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

VIA ELECTRONIC MAIL

November 26, 2018

William Stone
Real Estate Specialist
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

RE: **EM-T-MOBILE-166-181114** – T-Mobile notice of intent to modify an existing telecommunications facility located at 347 East Street, Wolcott, Connecticut.

Dear Mr. Stone:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 21, 2018 submitted in response to the Council's November 20, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/FOC/emr

Robidoux, Evan

From: Stone, William <William.Stone@crowncastle.com>
Sent: Wednesday, November 21, 2018 1:21 PM
To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-T-MOBILE-166-181114-EastSt-Wolcott
Attachments: EM-T-Mobile-166-181114 Incomplete Notice Response Letter 11 21 18.pdf

Good afternoon Evan,

Attached is the response letter that is being sent out today along with the copies of the documents.

Have a great Thanksgiving!

WILL STONE
Real Estate Specialist
T: (518) 373-3543 | M: (518) 210-0495 I F: (724) 416-6581

CROWN CASTLE
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
Crowncastle.com

From: Stone, William
Sent: Tuesday, November 20, 2018 4:09 PM
To: 'Robidoux, Evan'
Cc: 'CSC-DL Siting Council'
Subject: RE: Council Incomplete Letter for EM-T-MOBILE-166-181114-EastSt-Wolcott

Evan – not sure how the signature didn't make it on the document that was submitted, but attached is the file with the signature. I'll be sending in a response letter along with 3 copies of the attached structural analysis.

WILL STONE
Real Estate Specialist
T: (518) 373-3543 | M: (518) 210-0495 I F: (724) 416-6581

CROWN CASTLE
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
Crowncastle.com

From: Stone, William
Sent: Tuesday, November 20, 2018 4:03 PM
To: 'Robidoux, Evan' <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter for EM-T-MOBILE-166-181114-EastSt-Wolcott

Good afternoon Evan,

I'm a little confused on this one. Attached are the Title page and First Page of the Modification Report and Modification Design. I see a CT stamp for both, is this issue that they were stamped, however, not signed?

Thank you!

WILL STONE
Real Estate Specialist
T: (518) 373-3543 | M: (518) 210-0495 I F: (724) 416-6581

CROWN CASTLE
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
Crowncastle.com

From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Tuesday, November 20, 2018 3:02 PM
To: Stone, William <William.Stone@crowncastle.com>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-T-MOBILE-166-181114-EastSt-Wolcott

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

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

November 21, 2018 VIA FEDEX

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

RE: EM-T-Mobile-166-181114-EastSt-Wolcott– Incomplete Notice Response

Dear Ms. Bachman:

Per the letter received dated 11/20/18 – attached are (3) copies of the passing Structural Modification Report and Modification Design Drawings with the engineer's signature along with a copy of the letter for reference. Please let me know if you have any questions.

Regards,

William E Stone

Will Stone
518-373-3543
william.stone@crowncastle.com
Area Real Estate Specialist

Date: **October 10, 2018**

Charles Trask
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject:	**Structural Modification Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Carrier Site Number:**	 CT11494B
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Order Number:**	806362 NHV 108 943133 512700 1628360 446207 Rev. 1
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1628360
Site Data:	**INTERSECTION OF RTE 322/MERIDIAN RDWOLCOTT SITE, WOLCOTT, New Haven County, CT** **Latitude *41° 33' 34.41"*, Longitude *-72° 56' 49.1"*** **185 Foot - Self Support Tower**	

Dear Charles Trask,

Jacobs Engineering Group, Inc. is pleased to submit this **"Structural Modification 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:

LC4: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

Structural analysis prepared by: Philip Lin

Respectfully submitted by:

Engineer of Record:
Paul L. Mucci, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 185 ft Self Support tower designed by ROHN. A proposed 5 ft tower extension has been considered in this analysis, bringing the total tower height to 185ft.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	97 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	0.75 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)
186.0	186.0	3	commscope	SBNHH-1D65A w/ Mount Pipe	2 16	1-3/8 1-5/8
		3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		6	rfs celwave	ATMAA1412D-1A20		
		3	sitepro1	VFA12-HD		

