1.2DL + 1.5LM-MP5 + ...	Yes	Y		1	1.2	38	1.5	13	.066	14	.057	15	-.0...										
136	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	2	.066	14	.066	15											
137	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	3	.066	14	.057	15	.033										
138	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	4	.066	14	.033	15	.057										
139	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	5	.066	14		15	.066										
140	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	6	.066	14	-.0...	15	.057										
141	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	7	.066	14	-.0...	15	.033										
142	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	8	.066	14	-.0...	15											
143	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	9	.066	14	-.0...	15	-.0...										

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
144	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	10	.066	14	-.0...	15	-.0...										
145	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	11	.066	14		15	-.0...										
146	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	12	.066	14	.033	15	-.0...										
147	1.2DL + 1.5LM-MP6 + ...	Yes	Y		1	1.2	39	1.5	13	.066	14	.057	15	-.0...										
148	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	2	.066	14	.066	15											
149	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	3	.066	14	.057	15	.033										
150	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	4	.066	14	.033	15	.057										
151	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	5	.066	14		15	.066										
152	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	6	.066	14	-.0...	15	.057										
153	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	7	.066	14	-.0...	15	.033										
154	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	8	.066	14	-.0...	15											
155	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	9	.066	14	-.0...	15	-.0...										
156	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	10	.066	14	-.0...	15	-.0...										
157	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	11	.066	14		15	-.0...										
158	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	12	.066	14	.033	15	-.0...										
159	1.2DL + 1.5LM-MP7 + ...	Yes	Y		1	1.2	40	1.5	13	.066	14	.057	15	-.0...										
160	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	2	.066	14	.066	15											
161	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	3	.066	14	.057	15	.033										
162	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	4	.066	14	.033	15	.057										
163	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	5	.066	14		15	.066										
164	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	6	.066	14	-.0...	15	.057										
165	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	7	.066	14	-.0...	15	.033										
166	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	8	.066	14	-.0...	15											
167	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	9	.066	14	-.0...	15	-.0...										
168	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	10	.066	14	-.0...	15	-.0...										
169	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	11	.066	14		15	-.0...										
170	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	12	.066	14	.033	15	-.0...										
171	1.2DL + 1.5LM-MP8 + ...	Yes	Y		1	1.2	41	1.5	13	.066	14	.057	15	-.0...										
172	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	2	.066	14	.066	15											
173	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	3	.066	14	.057	15	.033										
174	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	4	.066	14	.033	15	.057										
175	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	5	.066	14		15	.066										
176	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	6	.066	14	-.0...	15	.057										
177	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	7	.066	14	-.0...	15	.033										
178	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	8	.066	14	-.0...	15											
179	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	9	.066	14	-.0...	15	-.0...										
180	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	10	.066	14	-.0...	15	-.0...										
181	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	11	.066	14		15	-.0...										
182	1.2DL + 1.5LM-MP9 + ...	Yes	Y		1	1.2	42	1.5	12	.066	14	.033	15	-.0...										

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	N4	max	2236.704	17	2084.585	29	1023.177	14	-367.968	22	1572.116	16	150.842	16
2		min	-2400.853	11	236.804	22	-1485.106	8	-4554.384	29	-1734.978	10	-172.012	10
3	N23	max	1717.117	16	2089.641	33	2826.662	3	2286.092	33	2473.182	22	3955.231	33
4		min	-2032.716	10	231.56	14	-2454.478	21	13.537	14	-2638.38	4	398.242	14
5	N25	max	2092.208	6	2086.224	37	2602.631	2	2273.278	37	2293.061	24	-253.616	18
6		min	-1612.692	24	249.238	18	-2514.85	20	376.267	18	-2456.295	6	-3950.645	37
7	N86	max	625.723	36	2170.915	34	1504.441	34	29.178	15	157.091	36	.485	35
8		min	-208.02	103	-115.65	15	7.352	15	-540.745	34	-52.19	103	-.139	101
9	N102	max	1005.596	37	2169.81	38	3.949	20	270.649	38	158.154	28	467.835	38
10		min	-19.159	18	-56.166	19	-1289.715	27	-7.25	19	-52.907	167	-12.397	19
11	N118	max	-63.016	23	2173.55	29	182.353	107	270.325	29	157.447	32	21.642	22
12		min	-1605.468	30	-98.565	22	-480.066	173	-12.421	22	-51.942	172	-469.126	29
13	Totals:	max	5242.687	17	12278.729	34	5544.385	2						

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
14		min	-5242.703	11	2392.11	52	-5544.38	20						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	HOR1	L3X3X4	.731	84.5	34	.391	84.5	z	27	4639..	46656	1688..	3755..		H2-1
2	HOR2	L3X3X4	.730	84.5	30	.391	84.5	y	35	4639..	46656	1688..	3755..		H2-1
3	HOR3	L3X3X4	.725	84.5	38	.389	84.5	z	31	4639..	46656	1688..	3755..		H2-1
4	M67	PIPE_2.0	.649	3.396	28	.230	123.948		31	5331..	32130	1871..	1871..		H1-..
5	M49	PIPE_2.0	.646	3.396	32	.231	123.948		35	5331..	32130	1871..	1871..		H1-..
6	M58	PIPE_2.0	.644	3.396	36	.232	123.948		27	5331..	32130	1871..	1871..		H1-..
7	M43A	L2.5x2.5x3	.563	12.5	2	.138	12.5	y	2	2765..	2919..	872....	1971..		H2-1
8	M44A	L2.5x2.5x3	.520	0	10	.145	0	z	9	2765..	2919..	872....	1971..		H2-1
9	MP7	PIPE_2.0	.519	33	11	.337	69		37	1491..	32130	1871..	1871..		H1-..
10	M45A	L2.5x2.5x3	.509	0	6	.137	0	z	5	2765..	2919..	872....	1971..		H2-1
11	MP4	PIPE_2.0	.489	69	28	.338	69		29	1491..	32130	1871..	1871..		H1-..
12	MP5	PIPE_2.0	.472	54	3	.169	54		30	2086..	32130	1871..	1871..		H1-..
13	MP2	PIPE_2.0	.468	54	9	.169	54		34	2086..	32130	1871..	1871..		H1-..
14	MP6	PIPE_2.0	.467	66	29	.183	54		28	2086..	32130	1871..	1871..		H1-..
15	MP3	PIPE_2.0	.466	66	33	.184	54		32	2086..	32130	1871..	1871..		H1-..
16	MP9	PIPE_2.0	.463	66	37	.181	54		35	2086..	32130	1871..	1871..		H1-..
17	MP1	PIPE_2.0	.458	33	8	.341	69		33	1491..	32130	1871..	1871..		H1-..
18	MP8	PIPE_2.0	.449	54	37	.167	54		38	2086..	32130	1871..	1871..		H1-..
19	S3	BPL 5.375...	.417	0	34	.110	9.281	y	4	1387...	1533..	1237..	2566..		H1-..
20	S2	BPL 5.375...	.416	0	38	.105	9.281	y	8	1387...	1533..	1237..	2566..		H1-..
21	HR2	PIPE_2.0	.414	129.938	3	.136	151.875		10	5397..	32130	1871..	1871..		H1-..
22	S1	BPL 5.375...	.403	0	30	.088	9.281	y	11	1387...	1533..	1237..	2566..		H1-..
23	HR3	PIPE_2.0	.399	129.937	11	.135	151.875		6	5397..	32130	1871..	1871..		H1-..
24	G5	L3X3X4	.358	44	31	.018	44	z	30	1437..	46656	1688..	3175..		H2-1
25	HR1	PIPE_2.0	.357	129.937	7	.145	151.875		2	5397..	32130	1871..	1871..		H1-..
26	G6	L3X3X4	.356	44	27	.018	44	y	28	1437..	46656	1688..	3174..		H2-1
27	G4	L3X3X4	.354	44	32	.018	44	y	32	1437..	46656	1688..	3181..		H2-1
28	M47	L2.5x2.5x3	.315	35.649	34	.023	0	y	35	9694..	2919..	872....	1545..		H2-1
29	M56	L2.5x2.5x3	.315	35.649	38	.023	69.843	y	27	9694..	2919..	872....	1545..		H2-1
30	M65	L2.5x2.5x3	.311	35.649	30	.023	69.843	y	32	9694..	2919..	872....	1545..		H2-1
31	M64	L2.5x2.5x3	.212	35.649	28	.014	0	z	27	9694..	2919..	872....	1545..		H2-1
32	M46	L2.5x2.5x3	.212	35.649	32	.014	69.843	z	31	9694..	2919..	872....	1545..		H2-1
33	M55	L2.5x2.5x3	.208	35.649	36	.014	69.843	z	34	9694..	2919..	872....	1545..		H2-1
34	G2	LL3x3x4x0	.123	0	5	.022	46.765	y	30	7639..	93312	6480	4361..		H1-..
35	G1	LL3x3x4x0	.122	0	9	.022	46.765	y	34	7639..	93312	6480	4361..		H1-..
36	G3	LL3x3x4x0	.122	0	2	.022	46.765	y	38	7639..	93312	6480	4361..		H1-..