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)
177.0	177.0	3	alcatel lucent	RRH2X60-AWS	13	1-5/8
		3	alcatel lucent	RRH2X60-PCS		
		3	alcatel lucent	RRH2x60-700		
		2	andrew	DB846F65ZAXY w/ Mount Pipe		
		2	antel	LPA-80063/6CFx5 w/ Mount Pipe		
		6	commscope	SBNHH-1D45B w/ Mount Pipe		
		3	commscope	SBNHH-1D65B w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		2	swedcom	SC-E 6014 rev2 w/ Mount Pipe		
		1	tower mounts (crown)	Sector Mount [SM 504-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
168.0	168.0	1	dragonwave	A-ANT-18G-2-C	4 1	1-1/4 7983A
		1	andrew	VHLP2-18		
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz		
		6	alcatel lucent	RRH2x50-800		
		3	commscope	NNVV-65B-R4		
		3	nokia	AAHC		
		1	tower mounts (crown)	Sector Mount [SM 402-3]		
158.0	160.0	1	andrew	SBNH-1D6565C w/ Mount Pipe	12 2 4	1-1/4 3/8 3/4
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		6	kaelus	DBC0061F1V51-2		
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		2	quintel technology	QS66512-2 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
	158.0	3	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11		
		3	powerwave technologies	7020.00		
		1	raycap	DC6-48-60-18-8F		
		1	tower mounts (crown)	Sector Mount [SM 504-3]		
40.0	40.0	1	gps	GPS_A	1	1/2
		1	tower mounts (crown)	Side Arm Mount [SO 306-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2303630	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	217670	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	529684	CCISITES
4-EXPOSURE CATEGORY/TOPOGRAPHIC FACTOR	Crown Castle	7872381	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), 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.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Tower modifications outlined in Appendix D must be installed for this analysis to be valid.
4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically and must be replaced if damaged or cracked. Refer to Crown Castle document ENG-PRC-10012, Base Plate Grout Repair.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group, Inc. 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
T1	185 - 180	Leg	ROHN 2.5 STD	2	-5.445	57.192	9.5	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	15	-29.214	45.528	64.2	Pass
T3	160 - 140	Leg	ROHN 3 X-STR	54	-79.112	94.336	83.9	Pass
T4	140 - 120	Leg	ROHN 4 X-STR	93	-122.375	159.904	76.5	Pass
T5	120 - 100	Leg	ROHN 5 X-STR	132	-154.293	201.195	76.7	Pass
T6	100 - 80	Leg	ROHN 5 X-STR	159	-187.502	201.111	93.2	Pass
T7	80 - 60	Leg	ROHN 6 EHS	186	-217.308	243.965	89.1	Pass
T8	60 - 40	Leg	ROHN 6 X-STR	213	-246.654	303.623	81.2	Pass
T9	40 - 20	Leg	ROHN 6 X-STR	240	-274.421	303.585	90.4	Pass
T10	20 - 0	Leg	ROHN 8 EHS	267	-286.162	386.706	74.0	Pass
T1	185 - 180	Diagonal	L2x2x1/4	10	-1.961	10.330	19.0 20.2 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T2	180 - 160	Diagonal	ROHN 2 STD	21	-10.567	17.637	59.9	Pass
T3	160 - 140	Diagonal	ROHN 2 STD	72	-11.327	15.994	70.8	Pass
T4	140 - 120	Diagonal	ROHN 2 STD	99	-10.156	13.067	77.7	Pass
T5	120 - 100	Diagonal	ROHN 2.5 STD	138	-12.016	16.376	73.4	Pass
T6	100 - 80	Diagonal	ROHN 2.5 STD	165	-10.587	14.297	74.0	Pass
T7	80 - 60	Diagonal	ROHN 2.5 STD	192	-11.071	12.652	87.5	Pass
T8	60 - 40	Diagonal	ROHN 2.5 X-STR	219	-11.361	13.964	81.4	Pass
T9	40 - 20	Diagonal	ROHN 3 STD	246	-11.132	19.132	58.2	Pass
T10	20 - 0	Diagonal	ROHN 3 STD	279	-17.821	32.170	55.4	Pass
T2	180 - 160	Horizontal	ROHN 1.5 STD	19	-5.640	22.564	25.0	Pass
T3	160 - 140	Horizontal	ROHN 1.5 STD	58	-6.597	19.143	34.5	Pass
T4	140 - 120	Horizontal	ROHN 2 STD	97	-6.927	27.195	25.5 28.1 (b)	Pass
T5	120 - 100	Horizontal	ROHN 2 STD	136	-7.131	22.627	31.5	Pass
T6	100 - 80	Horizontal	ROHN 2 STD	163	-6.966	16.764	41.6	Pass
T7	80 - 60	Horizontal	ROHN 2.5 STD	190	-7.732	28.852	26.8 31.2 (b)	Pass
T8	60 - 40	Horizontal	ROHN 2.5 STD	217	-8.260	22.315	37.0	Pass
T9	40 - 20	Horizontal	ROHN 2.5 STD	244	-8.305	17.669	47.0	Pass
T10	20 - 0	Horizontal	ROHN 3 STD	275	-9.450	31.224	30.3	Pass
T1	185 - 180	Top Girt	L2x2x1/4	4	-0.380	3.506	10.8	Pass
T10	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 x 11GA	280	-4.968	5.558	89.4	Pass
T10	20 - 0	Redund Diag 1 Bracing	2L2x2x1/4x1/4	281	-4.525	9.164	49.4	Pass
T10	20 - 0	Redund Hip 1 Bracing	ROHN 1.5 x 11GA	282	-0.031	4.941	0.6	Pass
T10	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	294	-0.085	10.600	0.8	Pass
T2	180 - 160	Inner Bracing	L2x2x1/8	27	-0.006	6.529	0.5	Pass
T3	160 - 140	Inner Bracing	L2x2x1/8	66	-0.006	4.871	0.6	Pass
T4	140 - 120	Inner Bracing	L2x2x1/8	105	-0.007	3.328	0.7	Pass
T5	120 - 100	Inner Bracing	L2x2x1/8	144	-0.009	2.510	0.8	Pass
T6	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	171	-0.011	5.252	0.6	Pass
T7	80 - 60	Inner Bracing	L3x3x3/16	198	-0.013	6.881	0.5	Pass
T8	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	225	-0.015	11.267	0.4	Pass
T9	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	252	-0.017	8.973	0.5	Pass
T10	20 - 0	Inner Bracing	ROHN 3 STD	297	-0.018	29.869	0.2	Pass
							Summary	
						Leg (T6)	93.2	Pass
						Diagonal (T7)	87.5	Pass
						Horizontal (T9)	47.0	Pass
						Top Girt (T1)	10.8	Pass
						Redund Horz 1 Bracing	89.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						(T10)		
						Redund Diag 1 Bracing (T10)	49.4	Pass
						Redund Hip 1 Bracing (T10)	0.6	Pass
						Redund Hip Diagonal 1 Bracing (T10)	0.8	Pass
						Inner Bracing (T5)	0.8	Pass
						Bolt Checks	69.3	Pass
						Rating =	93.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	83.2	Pass
1	Base Foundation Structure	0	42.6	Pass
1	Base Foundation Soil Interaction	0	34.3	Pass

Structure Rating (max from all components) =	93.2%

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

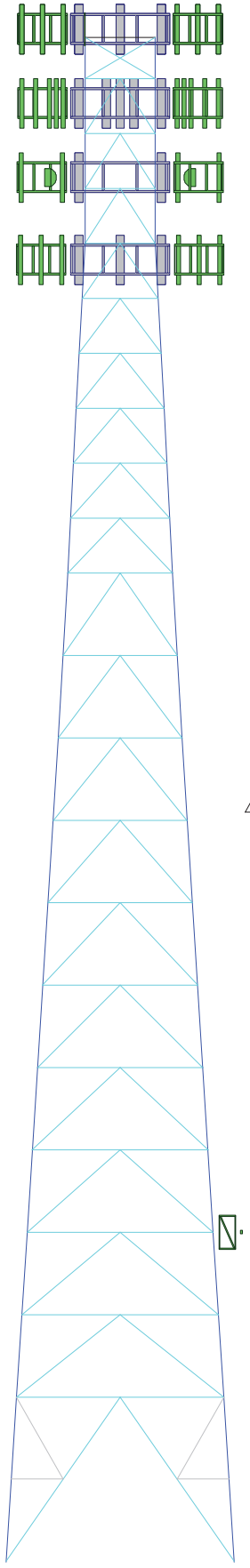
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration, once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	10	9	8	7	6	5	4	3	2	1
Legs	ROHN 8 EHS		ROHN 6 X-STR		ROHN 6 EHS	ROHN 5 X-STR	ROHN 4 X-STR	ROHN 3 X-STR	ROHN 2.5 STD	
Leg Grade					A572-50					
Diagonals		ROHN 3 STD		ROHN 2.5 X-STR		ROHN 2.5 STD		ROHN 2 STD		L2-2x1/4
Diagonal Grade						A572-50				
Top Girts						N.A.				L2-2x1/4
Horizontals	ROHN 3 STD		ROHN 2.5 STD			ROHN 2 STD		ROHN 1.5 STD		N.A.
Red. Horizontals	ROHN 1.5 x 11GA					N.A.				
Red. Diagonals	2L2-2x1.4x1/4					N.A.				
Red. Hips	ROHN 1.5 x 11GA					N.A.				
Inner Bracing	ROHN 3 STD		L3-1/2x3-1/2x1/4		L3x3x3/16	L2-1/2x2-1/2x3/16	L2-2x1/8			N.A.
Face Width (ft) 27.677	25.177		22.5417		20.0417	17.5417	14.9583	12.7083	10.625	8.5417	8.5
# Panels @ (ft)	1 @ 19.9167			10 @ 10					9 @ 6.66667	1 @ 5
Weight (K) 27.8	5.0	4.6	4.4	3.3	2.8	2.6	2.0	1.5	1.2	0.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8"x4'	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	AAHC	168
SBNHH-1D65A w/ Mount Pipe	186	(3) RRH2x50-800	168
(2) ATMAA1412D-1A20	186	(3) RRH2x50-800	168
(2) ATMAA1412D-1A20	186	(3) PCS 1900MHz 4x45W-65MHz	168
(2) ATMAA1412D-1A20	186	Sector Mount [SM 402-3]	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	A-ANT-18G-2-C	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	VHLP2-18	168
APXVAARR24_43-U-NA20 w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	(2) DBC0061F1V51-2	158
AIR 32 B2A/B66AA w/ Mount Pipe	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	RRUS 32 B2	158
RADIO 4449 B12/B71	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	7770.00 w/ Mount Pipe	158
VFA12-HD	186	AM-X-CD-16-65-00T-RET w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	AM-X-CD-16-65-00T-RET w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	TPA-65R-LCUUUU-H8 w/ Mount Pipe	158
(2) 6' x 2" Mount Pipe	186	SBNH-1D6565C w/ Mount Pipe	158
(2) DB846F65ZAXY w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) LPA-80063/6CFx5 w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) SC-E 6014 rev2 w/ Mount Pipe	177	DTMABP7819VG12A	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
(2) SBNHH-1D45B w/ Mount Pipe	177	7020.00	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
SBNHH-1D65B w/ Mount Pipe	177	RRUS 32	158
RRH2x60-700	177	RRUS 11	158
RRH2x60-700	177	RRUS 11	158
RRH2x60-700	177	RRUS 11	158
RRH2X60-AWS	177	DC6-48-60-18-8F	158
RRH2X60-AWS	177	DC6-48-60-18-8F	158
RRH2X60-AWS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	(2) 5' x 2' Pipe Mount	158
RRH2X60-PCS	177	Sector Mount [SM 504-3]	158
(2) DB-T1-6Z-8AB-0Z	177	QS66512-2 w/ Mount Pipe	158
Sector Mount [SM 504-3]	177	QS66512-2 w/ Mount Pipe	158
NNVV-65B-R4	168	GPS_A	40
NNVV-65B-R4	168	Side Arm Mount [SO 306-1]	40
NNVV-65B-R4	168		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 93.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 313 K
SHEAR: 37 K