APPENDIX D

ADDITIONAL CALCUATIONS

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	HARTFORD - NU (SSUSA)
Site Number:	876363
Connection Description:	Mount to Tower

MAXIMUM BOLT LOADS		
Bolt Tension:	7095.53	lbs
Bolt Shear:	9875.20	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	328.63	lbs
Bolt Shear:	9875.20	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	1	in
Bolt Grade:	A325	-
# of Bolts:	2	-
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #35 on member S3 in RISA-3D, which causes the maximum demand on the bolts.*

Member Information
I nodes of S1, S3, S2

BOLT CHECK		
Tensile Strength	54516.96	
Shear Strength	35342.92	
Max Tensile Usage	13.0%	
Max Shear Usage	27.9%	
Interaction Check (Worst Case)	0.08	***≤1.05***
Result	Pass	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Bolt Calculation Tool, V1.5.1

PROJECT DATA	
Site Name:	HARTFORD - NU (SSUSA)
Site Number:	876363
Connection Description:	Kicker to Tower

MAXIMUM BOLT LOADS		
Bolt Tension:	317.17	lbs
Bolt Shear:	563.89	lbs

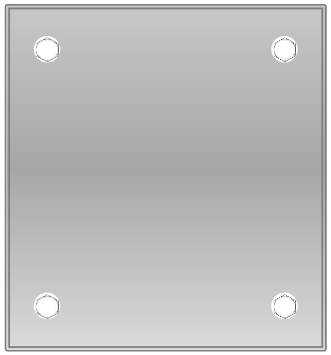
WORST CASE BOLT LOADS[1]		
Bolt Tension:	10.06	lbs
Bolt Shear:	563.89	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	0.625	in
Bolt Grade:	A325	-
# of Bolts:	4	-
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #38 on member M57 in RISA-3D, which causes the maximum demand on the bolts.*

Member Information
J nodes of M48, M57, M66

BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	13805.83	
Max Tensile Usage	1.6%	
Max Shear Usage	4.1%	
Interaction Check (Worst Case)	0.00	***≤1.05***
Result	Pass	



APPENDIX E

MOUNT MODIFICATION DESIGN DRAWINGS (MDD) / SUPPLEMENTAL DRAWINGS

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

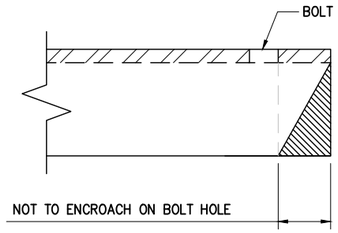
STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY200, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.
12. REMOVAL/REPLACEMENT OF STRUCTURAL MEMBERS SHALL BE DONE ONE MEMBER AT A TIME. CONTRACTOR IS RESPONSIBLE FOR ENSURING THE STRUCTURAL INTEGRITY OF THE STRUCTURE DURING ALL PHASES OF CONSTRUCTION.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



PLANS PREPARED FOR:

T-Mobile

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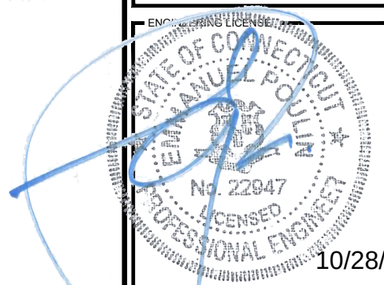
MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:



10/28/21

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	10/28/21	BE	0

SPRINT SITE #: CTHA812A

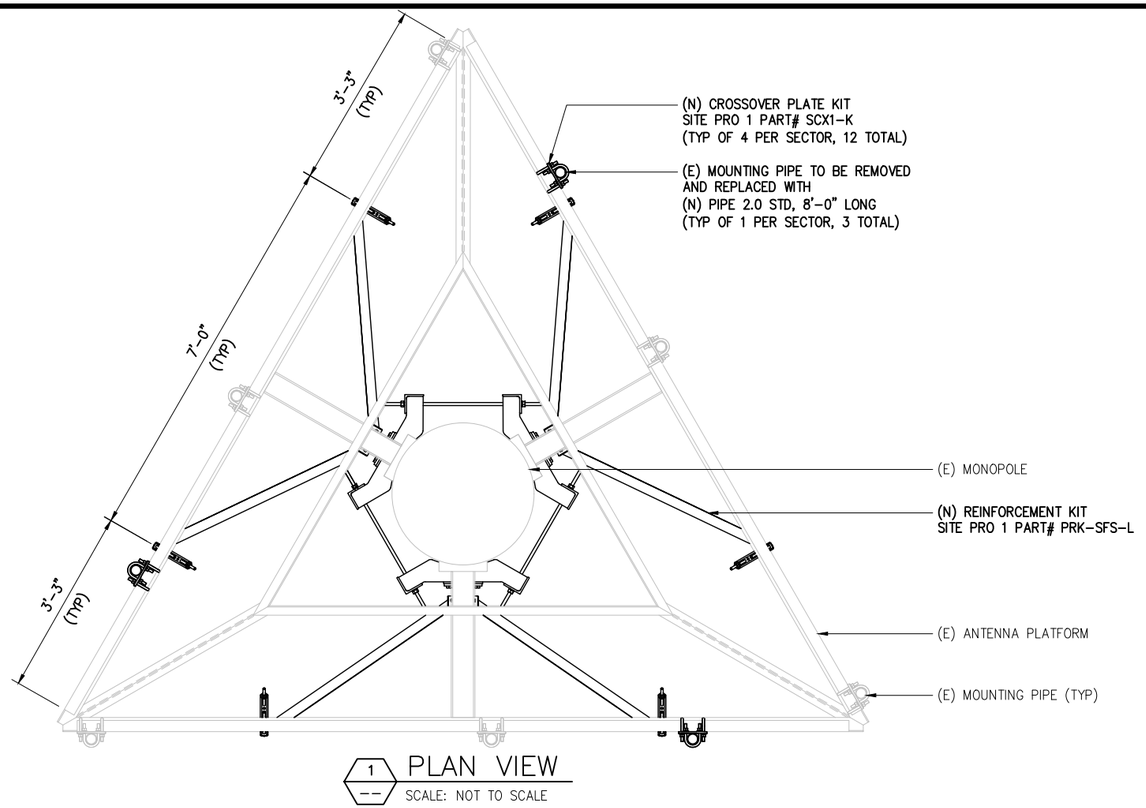
CROWN CASTLE SITE NAME: HARTFORD - NU (SSUSA)

CROWN CASTLE BU #: 876363

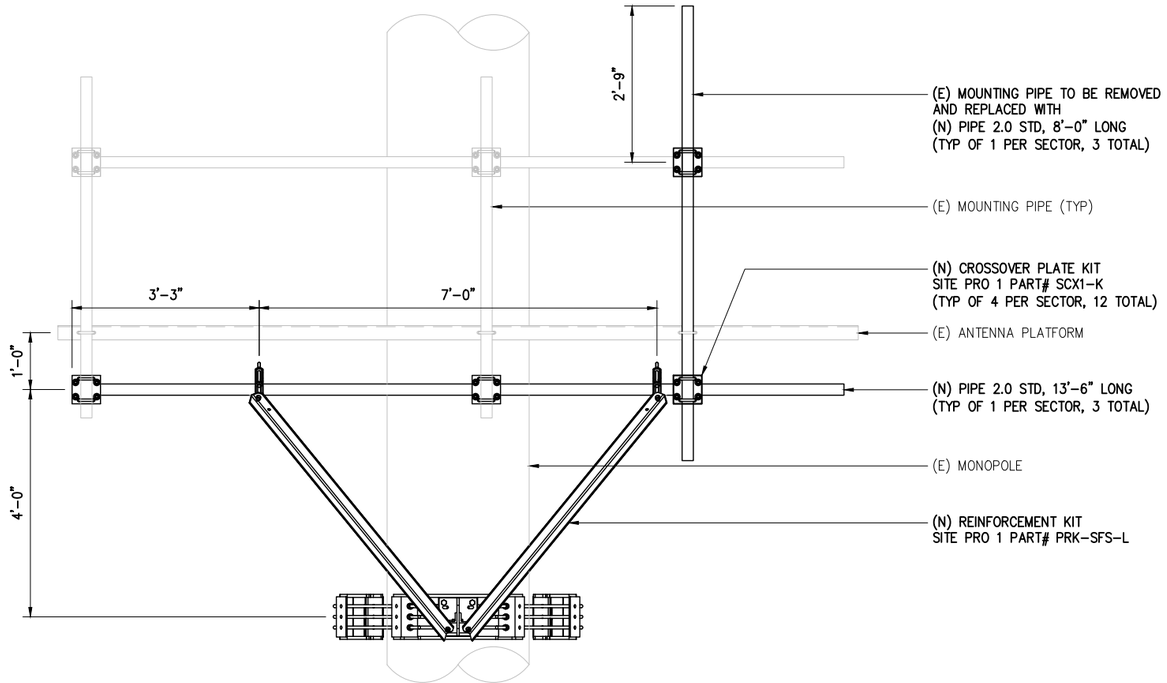
SITE ADDRESS: 219 NEW PARK ROAD HARTFORD, CT 06106-2949

SHEET DESCRIPTION: GENERAL NOTES

SHEET NUMBER: S1



1 PLAN VIEW
SCALE: NOT TO SCALE



2 ELEVATION VIEW
SCALE: NOT TO SCALE

NOTES:

1. MODIFICATIONS SHOWN ARE TYPICAL FOR ALL SECTORS.
2. ALL DESIGNATED PARTS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO FIELD VERIFY REQUIRED LENGTHS OF PROPOSED ANGLES, PIPES & PLATES, AND CUT & DRILL ON SITE AS NECESSARY.
4. REMOVAL/REPLACEMENT OF STRUCTURAL MEMBERS SHALL BE DONE ONE MEMBER AT A TIME. CONTRACTOR IS RESPONSIBLE FOR ENSURING THE STRUCTURAL INTEGRITY OF THE STRUCTURE DURING ALL PHASES OF CONSTRUCTION.

PLANS PREPARED FOR:

T-Mobile

PLANS PREPARED BY:

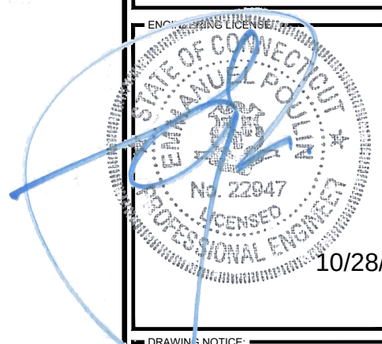
INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER: 1039-Z0001-B

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:



10/28/21

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	10/28/21	BE	0

SPRINT SITE #:

CTHA812A

CROWN CASTLE SITE NAME:

HARTFORD - NU (SSUSA)

CROWN CASTLE BU #:

876363

SITE ADDRESS:

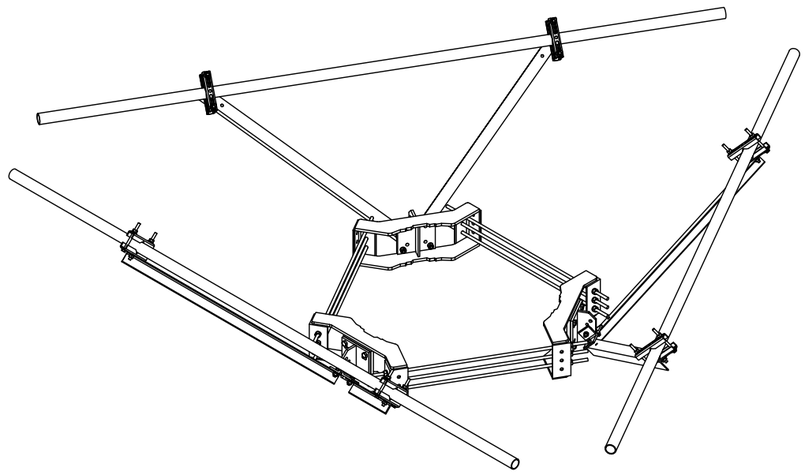
219 NEW PARK ROAD
HARTFORD, CT 06106-2949

SHEET DESCRIPTION:

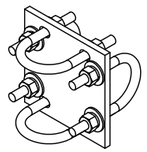
ANTENNA PLATFORM MODIFICATION

SHEET NUMBER:

S2



1 SITE PRO 1 P/N PRK-SFS-L
SCALE: NOT TO SCALE



2 SITE PRO 1 P/N SCX1-K
SCALE: NOT TO SCALE

PLANS PREPARED FOR:

T-Mobile

PLANS PREPARED BY:

INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER: 1039-Z0001-B

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSURE:

STATE OF CONNECTICUT * EMMANUEL POULIN * No. 22947 LICENSED PROFESSIONAL ENGINEER

10/28/21

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	10/28/21	BE	0

SPRINT SITE #:

CTHA812A

CROWN CASTLE SITE NAME:

HARTFORD - NU (SSUSA)

CROWN CASTLE BU #:

876363

SITE ADDRESS:

219 NEW PARK ROAD
HARTFORD, CT 06106-2949

SHEET DESCRIPTION:

REQUIRED PARTS

SHEET NUMBER:

S3

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTHA812A

876363
219 New Park Road
Hartford, Connecticut 06106

December 9, 2021

EBI Project Number: 6221007491

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**37.08%**

December 9, 2021

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA812A - 876363

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **219 New Park Road** in **Hartford, Connecticut** 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 ($\mu W/cm^2$). 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.

Public 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 MHz and 700 MHz frequency 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), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 219 New Park Road in Hartford, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

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

12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in

the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

14) The antenna mounting height centerline of the proposed antennas is 99 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A1 MPE %:	**4.11%**	Antenna B1 MPE %:	**4.11%**	Antenna C1 MPE %:	**4.11%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A2 MPE %:	**15.11%**	Antenna B2 MPE %:	**15.11%**	Antenna C2 MPE %:	**15.11%**
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.15 dBd / 15.8 dBd / 15.8 dBd	Gain:	15.15 dBd / 15.8 dBd / 15.8 dBd	Gain:	15.15 dBd / 15.8 dBd / 15.8 dBd
Height (AGL):	99 feet	Height (AGL):	99 feet	Height (AGL):	99 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	13,052.63	ERP (W):	13,052.63	ERP (W):	13,052.63
Antenna A3 MPE %:	**5.43%**	Antenna B3 MPE %:	**5.43%**	Antenna C3 MPE %:	**5.43%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	24.65%
Nextel	1.13%
Metro PCS	2.22%
Clearwire	0.2%
Verizon	8.88%
Site Total MPE % :	37.08%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	24.65%
T-Mobile Sector B Total:	24.65%
T-Mobile Sector C Total:	24.65%
Site Total MPE % :	37.08%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	99.0	4.92	600 MHz LTE	400	1.23%
T-Mobile 600 MHz NR	1	1577.94	99.0	6.56	600 MHz NR	400	1.64%
T-Mobile 700 MHz LTE	2	695.22	99.0	5.78	700 MHz LTE	467	1.24%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	99.0	45.91	2500 MHz LTE 1C & 2C Traffic	1000	4.59%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	99.0	4.46	2500 MHz LTE 1C & 2C Broadcast	1000	0.45%
T-Mobile 2500 MHz NR Traffic	1	22089.26	99.0	91.82	2500 MHz NR Traffic	1000	9.18%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	99.0	8.93	2500 MHz NR Broadcast	1000	0.89%
T-Mobile 1900 MHz GSM	4	982.02	99.0	16.33	1900 MHz GSM	1000	1.63%
T-Mobile 1900 MHz LTE	2	2281.14	99.0	18.96	1900 MHz LTE	1000	1.90%
T-Mobile 2100 MHz LTE	2	2281.14	99.0	18.96	2100 MHz LTE	1000	1.90%
						Total:	**24.65%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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:	24.65%
Sector B:	24.65%
Sector C:	24.65%
T-Mobile Maximum MPE % (Sector A):	24.65%
Site Total:	37.08%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **37.08%** 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.

T-Mobile

T-MOBILE SITE NUMBER: CTHA812A
T-MOBILE SITE NAME: 876363_HARTFORD - NU (SSUSA)
SITE TYPE: MONOPOLE
TOWER HEIGHT: 108'-0"

BUSINESS UNIT #: 876363
SITE ADDRESS: 219 NEW PARK RD. HARTFORD, CT 06106-2949
COUNTY: HARTFORD
JURISDICTION: HARTFORD COUNTY

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67E5998E_1xAIR+1OP+1QP

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	HARTFORD - NU (SSUSA)
SITE ADDRESS:	219 NEW PARK RD. HARTFORD, CT 06106-2949
COUNTY:	HARTFORD
MAP/PARCEL #:	138472001
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.75077499° (41° 45' 2.79"")
LONGITUDE:	-72.71367500° (-72° 42' 49.23")
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	62.33 FT
CURRENT ZONING:	MS-3
JURISDICTION:	HARTFORD COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	CONN LIGHT & POWER CO PO BOX 270 CT, 06141-0270
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002
ELECTRIC PROVIDER:	TBD
TELCO PROVIDER:	TBD

PROJECT TEAM

A&E FIRM:	INFINIGY 1033 WATERVLIET SHAKER RD. ALBANY, NY 12205
CROWN CASTLE USA INC. DISTRICT CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER TRICAIS.PELON@CROWNCASTLE.COM
	CHRISTOPHER P MILLER - CONSTRUCTION MANAGER CHRISP.MILLER@CROWNCASTLE.COM CONTACT : 585-739-1780

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
C-6	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

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.