UPLIFT: -277 K
SHEAR: 34 K

AXIAL 164 K
SHEAR 18 K *MOMENT 2222 kip-ft*
TORQUE 11 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 68 K
SHEAR 61 K *MOMENT 7053 kip-ft*
TORQUE 53 kip-ft
REACTIONS - 97 mph WIND

Jacobs Engineering Group, Inc.
JACOBS
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job:	***NHV 108 943133***		
Project:	***BU806362_WO1628360***		
Client:	Crown Castle	Drawn by: P Lin	App'd:
Code:	TIA-222-G	Date: 10/08/18	Scale: NTS
Path:			Dwg No. E-1

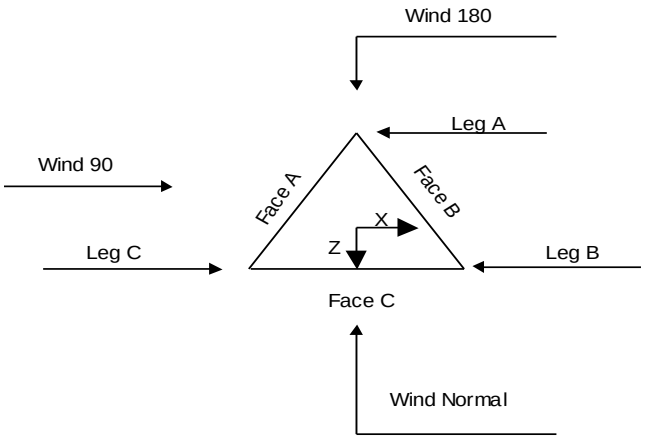
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 185.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 8.500 ft at the top and 27.677 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 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.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	185.000-180.000			8.500	1	5.000
T2	180.000-160.000			8.500	1	20.000
T3	160.000-140.000			8.542	1	20.000
T4	140.000-120.000			10.625	1	20.000
T5	120.000-100.000			12.708	1	20.000
T6	100.000-80.000			14.958	1	20.000
T7	80.000-60.000			17.542	1	20.000
T8	60.000-40.000			20.042	1	20.000
T9	40.000-20.000			22.542	1	20.000
T10	20.000-0.000			25.177	1	20.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	185.000-180.000	5.000	X Brace	No	Yes	0.000	0.000
T2	180.000-160.000	6.667	K Brace Down	No	Yes	0.000	0.000
T3	160.000-140.000	6.667	K Brace Down	No	Yes	0.000	0.000
T4	140.000-120.000	6.667	K Brace Down	No	Yes	0.000	0.000
T5	120.000-100.000	10.000	K Brace Down	No	Yes	0.000	0.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	100.000-80.000	10.000	K Brace Down	No	Yes	0.000	0.000
T7	80.000-60.000	10.000	K Brace Down	No	Yes	0.000	0.000
T8	60.000-40.000	10.000	K Brace Down	No	Yes	0.000	0.000
T9	40.000-20.000	10.000	K Brace Down	No	Yes	0.000	0.000
T10	20.000-0.000	19.917	K1 Down	No	Yes	0.000	1.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 185.000-180.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A572-50 (50 ksi)
T2 180.000-160.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 160.000-140.000	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 140.000-120.000	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 120.000-100.000	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 100.000-80.000	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 80.000-60.000	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 60.000-40.000	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)
T9 40.000-20.000	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T10 20.000-0.000	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 185.000-180.000	Equal Angle	L2x2x1/4	A572-50 (50 ksi)	Pipe		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2	None	Pipe		A618-50	Pipe	ROHN 1.5 STD	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
180.000-160.000				(50 ksi)			(50 ksi)
T3 160.000-140.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T4 140.000-120.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 120.000-100.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 100.000-80.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T7 80.000-60.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 60.000-40.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 40.000-20.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T10 20.000-0.000	None	Pipe		A618-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 180.000-160.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 160.000-140.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 140.000-120.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 120.000-100.000	Pipe		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 100.000-80.000	Pipe		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.000-60.000	Pipe		A572-50 (50 ksi)	Single Angle	L3x3x3/16	A572-50 (50 ksi)
T8 60.000-40.000	Pipe		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 40.000-20.000	Pipe		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 20.000-0.000	Pipe		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T10 20.000-0.000	A572-50 (50 ksi)	Horizontal (1)	Pipe	ROHN 1.5 x 11GA	1
		Diagonal (1)	Double Equal Angle	2L2x2x1/4x1/4	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
		Hip (1)	Pipe	ROHN 1.5 x 11GA	1
		Hip Diagonal (1)	Pipe	ROHN 2.5 STD	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 185.000-180.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T2 180.000-160.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T3 160.000-140.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T4 140.000-120.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T5 120.000-100.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T6 100.000-80.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T7 80.000-60.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T8 60.000-40.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T9 40.000-20.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000
T10 20.000-0.000	0.000	0.000	A36 (36 ksi)	1	1.03	1.05	0.000	0.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 185.000-180.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.0	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
00																	
T4	Yes	No	1	1		1		1		1		1		1		1	
140.000-120.000				1		1		1		1		1		1		1	
T5	Yes	No	1	1		1		1		1		1		1		1	
120.000-100.000				1		1		1		1		1		1		1	
T6	Yes	No	1	1		1		1		1		1		1		1	
100.000-80.000				1		1		1		1		1		1		1	
T7	Yes	No	1	1		1		1		1		1		1		1	
80.000-60.000				1		1		1		1		1		1		1	
T8	Yes	No	1	1		1		1		1		1		1		1	
60.000-40.000				1		1		1		1		1		1		1	
T9	Yes	No	1	1		1		1		1		1		1		1	
40.000-20.000				1		1		1		1		1		1		1	
T10	Yes	No	1	1		1		1		1		1		1		1	
20.000-0.000				1		1		1		1		1		1		1	