PROJECT DESCRIPTION

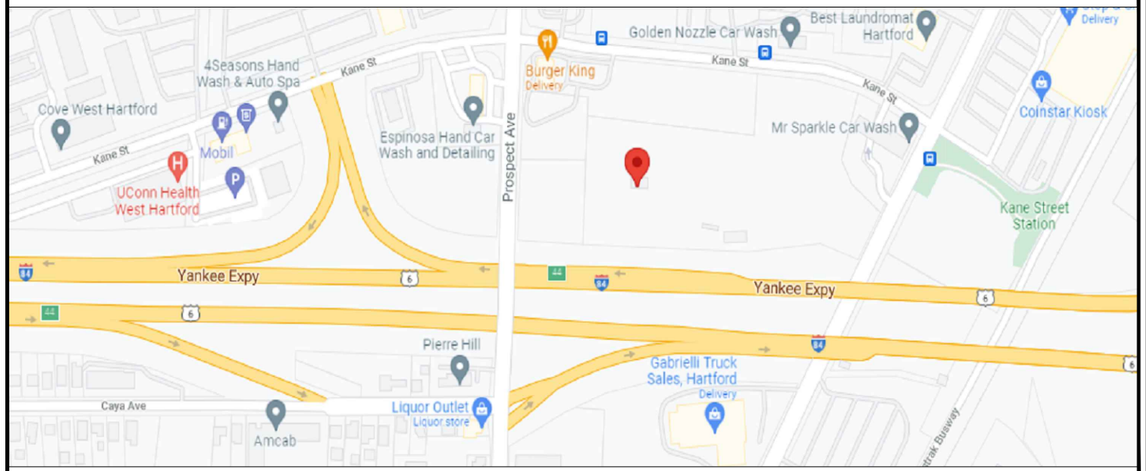
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
- REMOVE (6) RRHS
- REMOVE (6) COMBNR
- REMOVE (3) HYBRID CABLES
- INSTALL (9) ANTENNAS
- INSTALL (6) RRHS
- INSTALL (3) HYBRID CABLES
- MODIFY EXISTING PLATFORM MOUNT

GROUND SCOPE OF WORK:
- REMOVE ALL EXISTING EQUIPMENT
- INSTALL (1) 6160 & (1) B160 BATTERY CABINET
- INSTALL (1) IXRE ROUTER IN (P) CABINET
- INSTALL (1) DUG20 IN (P) CABINET
- INSTALL (3) BB6648 IN (P) CABINET

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

LOCATION MAP



NO SCALE

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
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	11/03/2021
MOUNT ANALYSIS:	INFINIGY ENGINEERING, PLLC
DATED:	10/28/2021
RFDS REVISION:	1
DATED:	10/18/2021
ORDER ID:	582283
REVISION:	1

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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.

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

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

INFINIGY
FROM ZERO TO INFINIGY
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1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

T-MOBILE SITE NUMBER:
CTHA812A

BU #: **876363**
HARTFORD - NU (SSUSA)

219 NEW PARK RD.
HARTFORD, CT 06106-2949

EXISTING 108'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/11/2021	RCD	FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

11/11/2021

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED– NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800–788–7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
   THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. 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 CED–STD–10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA–322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED–STD–10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA–1019–A–2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. 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 CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR 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 E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. 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, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. 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 CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR 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.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR 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.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. 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.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: T–MOBILE
   TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR 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.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR 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.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE–THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER–TO–CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
   #4 BARS AND SMALLER........................40 ksi
   #5 BARS AND LARGER........................60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH........3"
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 BARS AND LARGER........................2"
   #5 BARS AND SMALLER........................1–1/2"
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
   SLAB AND WALLS........................3/4"
   BEAMS AND COLUMNS........................1–1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

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 CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR 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 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 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE 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 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 RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING 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 CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., 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 BARE SOLID TINNED COPPER IN 3/4" NON–METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

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. CONTRACTOR 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.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR 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.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI–CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN–2, XHHW, XHHW–2, THW, THW–2, RHW, OR RHW–2 INSULATION 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 NOT 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), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL–CLAD CABLE (MC) 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 THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER–ACTUATED) 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 BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. 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 BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (–)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

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T-MOBILE SITE NUMBER:
CTHA812A

BU #: **876363**
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219 NEW PARK RD.
HARTFORD, CT 06106-2949

EXISTING 108'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/11/2021	RCD	FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

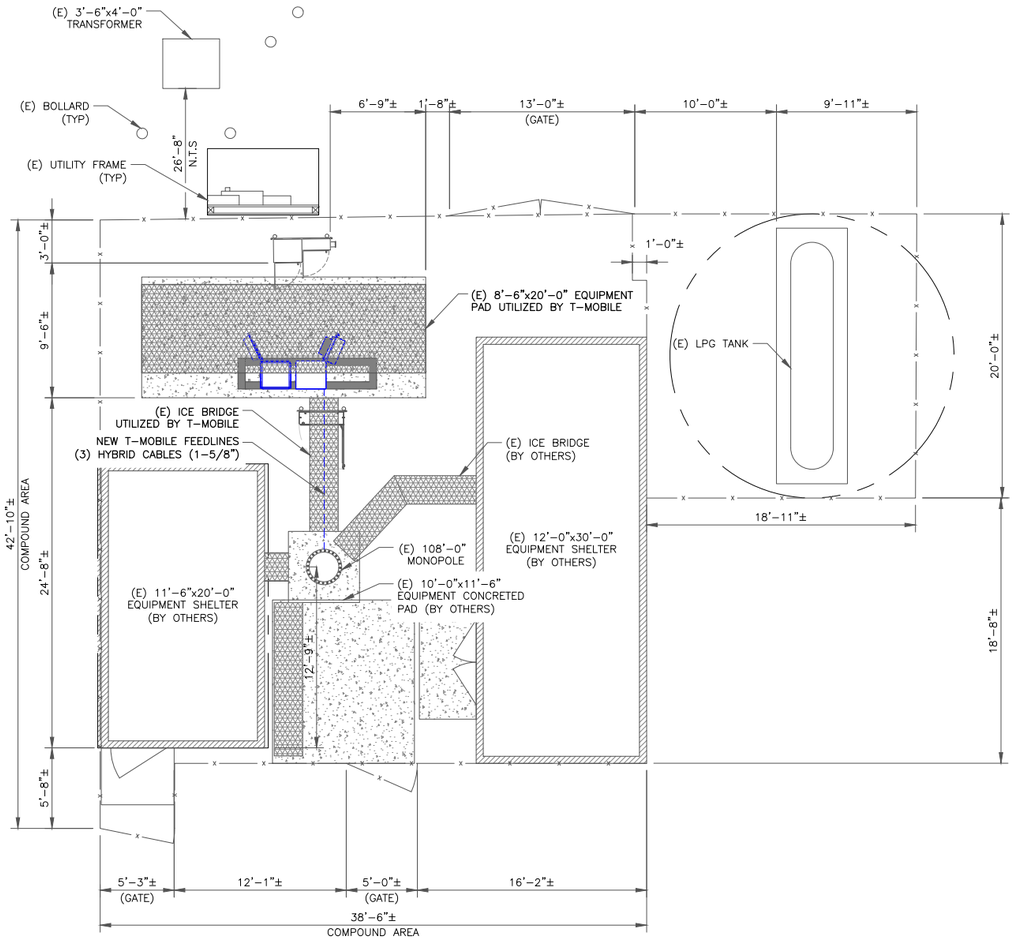
11/11/2021

SHEET NUMBER: T-2

REVISION: 0

NOTE:

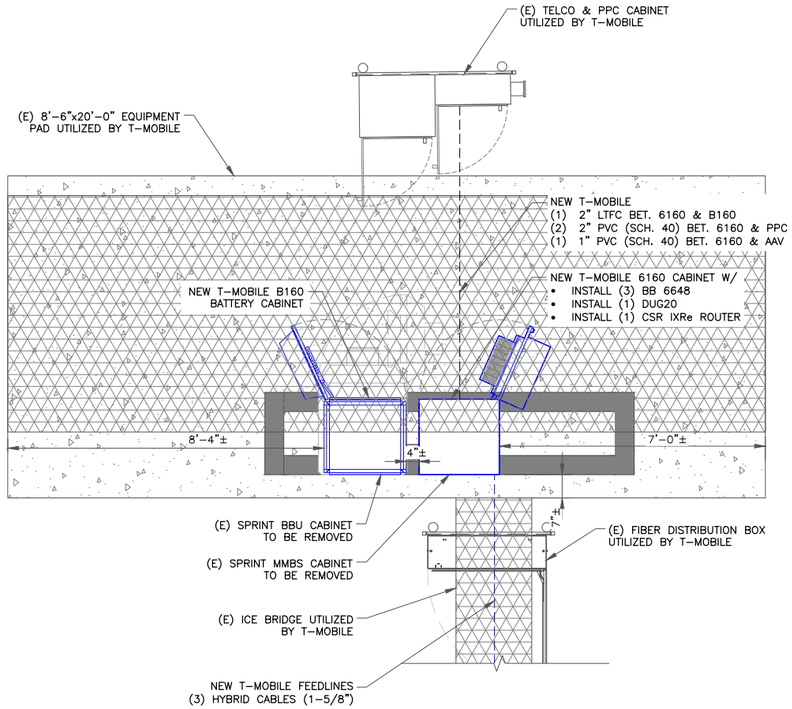
1. PLANS BASED ON SITE PLAN PROVIDED BY TOWER OWNER AND SITE VISIT PERFORMED BY INFINIGY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING T-MOBILE EQUIPMENT.



1 SITE PLAN
SCALE: 2' 1' 0 2' 3/8"=1'-0" (FULL SIZE) 3/16"=1'-0" (11x17)

NOTES:

1. THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.
2. CONTRACTOR SHALL REMOVE EXISTING GRATING PRIOR TO CABINET INSTALLATION IF NECESSARY



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

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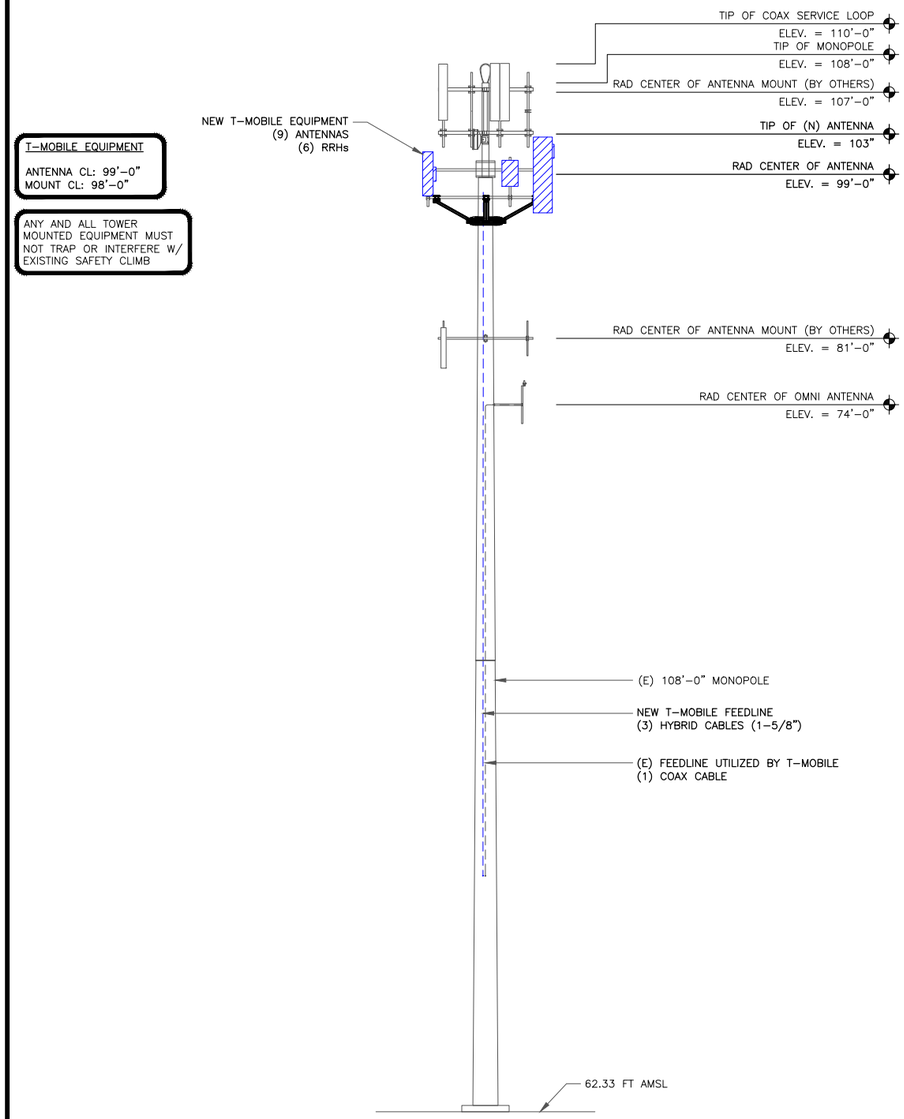
11/11/2021

SHEET NUMBER: C-1

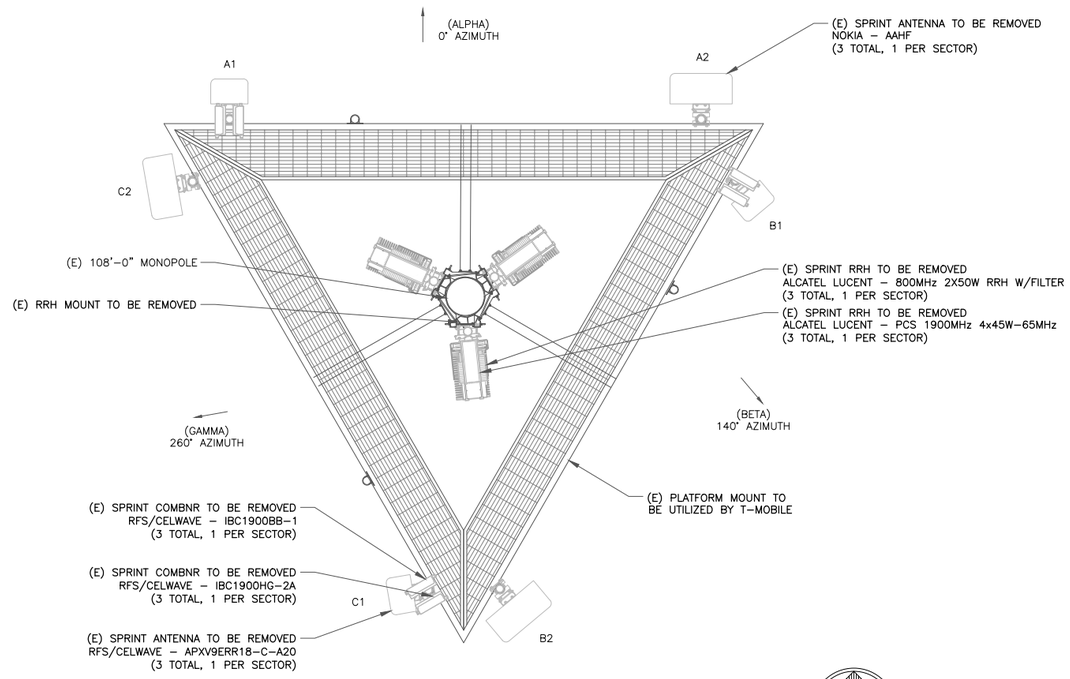
REVISION: 0

NOTES:

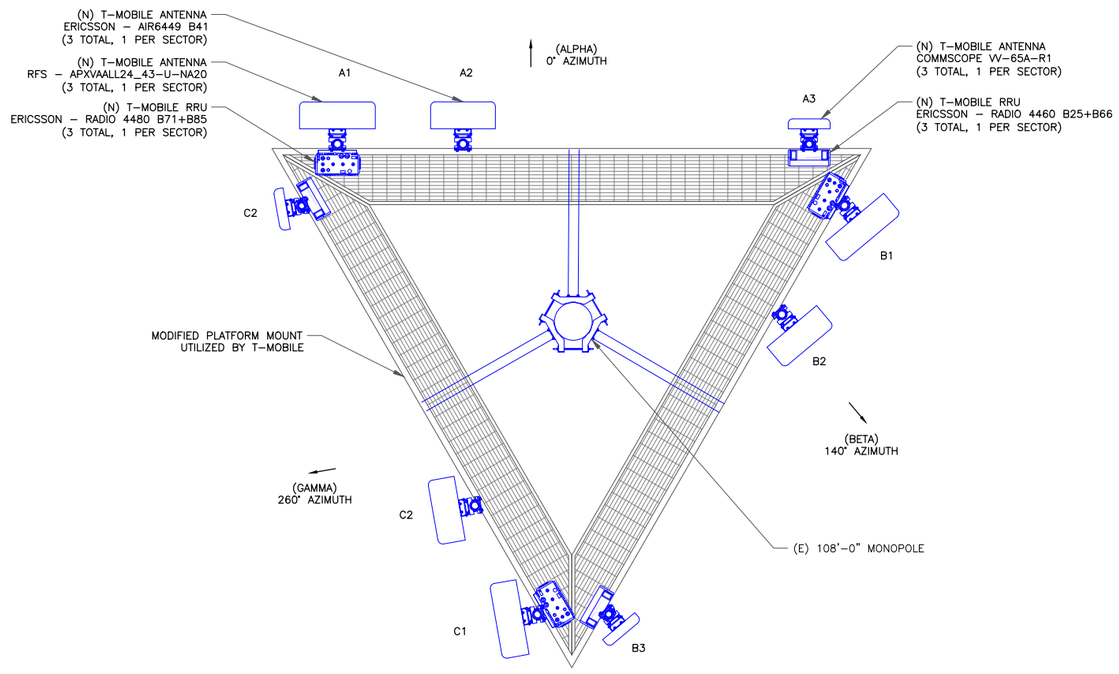
1. ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
2. INFINIGY HAS NOT EVALUATED THE TOWER STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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LICENSED PROFESSIONAL ENGINEER