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	1	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	1	0.000	0.75
185.000-180.000														
T2	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
180.000-160.000														
T3	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
160.000-140.000														
T4	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
140.000-120.000														
T5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
120.000-100.000														
T6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
100.000-80.000														
T7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
80.000-60.000														
T8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
60.000-40.000														
T9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
40.000-20.000														

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T10 20.000-0.000	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 185.000-180.000	Flange	0.625 A325N	4	0.500 A325X	1	0.500 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 180.000-160.000	Flange	0.750 A325N	4	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T3 160.000-140.000	Flange	0.875 A325N	0	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T4 140.000-120.000	Flange	1.000 A325N	4	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T5 120.000-100.000	Flange	1.000 A325N	4	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T6 100.000-80.000	Flange	1.000 A325N	6	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	2	0.000 A325N	0
T7 80.000-60.000	Flange	1.000 A325N	6	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T8 60.000-40.000	Flange	1.000 A325N	6	0.625 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T9 40.000-20.000	Flange	1.000 A325N	8	0.625 A325N	3	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T10 20.000-0.000	Flange	1.000 A449	0	0.750 A325N	3	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.750 A325N	2	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Safety Line 3/8 *** FACE A ***	C	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.5	1	1	0.500	0.375		0.000
LDF4-50A(1/	A	No	No	Ar (CaAa)	40.000 -	0.000	-0.44	1	1	0.500	0.630		0.000

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
2")					0.000								
561(1-5/8")	A	No	No	Ar (CaAa)	177.000 - 0.000	0.000	-0.4	12	2	0.500	1.625		0.001
561(1-5/8")	A	No	No	Ar (CaAa)	177.000 - 0.000	0.000	-0.41	1	1	0.500	1.625		0.001
Feedline Ladder (Af) *	A	No	No	Af (CaAa)	177.000 - 0.000	0.000	-0.4	1	1	3.000	3.000		0.008
HB114-1-0813U4-M5J(1-1/4)	A	No	No	Ar (CaAa)	168.000 - 0.000	2.000	0.45	4	4	0.500	1.540		0.001
7983A(ELLIPTICAL)	A	No	No	Ar (CaAa)	168.000 - 0.000	0.000	0.41	1	1	0.500	0.573		0.000
Feedline Ladder (Af) *** FACE C ***	A	No	No	Af (CaAa)	168.000 - 0.000	0.000	0.44	1	1	3.000	3.000		0.008
HJ7-50A(1-5/8")	C	No	No	Ar (CaAa)	185.000 - 158.000	-0.500	-0.33	18	12	0.500	1.980		0.001
Feedline Ladder (Af) *	C	No	No	Af (CaAa)	185.000 - 158.000	-0.500	-0.32	1	1	3.000	3.000		0.008
HJ7-50A(1-5/8")	C	No	No	Ar (CaAa)	158.000 - 0.000	-0.500	-0.33	30	12	0.500	1.980		0.001
2" Rigid Conduit	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	2	2	0.500	2.000		0.003
FB-L98B-034-XXX(3/8")	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	2	2	0.500	0.000		0.000
WR-VG86ST-BRD(3/4")	C	No	No	Ar (CaAa)	158.000 - 0.000	0.000	-0.3	4	4	0.500	0.000		0.001
Feedline Ladder (Af) ********** ** ***	C	No	No	Af (CaAa)	158.000 - 0.000	-0.500	-0.34	2	1	3.000	3.000		0.008

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
********** ***								

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

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
T1	185.000-180.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	20.320	0.000	0.136
T2	180.000-160.000	A	0.000	0.000	53.799	0.000	0.547
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	82.030	0.000	0.547
T3	160.000-140.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	140.998	0.000	1.068
T4	140.000-120.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T5	120.000-100.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T6	100.000-80.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T7	80.000-60.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T8	60.000-40.000	A	0.000	0.000	75.716	0.000	0.785
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T9	40.000-20.000	A	0.000	0.000	76.976	0.000	0.788
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125
T10	20.000-0.000	A	0.000	0.000	76.976	0.000	0.788
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	147.550	0.000	1.125

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
T1	185.000-180.000	A	1.780	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	25.396	0.000	0.517
T2	180.000-160.000	A	1.767	0.000	0.000	82.625	0.000	1.728
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	109.274	0.000	2.154
T3	160.000-140.000	A	1.745	0.000	0.000	126.216	0.000	2.518
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	174.305	0.000	3.593
T4	140.000-120.000	A	1.720	0.000	0.000	125.491	0.000	2.489
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	180.623	0.000	3.718
T5	120.000-100.000	A	1.692	0.000	0.000	124.657	0.000	2.456
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	179.541	0.000	3.676
T6	100.000-80.000	A	1.658	0.000	0.000	123.675	0.000	2.418
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	178.265	0.000	3.627
T7	80.000-60.000	A	1.617	0.000	0.000	122.473	0.000	2.372
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	176.703	0.000	3.568
T8	60.000-40.000	A	1.564	0.000	0.000	120.911	0.000	2.313

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	0.000	0.000	0.000
		C		0.000	0.000	174.674	0.000	3.491
T9	40.000-20.000	A	1.486	0.000	0.000	125.843	0.000	2.308
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	170.164	0.000	3.381
T10	20.000-0.000	A	1.331	0.000	0.000	120.724	0.000	2.132
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	164.115	0.000	3.170

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	185.000-180.000	14.097	4.622	11.568	4.849
T2	180.000-160.000	5.835	4.444	0.864	4.302
T3	160.000-140.000	5.563	4.074	2.787	3.676
T4	140.000-120.000	6.670	5.075	3.743	4.723
T5	120.000-100.000	7.881	5.885	4.545	5.540
T6	100.000-80.000	9.135	6.703	5.345	6.294
T7	80.000-60.000	10.135	7.277	6.024	6.840
T8	60.000-40.000	11.223	7.951	6.814	7.475
T9	40.000-20.000	11.203	8.578	5.369	8.962
T10	20.000-0.000	12.170	9.339	6.301	9.398