11/11/2021

SHEET NUMBER: C-2

REVISION: 0

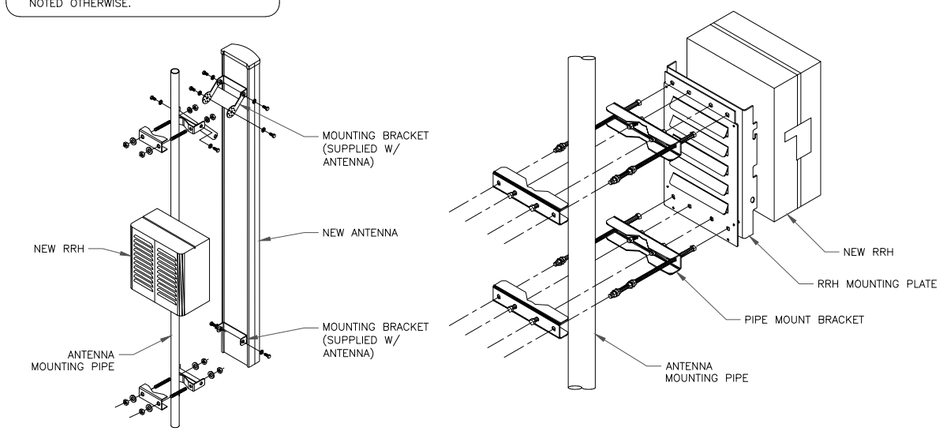
ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	LTE 600/700/N600	99'-0"	0°	RFS	APXVAALL24_43-U-NA20	-	-	(1) ERICSSON - RRUS 4480 B71+B85	(3) 1-5/8" HYBRID (SHARED)
ALPHA	A2	LTE 2500, N2500	99'-0"	0°	ERICSSON	AIR6449 B41	-	-	-	
ALPHA	A3	LTE L2100/1900,G1900	99'-0"	0°	COMMSCOPE	VV-65A-R1	-	-	(1) ERICSSON - RRUS 4460 B25+B66	
BETA	B1	LTE 600/700/N600	99'-0"	140°	RFS	APXVAALL24_43-U-NA20	-	-	(1) ERICSSON - RRUS 4480 B71+B85	(3) 1-5/8" HYBRID (SHARED)
BETA	B2	LTE 2500, N2500	99'-0"	140°	ERICSSON	AIR6449 B41	-	-	-	
BETA	B3	LTE L2100/1900,G1900	99'-0"	140°	COMMSCOPE	VV-65A-R1	-	-	(1) ERICSSON - RRUS 4460 B25+B66	
GAMMA	C1	LTE 600/700/N600	99'-0"	260°	RFS	APXVAALL24_43-U-NA20	-	-	(1) ERICSSON - RRUS 4480 B71+B85	(3) 1-5/8" HYBRID (SHARED)
GAMMA	C2	LTE 2500, N2500	99'-0"	260°	ERICSSON	AIR6449 B41	-	-	-	
GAMMA	C3	LTE L2100/1900,G1900	99'-0"	260°	COMMSCOPE	VV-65A-R1	-	-	(1) ERICSSON - RRUS 4460 B25+B66	

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.



NOTE:

1. CONTRACTOR SHALL INSTALL 3RD DUAL RRH MOUNT TO ACCOMMODATE ALL RRH BRACKETS HOLES IF NECESSARY.

2 ANTENNA WITH RRH MOUNTING DETAIL
SCALE: NOT TO SCALE

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11/11/2021

SHEET NUMBER: C-3

REVISION: 0

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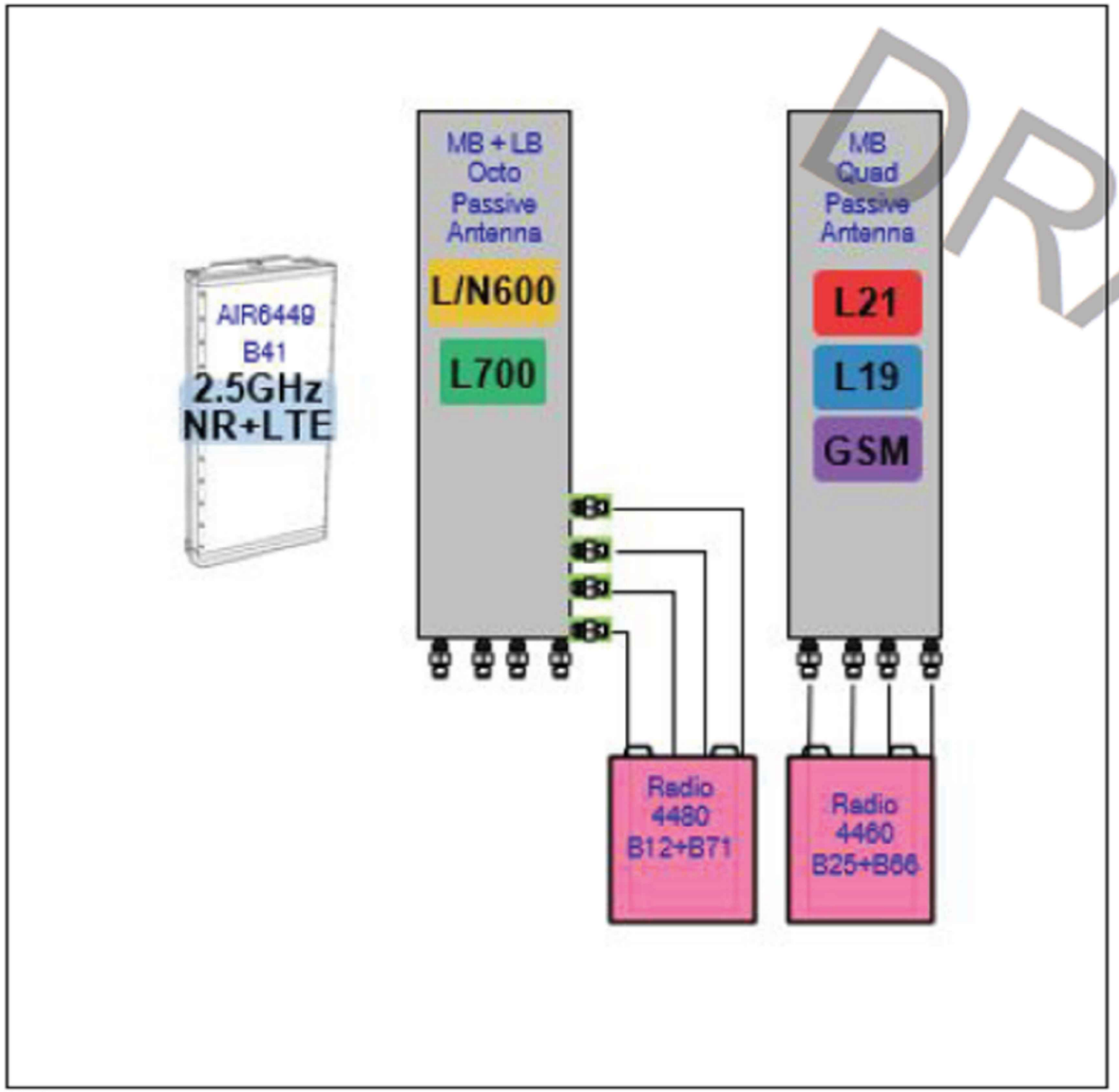

Notes:

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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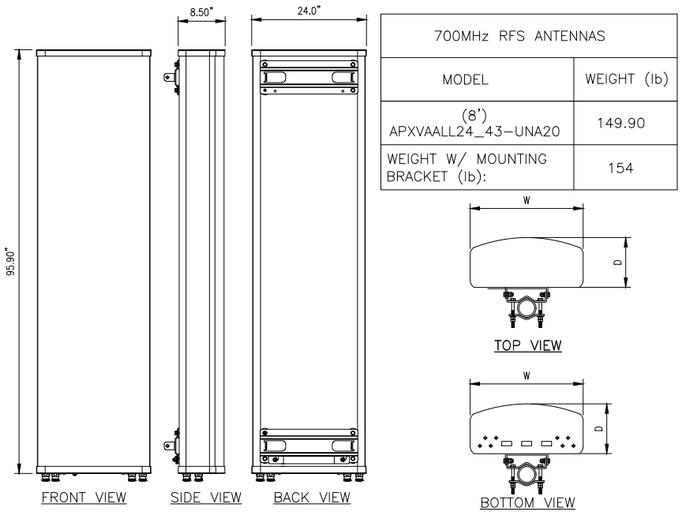
SHEET NUMBER: C-4

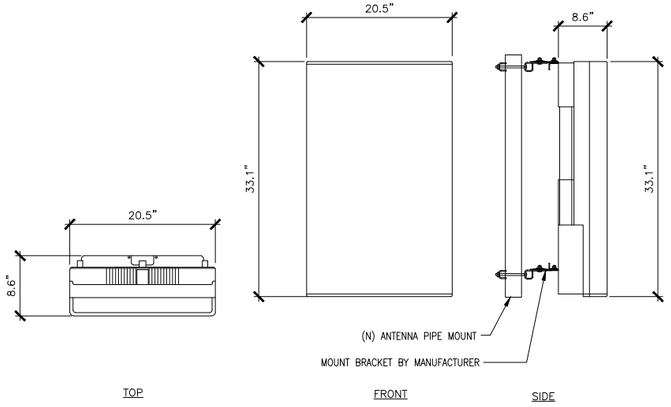
REVISION: 0



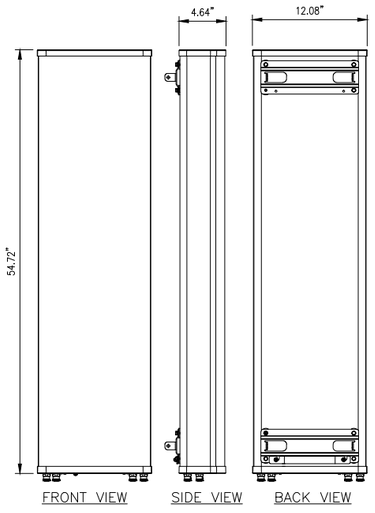
700MHz RFS ANTENNAS	
MODEL	WEIGHT (lb)
(8') APXVAALL24_43-UNA20	149.90
WEIGHT W/ MOUNTING BRACKET (lb):	154

1 (N) APXVAALL24_43-UNA20 ANTENNA SPEC
SCALE: NOT TO SCALE

MANUFACTURER: ERICSSON
MODEL: AIR6449 B41
WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)
DIMENSIONS: 33.1"H. X 20.5"W. X 8.6"D.
FREQUENCY: REFER TO RF DATA SHEET



2 (N) AIR6449 B41 ANTENNA SPEC
SCALE: NOT TO SCALE

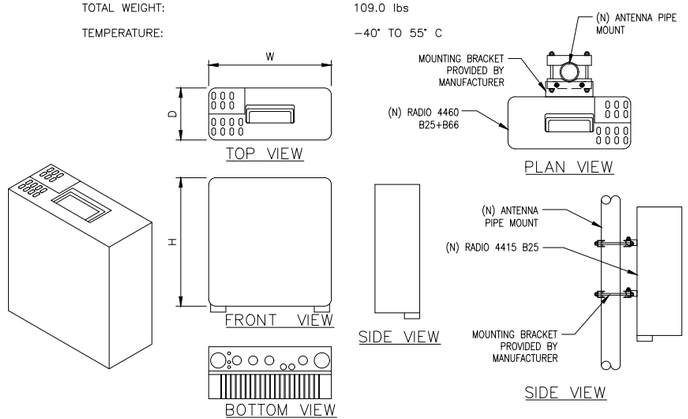


1695-2690MHz COMMSCOPE ANTENNAS	
MODEL	WEIGHT (lb)
(5') VV-65A-R1	23.8
WEIGHT W/ MOUNTING BRACKET (lb):	50

3 (N) COMMSCOPE VV-65A-R1 ANTENNA SPEC
SCALE: NOT TO SCALE

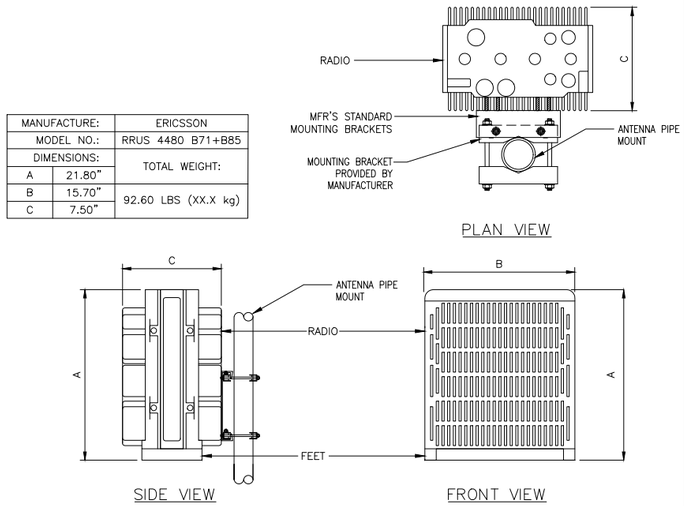
ERICSSON RADIO-4460 B25+B66

DIMENSIONS, WxDxH:	17.00"x15.10"x11.90"
POWER CONSUMPTION:	660 WATTS
TOTAL WEIGHT:	109.0 lbs
TEMPERATURE:	-40° TO 55° C

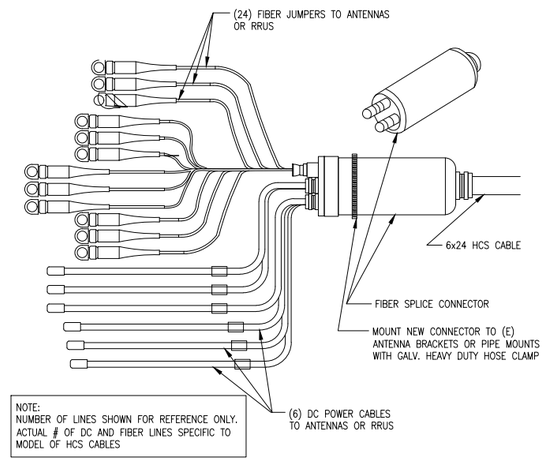


4 (N) RADIO 4460 B25+B66 SPEC
SCALE: NOT TO SCALE

MANUFACTURE:	ERICSSON	
MODEL NO.:	RRUS 4480 B71+B85	
DIMENSIONS:		TOTAL WEIGHT:
A	21.80"	92.60 LBS (XX.X kg)
B	15.70"	
C	7.50"	



5 (N) RADIO 4480 B71+B85 SPEC
SCALE: NOT TO SCALE



NOTE:
NUMBER OF LINES SHOWN FOR REFERENCE ONLY.
ACTUAL # OF DC AND FIBER LINES SPECIFIC TO MODEL OF HCS CABLES

6 (N) 6X24 HCS CABLE DETAIL
SCALE: NOT TO SCALE

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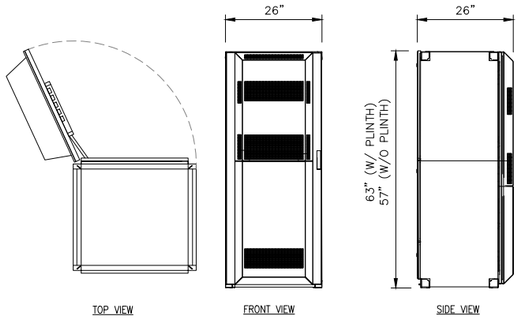
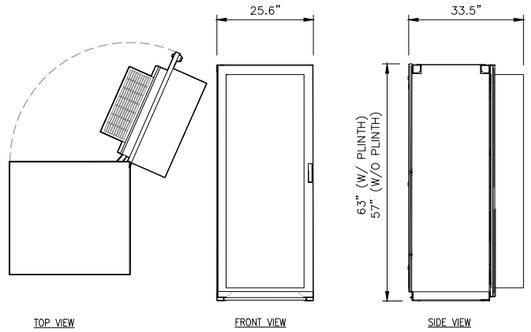


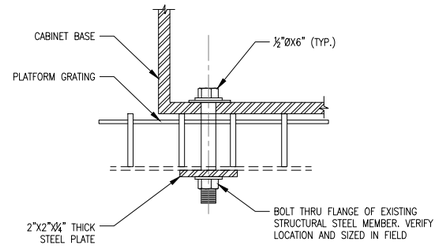
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

1 (N) B160 CABINET DETAIL
SCALE: NOT TO SCALE

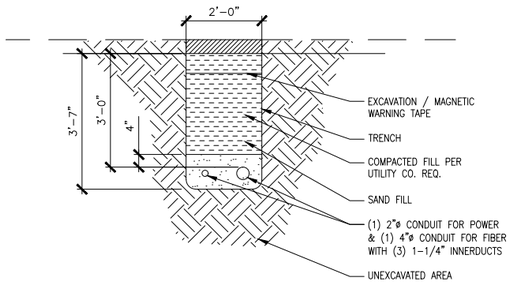


ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

2 (N) 6160 CABINET DETAIL
SCALE: NOT TO SCALE



3 (N) EQUIPMENT CABINET MOUNTING DETAIL
SCALE: NOT TO SCALE



4 (N) CONDUIT TRENCH DETAIL
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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11/11/2021

SHEET NUMBER: C-6
REVISION: 0

NOTES:

1. EXISTING DISTRIBUTION PANEL WAS NOT ACCESSIBLE DURING SITE VISIT PERFORMED BY INFINIGY ON 10/07/21. CONTRACTOR SHALL INFORM ENGINEER IF THERE ARE ANY DISCREPANCIES IN PANEL SCHEDULE.