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	17	HJ7-50A(1-5/8")	180.00 - 185.00	0.6000	0.5911
T1	20	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.5911
T2	1	Safety Line 3/8	160.00 - 180.00	0.6000	0.6000
T2	4	561(1-5/8")	160.00 - 177.00	0.6000	0.6000
T2	5	561(1-5/8")	160.00 - 177.00	0.6000	0.6000
T2	6	Feedline Ladder (Af)	160.00 - 177.00	0.6000	0.6000
T2	9	HB114-1-0813U4-M5J(1-1/4)	160.00 - 168.00	0.6000	0.6000
T2	12	7983A(ELLIPTICAL)	160.00 - 168.00	0.6000	0.6000
T2	13	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T2	17	HJ7-50A(1-5/8")	160.00 - 180.00	0.6000	0.6000
T2	20	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	1	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	4	561(1-5/8")	140.00 - 160.00	0.6000	0.6000
T3	5	561(1-5/8")	140.00 - 160.00	0.6000	0.6000
T3	6	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	9	HB114-1-0813U4-M5J(1-1/4)	140.00 - 160.00	0.6000	0.6000
T3	12	7983A(ELLIPTICAL)	140.00 - 160.00	0.6000	0.6000
T3	13	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	17	HJ7-50A(1-5/8")	158.00 - 160.00	0.6000	0.6000
T3	20	Feedline Ladder (Af)	158.00 - 160.00	0.6000	0.6000
T3	22	HJ7-50A(1-5/8")	140.00 - 158.00	0.6000	0.6000
T3	23	2" Rigid Conduit	140.00 - 158.00	0.6000	0.6000
T3	24	FB-L98B-034-XXX(3/8")	140.00 - 158.00	0.6000	0.6000
T3	25	WR-VG86ST-BRD(3/4")	140.00 - 158.00	0.6000	0.6000
T3	27	Feedline Ladder (Af)	140.00 - 158.00	0.6000	0.6000
T4	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	4	561(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	5	561(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	6	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	9	HB114-1-0813U4-M5J(1-1/4)	120.00 - 140.00	0.6000	0.6000
T4	12	7983A(ELLIPTICAL)	120.00 - 140.00	0.6000	0.6000
T4	13	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	22	HJ7-50A(1-5/8")	120.00 - 140.00	0.6000	0.6000
T4	23	2" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	24	FB-L98B-034-XXX(3/8")	120.00 - 140.00	0.6000	0.6000
T4	25	WR-VG86ST-BRD(3/4")	120.00 - 140.00	0.6000	0.6000
T4	27	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T5	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	4	561(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	5	561(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	6	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	9	HB114-1-0813U4-M5J(1-1/4)	100.00 - 120.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	12	7983A(ELLIPTICAL)	100.00 - 120.00	0.6000	0.6000
T5	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	22	HJ7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	23	2" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	24	FB-L98B-034-XXX(3/8")	100.00 - 120.00	0.6000	0.6000
T5	25	WR-VG86ST-BRD(3/4")	100.00 - 120.00	0.6000	0.6000
T5	27	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	4	561(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	5	561(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	6	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	9	HB114-1-0813U4-M5J(1-1/4)	80.00 - 100.00	0.6000	0.6000
T6	12	7983A(ELLIPTICAL)	80.00 - 100.00	0.6000	0.6000
T6	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	22	HJ7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	23	2" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	24	FB-L98B-034-XXX(3/8")	80.00 - 100.00	0.6000	0.6000
T6	25	WR-VG86ST-BRD(3/4")	80.00 - 100.00	0.6000	0.6000
T6	27	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	4	561(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	5	561(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	6	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	9	HB114-1-0813U4-M5J(1-1/4)	60.00 - 80.00	0.6000	0.6000
T7	12	7983A(ELLIPTICAL)	60.00 - 80.00	0.6000	0.6000
T7	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	22	HJ7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	23	2" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T7	24	FB-L98B-034-XXX(3/8")	60.00 - 80.00	0.6000	0.6000
T7	25	WR-VG86ST-BRD(3/4")	60.00 - 80.00	0.6000	0.6000
T7	27	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	4	561(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	5	561(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	9	HB114-1-0813U4-M5J(1-1/4)	40.00 - 60.00	0.6000	0.6000
T8	12	7983A(ELLIPTICAL)	40.00 - 60.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	22	HJ7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	23	2" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T8	24	FB-L98B-034-XXX(3/8")	40.00 - 60.00	0.6000	0.6000
T8	25	WR-VG86ST-BRD(3/4")	40.00 - 60.00	0.6000	0.6000
T8	27	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	3	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T9	4	561(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	5	561(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	9	HB114-1-0813U4-M5J(1-1/4)	20.00 - 40.00	0.6000	0.6000
T9	12	7983A(ELLIPTICAL)	20.00 - 40.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	22	HJ7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	23	2" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T9	24	FB-L98B-034-XXX(3/8")	20.00 - 40.00	0.6000	0.6000
T9	25	WR-VG86ST-BRD(3/4")	20.00 - 40.00	0.6000	0.6000
T9	27	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	1	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	3	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T10	4	561(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	5	561(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	9	HB114-1-0813U4-M5J(1-1/4)	0.00 - 20.00	0.6000	0.6000
T10	12	7983A(ELLIPTICAL)	0.00 - 20.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	22	HJ7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	23	2" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T10	24	FB-L98B-034-XXX(3/8")	0.00 - 20.00	0.6000	0.6000
T10	25	WR-VG86ST-BRD(3/4")	0.00 - 20.00	0.6000	0.6000
T10	27	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*										
Lightning Rod 5/8"x4'	C	From Leg	0.000		0.000	186.000	No Ice	0.250	0.250	0.031
			0.000				1/2" Ice	0.664	0.664	0.034
			0.000				1" Ice	0.973	0.973	0.039
*** L186 ***										
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000		0.000	186.000	No Ice	6.457	5.527	0.059
			0.000				1/2" Ice	7.072	6.611	0.117
			0.000				1" Ice	7.592	7.397	0.181
(2) ATMAA1412D-1A20	A	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
(2) ATMAA1412D-1A20	B	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
(2) ATMAA1412D-1A20	C	From Leg	4.000		0.000	186.000	No Ice	1.000	0.407	0.013
			0.000				1/2" Ice	1.126	0.497	0.021
			0.000				1" Ice	1.259	0.593	0.030
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.000		0.000	186.000	No Ice	20.480	11.024	0.161
			0.000				1/2" Ice	21.231	12.550	0.297
			0.000				1" Ice	21.990	14.099	0.444

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
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	20.480 21.231 21.990	11.024 12.550 14.099	0.161 0.297 0.444
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	20.480 21.231 21.990	11.024 12.550 14.099	0.161 0.297 0.444
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	6.747 7.202 7.648	6.070 6.867 7.583	0.153 0.214 0.282
RADIO 4449 B12/B71	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
RADIO 4449 B12/B71	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.650 1.810 1.978	1.163 1.301 1.447	0.074 0.090 0.109
VFA12-HD	A	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
VFA12-HD	B	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
VFA12-HD	C	From Leg	2.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	13.200 36.140 46.800	9.200 36.140 46.800	0.658 1.001 1.510
(2) 6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
(2) 6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	186.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
*** L180 *** *** L177 ***									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	7.271 7.832 8.348	7.821 9.010 9.912	0.047 0.114 0.189
(2) LPA-80063/6CFx5 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	9.805 10.373 10.907	10.195 11.363 12.246	0.052 0.144 0.245
(2) SC-E 6014 rev2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	3.564 3.905 4.256	4.223 4.780 5.353	0.032 0.071 0.116
(2) SBNHH-1D45B w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 1/2" Ice 1" Ice	11.637 12.228 12.784	6.946 8.127 9.021	0.088 0.172 0.265
(2) SBNHH-1D45B w/	B	From Leg	4.000	0.000	177.000	No Ice	11.637	6.946	0.088