T-MOBILE PANEL SCHEDULE

MAIN: 200A MAIN BREAKER			**VOTAGE/PHASE:** 120/240V, 1-PHASE, 3-WIRE						**SHORT CIRCUIT CURRENT RATING:** --		
MOUNTING: INSIDE PPC ENCLOSURE			**ENCLOSURE:** NEMA 3R						**SURGE PROTECTION DEVICE:** YES		
					PHASE LOADS (VA)						
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	A	B	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
6160	**7000**	**C**	**100**	1	7001		2	60	C	1	SURGE PROTECTION
	7000	**C**		3		7001	4		C	1	
6160 GFI	**180**	**C**	**20**	5	380		6	20	NC	200	TOWER LIGHTS
BLANK				7		200	8		NC	200	
				9	0		10				BLANK
				11		0	12				
				13	0		14				
				15		0	16				
				17	0		18				
				19		0	20				
				21	0		22				
				23		0	24				
BASE LOAD (VA) =					7381	7201					
25% OF CONTINUOUS LOAD (VA) =					1750	1750					
TOTAL LOAD (VA) =					9131	8951					
TOTAL LOAD (A) =					76	75					

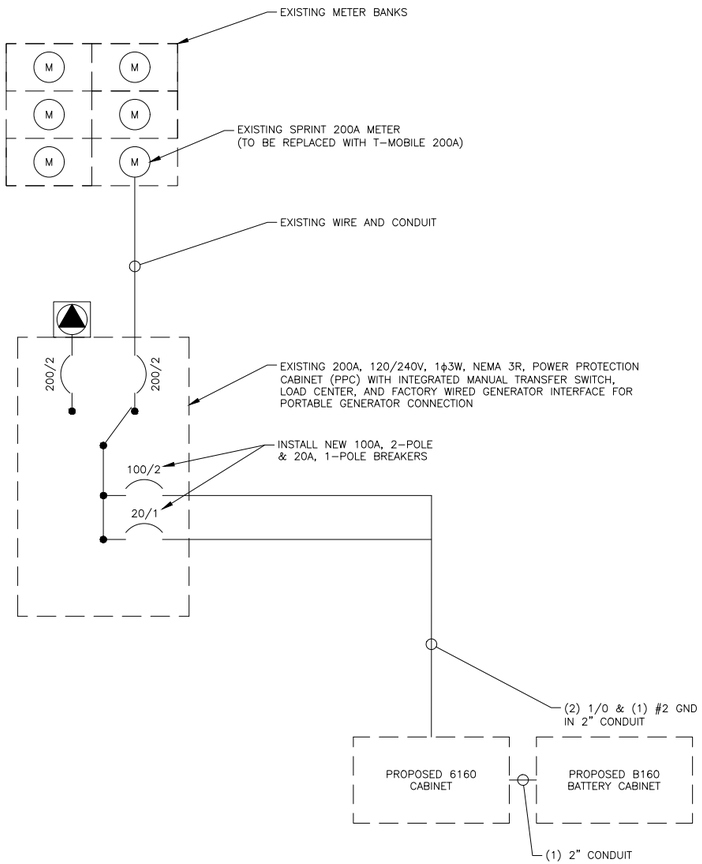
C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD

NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING.
CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED VALUES.

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.
4. EXISTING METER WAS NOT ACCESSIBLE DURING SITE VISIT PERFORMED BY INFINIGY ON 10/07/21. CONTRACTOR SHALL INFORM ENGINEER IF THERE ARE ANY DISCREPANCIES IN PANEL SCHEDULE.



2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CTHA812A

BU #: **876363**
HARTFORD - NU (SSUSA)

219 NEW PARK RD.
HARTFORD, CT 06106-2949

EXISTING 108'-0" MONOPOLE

ISSUED FOR:

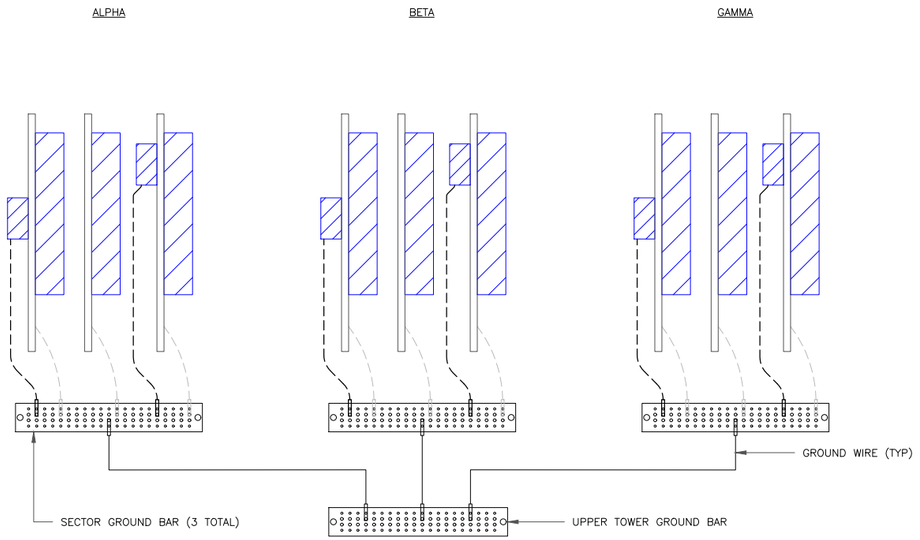
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	11/11/2021	RCD	FINALS	SS

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER

11/11/2021

SHEET NUMBER: E-1

REVISION: 0



NOTE:

ALL NEW GROUNDS TO BE #6 STRANDED COPPER WITH GREEN INSULATION UNLESS NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

T-Mobile
35 GRIFFIN ROAD
BLOOMFIELD, CT 06002

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

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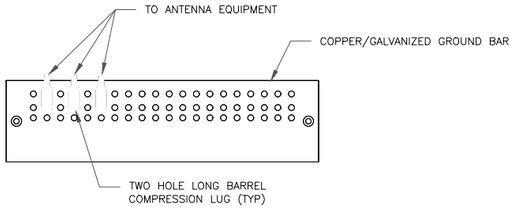
SHEET NUMBER: G-1

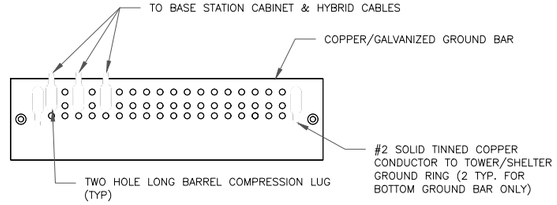
REVISION: 0



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 ANTENNA MOUNT STEEL.

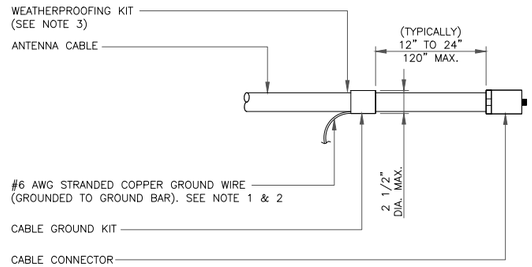
1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



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.

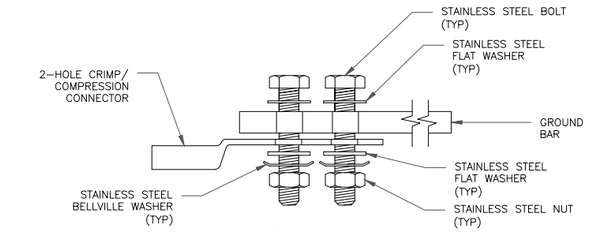
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



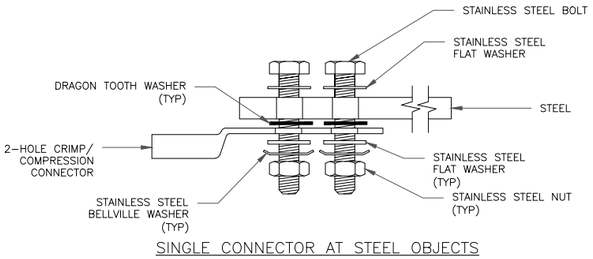
NOTES:

1. 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.

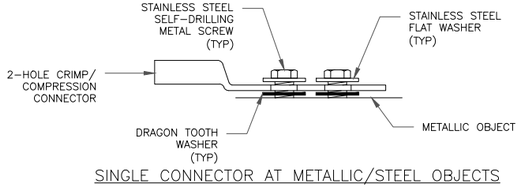
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE

5 NOT USED
SCALE: NOT TO SCALE

6 NOT USED
SCALE: NOT TO SCALE

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REVISION: 0