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
Mount Pipe			0.000				1/2" Ice	12.228	8.127	0.172
			0.000				1" Ice	12.784	9.021	0.265
(2) SBNHH-1D45B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	11.637	6.946	0.088
			0.000				1/2" Ice	12.228	8.127	0.172
			0.000				1" Ice	12.784	9.021	0.265
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	8.289	7.004	0.076
			0.000				1/2" Ice	8.849	8.185	0.145
			0.000				1" Ice	9.374	9.081	0.221
RRH2x60-700	A	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2x60-700	B	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2x60-700	C	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	A	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	B	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-AWS	C	From Leg	4.000	0.000	0.000	177.000	No Ice	3.500	1.816	0.060
			0.000				1/2" Ice	3.761	2.052	0.083
			0.000				1" Ice	4.029	2.289	0.109
RRH2X60-PCS	A	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
RRH2X60-PCS	B	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
RRH2X60-PCS	C	From Leg	4.000	0.000	0.000	177.000	No Ice	2.200	1.723	0.055
			0.000				1/2" Ice	2.393	1.901	0.075
			0.000				1" Ice	2.593	2.087	0.099
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	0.000	177.000	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
Sector Mount [SM 504-3]	C	None			0.000	177.000	No Ice	34.250	34.250	1.708
							1/2" Ice	48.980	48.980	2.286
							1" Ice	63.710	63.710	2.864
*** L168 ***										
NNVV-65B-R4	A	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228
NNVV-65B-R4	B	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228
NNVV-65B-R4	C	From Leg	4.000	0.000	0.000	168.000	No Ice	12.271	5.750	0.077
			0.000				1/2" Ice	12.766	6.207	0.150
			0.000				1" Ice	13.268	6.671	0.228

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
AAHC	A	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
AAHC	B	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
AAHC	C	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	4.212 4.468	2.073 2.265	0.104 0.136
			0.000			1" Ice	4.731	2.468	0.172
(3) RRH2x50-800	A	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.134 2.320	1.789 1.963	0.050 0.071
			0.000			1" Ice	2.512	2.144	0.096
(3) RRH2x50-800	B	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.134 2.320	1.789 1.963	0.050 0.071
			0.000			1" Ice	2.512	2.144	0.096
(3) PCS 1900MHz 4x45W-65MHz	C	From Leg	4.000 0.000	0.000	168.000	No Ice 1/2" Ice	2.322 2.527	2.238 2.441	0.060 0.083
			0.000			1" Ice	2.739	2.651	0.110
Sector Mount [SM 402-3]	C	None		0.000	168.000	No Ice 1/2" Ice	18.910 26.780	18.910 26.780	0.851 1.233
						1" Ice	34.650	34.650	1.616
*** L158 ***									
QS66512-2 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.371 8.931	8.463 9.657	0.137 0.212
			2.000			1" Ice	9.457	10.548	0.296
QS66512-2 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.371 8.931	8.463 9.657	0.137 0.212
			2.000			1" Ice	9.457	10.548	0.296
(2) DBC0061F1V51-2	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
(2) DBC0061F1V51-2	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
(2) DBC0061F1V51-2	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	0.433 0.518	0.413 0.496	0.025 0.031
			2.000			1" Ice	0.609	0.586	0.038
RRUS 32 B2	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
RRUS 32 B2	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	2.731 2.953	1.668 1.855	0.053 0.074
			2.000			1" Ice	3.182	2.049	0.098
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	5.746 6.179	4.254 5.014	0.055 0.103
			2.000			1" Ice	6.607	5.711	0.157
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.000	0.000	158.000	No Ice 1/2" Ice	8.262 8.822	6.304 7.479	0.074 0.139

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	9.346	8.368	0.212
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	158.000	No Ice	8.262	6.304	0.074
			0.000			1/2" Ice	8.822	7.479	0.139
			2.000			1" Ice	9.346	8.368	0.212
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.000	0.000	158.000	No Ice	13.535	10.960	0.114
			0.000			1/2" Ice	14.238	12.486	0.218
			2.000			1" Ice	14.949	14.037	0.331
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.000	0.000	158.000	No Ice	11.683	9.842	0.099
			0.000			1/2" Ice	12.404	11.366	0.189
			2.000			1" Ice	13.135	12.914	0.288
DTMABP7819VG12A	A	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
DTMABP7819VG12A	B	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
DTMABP7819VG12A	C	From Leg	4.000	0.000	158.000	No Ice	0.976	0.339	0.019
			0.000			1/2" Ice	1.100	0.419	0.026
			0.000			1" Ice	1.232	0.510	0.036
7020.00	A	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
7020.00	B	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
7020.00	C	From Leg	4.000	0.000	158.000	No Ice	0.102	0.175	0.002
			0.000			1/2" Ice	0.147	0.239	0.005
			0.000			1" Ice	0.199	0.311	0.009
RRUS 32	A	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 32	B	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 32	C	From Leg	4.000	0.000	158.000	No Ice	2.857	1.777	0.055
			0.000			1/2" Ice	3.083	1.968	0.077
			2.000			1" Ice	3.316	2.166	0.103
RRUS 11	A	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
RRUS 11	B	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
RRUS 11	C	From Leg	4.000	0.000	158.000	No Ice	2.784	1.187	0.051
			0.000			1/2" Ice	2.992	1.334	0.072
			0.000			1" Ice	3.207	1.490	0.095
DC6-48-60-18-8F	A	From Leg	4.000	0.000	158.000	No Ice	0.917	0.917	0.033
			0.000			1/2" Ice	1.458	1.458	0.051
			2.000			1" Ice	1.643	1.643	0.071
DC6-48-60-18-8F	A	From Leg	4.000	0.000	158.000	No Ice	0.917	0.917	0.033
			0.000			1/2" Ice	1.458	1.458	0.051
			0.000			1" Ice	1.643	1.643	0.071
(2) 5' x 2' Pipe Mount	A	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
(2) 5' x 2' Pipe Mount	B	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027

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
			0.000			1" Ice	1.807	1.807	0.040
(2) 5' x 2' Pipe Mount	C	From Leg	4.000	0.000	158.000	No Ice	1.188	1.188	0.018
			0.000			1/2" Ice	1.496	1.496	0.027
			0.000			1" Ice	1.807	1.807	0.040
Sector Mount [SM 504-3]	C	None		0.000	158.000	No Ice	34.250	34.250	1.708
						1/2" Ice	48.980	48.980	2.286
						1" Ice	63.710	63.710	2.864
*** L40 ***									
GPS_A	B	From Leg	4.000	0.000	40.000	No Ice	0.255	0.255	0.001
			0.000			1/2" Ice	0.320	0.320	0.005
			0.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 306-1]	B	From Leg	2.000	0.000	40.000	No Ice	0.980	2.180	0.042
			0.000			1/2" Ice	1.700	3.800	0.062
			0.000			1" Ice	2.420	5.420	0.083
*********									
***									
*									

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
***											
A-ANT-18G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	4.000	67.000		168.000	2.175	No Ice	3.720	0.027
				0.000					1/2" Ice	4.010	0.050
				0.000					1" Ice	4.300	0.070
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	4.000	0.000		168.000	2.175	No Ice	3.720	0.031
				0.000					1/2" Ice	4.010	0.050
				0.000					1" Ice	4.300	0.070
***											
***											
*											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice

Comb. No.	Description
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	4.329	45	0.221	0.043
T2	180 - 160	4.096	45	0.220	0.043
T3	160 - 140	3.167	45	0.204	0.038
T4	140 - 120	2.340	45	0.173	0.029
T5	120 - 100	1.654	45	0.141	0.022
T6	100 - 80	1.109	45	0.114	0.017
T7	80 - 60	0.686	45	0.086	0.012
T8	60 - 40	0.376	45	0.059	0.009
T9	40 - 20	0.164	45	0.038	0.006
T10	20 - 0	0.040	39	0.018	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
186.000	Lightning Rod 5/8"x4'	45	4.329	0.221	0.043	127994
177.000	(2) DB846F65ZAXY w/ Mount Pipe	45	3.956	0.219	0.043	180670
168.000	A-ANT-18G-2-C	45	3.533	0.213	0.041	80329
158.000	QS66512-2 w/ Mount Pipe	45	3.078	0.201	0.037	36913
40.000	GPS_A	45	0.164	0.038	0.006	60881

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	17.781	14	0.902	0.180
T2	180 - 160	16.828	14	0.900	0.179
T3	160 - 140	13.020	14	0.835	0.157
T4	140 - 120	9.627	14	0.708	0.122
T5	120 - 100	6.811	14	0.578	0.093
T6	100 - 80	4.571	14	0.468	0.071
T7	80 - 60	2.830	14	0.351	0.052
T8	60 - 40	1.556	14	0.244	0.036
T9	40 - 20	0.681	14	0.158	0.024
T10	20 - 0	0.162	2	0.072	0.012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
186.000	Lightning Rod 5/8"x4'	14	17.781	0.902	0.180	32498
177.000	(2) DB846F65ZAXY w/ Mount Pipe	14	16.252	0.896	0.178	48184
168.000	A-ANT-18G-2-C	14	14.521	0.871	0.169	20366
158.000	QS66512-2 w/ Mount Pipe	14	12.656	0.824	0.154	9104
40.000	GPS_A	14	0.681	0.158	0.024	14885

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	185	Leg	A325N	0.625	4	0.454	20.709	0.022	1	Bolt Tension
		Diagonal	A325X	0.500	1	1.961	9.719	0.202	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.529	7.952	0.067	1	Bolt Shear
T2	180	Leg	A325N	0.750	4	5.500	29.821	0.184	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.625	3	3.522	12.425	0.283	1	Bolt Shear
		Horizontal	A325N	0.625	2	2.854	12.425	0.230	1	Bolt Shear
T3	160	Diagonal	A325N	0.625	3	3.776	12.425	0.304	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.367	12.425	0.271	1	Bolt Shear
T4	140	Leg	A325N	1.000	4	27.122	53.014	0.512	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.488	12.425	0.281	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.486	12.425	0.281	1	Bolt Shear
T5	120	Leg	A325N	1.000	4	34.528	53.014	0.651	1	Bolt Tension
		Diagonal	A325N	0.625	3	4.078	12.425	0.328	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.566	12.425	0.287	1	Bolt Shear
T6	100	Leg	A325N	1.000	6	28.070	53.014	0.529	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.560	12.425	0.286	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.510	12.425	0.282	1	Bolt Shear
T7	80	Leg	A325N	1.000	6	32.502	53.014	0.613	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.690	12.425	0.297	1	Bolt Shear
		Horizontal	A325N	0.625	2	3.877	12.425	0.312	1	Bolt Shear
T8	60	Leg	A325N	1.000	6	36.763	53.014	0.693	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.787	12.425	0.305	1	Bolt Shear
		Horizontal	A325N	0.625	2	4.197	12.425	0.338	1	Bolt Shear
T9	40	Leg	A325N	1.000	8	30.523	53.014	0.576	1	Bolt Tension
		Diagonal	A325N	0.625	3	3.711	12.425	0.299	1	Bolt Shear
		Horizontal	A325N	0.625	2	4.316	12.425	0.347	1	Bolt Shear
T10	20	Diagonal	A325N	0.750	3	5.940	17.892	0.332	1	Bolt Shear
		Horizontal	A325N	0.750	2	4.728	17.892	0.264	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	ROHN 2.5 STD	5.000	5.000	63.3 K=1.00	1.704	-5.445	57.192	0.095 [1]
T2	180 - 160	ROHN 2.5 STD	20.000	6.667	84.4 K=1.00	1.704	-29.214	45.528	0.642 [1]
T3	160 - 140	ROHN 3 X-STR	20.036	6.679	70.5 K=1.00	3.016	-79.112	94.336	0.839 [1]
T4	140 - 120	ROHN 4 X-STR	20.036	6.679	54.3 K=1.00	4.407	-122.375	159.904	0.765 [1]
T5	120 - 100	ROHN 5 X-STR	20.042	10.021	65.4 K=1.00	6.112	-154.293	201.195	0.767 [1]
T6	100 - 80	ROHN 5 X-STR	20.056	10.028	65.4 K=1.00	6.112	-187.502	201.111	0.932 [1]
T7	80 - 60	ROHN 6 EHS	20.052	10.026	54.1 K=1.00	6.713	-217.308	243.965	0.891 [1]
T8	60 - 40	ROHN 6 X-STR	20.052	10.026	54.8 K=1.00	8.405	-246.654	303.623	0.812 [1]
T9	40 - 20	ROHN 6 X-STR	20.058	10.029	54.8 K=1.00	8.405	-274.421	303.585	0.904 [1]
T10	20 - 0	ROHN 8 EHS	20.052	9.984	41.0 K=1.00	9.719	-286.162	386.706	0.740 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	185 - 180	L2x2x1/4	9.862	4.667	143.2 K=1.00	0.938	-1.961	10.330	0.190 [1]
T2	180 - 160	ROHN 2 STD	7.917	7.695	117.3 K=1.00	1.075	-10.567	17.637	0.599 [1]
T3	160 - 140	ROHN 2 STD	8.315	8.081	123.2 K=1.00	1.075	-11.327	15.994	0.708 [1]
T4	140 - 120	ROHN 2 STD	9.212	8.940	136.3 K=1.00	1.075	-10.156	13.067	0.777 [1]
T5	120 - 100	ROHN 2.5 STD	12.492	12.105	153.3 K=1.00	1.704	-12.016	16.376	0.734 [1]
T6	100 - 80	ROHN 2.5 STD	13.307	12.955	164.1 K=1.00	1.704	-10.587	14.297	0.740 [1]
T7	80 - 60	ROHN 2.5 STD	14.162	13.772	174.4 K=1.00	1.704	-11.071	12.652	0.875 [1]
T8	60 - 40	ROHN 2.5 X-STR	15.072	14.703	190.9 K=1.00	2.254	-11.361	13.964	0.814 [1]
T9	40 - 20	ROHN 3 STD	16.082	15.729	162.2 K=1.00	2.228	-11.132	19.132	0.582 [1]
T10	20 - 0	ROHN 3 STD	24.260	12.130	125.1 K=1.00	2.228	-17.821	32.170	0.554 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	180 - 160	ROHN 1.5 STD	8.528	4.144	79.9 K=1.00	0.799	-5.640	22.564	0.250 [1]
T3	160 - 140	ROHN 1.5 STD	9.931	4.819	92.9 K=1.00	0.799	-6.597	19.143	0.345 [1]
T4	140 - 120	ROHN 2 STD	12.014	5.819	88.7 K=1.00	1.075	-6.927	27.195	0.255 [1]
T5	120 - 100	ROHN 2 STD	13.833	6.685	101.9 K=1.00	1.075	-7.131	22.627	0.315 [1]
T6	100 - 80	ROHN 2 STD	16.250	7.893	120.3 K=1.00	1.075	-6.966	16.764	0.416 [1]
T7	80 - 60	ROHN 2.5 STD	18.792	9.120	115.5 K=1.00	1.704	-7.732	28.852	0.268 [1]
T8	60 - 40	ROHN 2.5 STD	21.292	10.370	131.3 K=1.00	1.704	-8.260	22.315	0.370 [1]
T9	40 - 20	ROHN 2.5 STD	23.859	11.654	147.6	1.704	-8.305	17.669	0.470 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 3 STD	25.177	12.313	K=1.00 127.0 K=1.00	2.228	-9.450	31.224	0.303 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4 KL/R > 200 (C) - 4	8.500	8.010	245.8 K=1.00	0.938	-0.380	3.506	0.108 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	5.935	145.4 K=1.00	0.520	-4.968	5.558	0.894 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	2L2x2x1/4x1/4	11.466	10.909	215.0 K=1.00	1.875	-4.525	9.164	0.494 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	6.294	154.2 K=1.00	0.520	-0.031	4.941	0.006 [1]

[1] $P_u / \phi P_n$ controls

Redundant Hip Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 2.5 STD	15.046	15.046	190.6 K=1.00	1.704	-0.085	10.600	0.008 [1]

[1] $P_u / \phi P_n$ controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	4.264	4.264	128.7 K=1.00	0.484	-0.007	6.529	0.001 [1]
T3	160 - 140	L2x2x1/8	4.271	4.271	128.9 K=1.00	0.484	-0.009	6.511	0.001 [1]
T4	140 - 120	L2x2x1/8	6.007	6.007	181.3 K=1.00	0.484	-0.007	3.328	0.002 [1]
T5	120 - 100	L2x2x1/8	6.917	6.917	208.8 K=1.00	0.484	-0.009	2.510	0.004 [1]
T6	100 - 80	L2 1/2x2 1/2x3/16	8.125	8.125	197.0 K=1.00	0.902	-0.011	5.252	0.002 [1]
T7	80 - 60	L3x3x3/16	9.396	9.396	189.2 K=1.00	1.090	-0.013	6.881	0.002 [1]
T8	60 - 40	L3 1/2x3 1/2x1/4	10.646	10.646	184.1 K=1.00	1.690	-0.015	11.267	0.001 [1]
T9	40 - 20	L3 1/2x3 1/2x1/4	11.930	11.930	206.3 K=1.00	1.690	-0.017	8.973	0.002 [1]
T10	20 - 0	ROHN 3 STD	12.589	12.589	129.8 K=1.00	2.228	-0.018	29.869	0.001 [1]

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	ROHN 2.5 STD	5.000	5.000	63.3	1.704	1.306	76.682	0.017 [1]
T2	180 - 160	ROHN 2.5 STD	20.000	6.667	84.4	1.704	22.002	76.682	0.287 [1]
T3	160 - 140	ROHN 3 X-STR	20.036	6.679	70.5	3.016	67.539	135.717	0.498 [1]
T4	140 - 120	ROHN 4 X-STR	20.036	6.679	54.3	4.407	108.488	198.335	0.547 [1]
T5	120 - 100	ROHN 5 X-STR	20.042	10.021	65.4	6.112	138.111	275.039	0.502 [1]
T6	100 - 80	ROHN 5 X-STR	20.056	10.028	65.4	6.112	168.419	275.039	0.612 [1]
T7	80 - 60	ROHN 6 EHS	20.052	10.026	54.1	6.713	195.013	302.097	0.646 [1]
T8	60 - 40	ROHN 6 X-STR	20.052	10.026	54.8	8.405	220.576	378.222	0.583 [1]
T9	40 - 20	ROHN 6 X-STR	20.058	10.029	54.8	8.405	244.186	378.222	0.646 [1]
T10	20 - 0	ROHN 8 EHS	20.052	0.084	0.3	9.719	278.506	437.369	0.637 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4	9.862	4.667	94.4	0.586	1.729	28.583	0.060 [1]
T2	180 - 160	ROHN 2 STD	7.917	7.695	117.3	1.075	10.494	48.354	0.217 [1]
T3	160 - 140	ROHN 2 STD	8.315	8.081	123.2	1.075	11.242	48.354	0.232 [1]
T4	140 - 120	ROHN 2 STD	8.747	8.476	129.2	1.075	10.356	48.354	0.214 [1]
T5	120 - 100	ROHN 2.5 STD	12.163	11.776	149.2	1.704	12.065	76.682	0.157 [1]
T6	100 - 80	ROHN 2.5 STD	12.890	12.539	158.8	1.704	10.464	76.682	0.136 [1]
T7	80 - 60	ROHN 2.5 STD	14.162	13.772	174.4	1.704	10.752	76.682	0.140 [1]
T8	60 - 40	ROHN 2.5 X-STR	15.072	14.703	190.9	2.254	10.905	101.409	0.108 [1]
T9	40 - 20	ROHN 3 STD	16.082	15.729	162.2	2.228	10.604	100.281	0.106 [1]
T10	20 - 0	ROHN 3 STD	24.260	12.130	125.1	2.228	16.855	100.281	0.168 [1]

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	ROHN 1.5 STD	8.528	4.144	79.9	0.799	5.708	35.976	0.159 [1]
T3	160 - 140	ROHN 1.5 STD	9.236	4.472	86.2	0.799	6.718	35.976	0.187 [1]
T4	140 - 120	ROHN 2 STD	12.014	5.819	88.7	1.075	6.971	48.354	0.144 [1]
T5	120 - 100	ROHN 2 STD	13.833	6.685	101.9	1.075	7.131	48.354	0.147 [1]
T6	100 - 80	ROHN 2 STD	16.250	7.893	120.3	1.075	6.922	48.354	0.143 [1]
T7	80 - 60	ROHN 2.5 STD	18.792	9.120	115.5	1.704	7.754	76.682	0.101 [1]
T8	60 - 40	ROHN 2.5 STD	21.292	10.370	131.3	1.704	8.394	76.682	0.109 [1]
T9	40 - 20	ROHN 2.5 STD	23.859	11.654	147.6	1.704	8.631	76.682	0.113 [1]
T10	20 - 0	ROHN 3 STD	25.177	12.313	127.0	2.228	9.455	100.281	0.094 [1]

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/4	8.500	8.010	162.8	0.586	0.529	28.583	0.019 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	5.935	145.4	0.520	4.968	23.411	0.212 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	2L2x2x1/4x1/4	11.466	10.909	215.0	1.875	4.525	84.375	0.054 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 1.5 x 11GA	6.294	6.294	154.2	0.520	0.019	23.411	0.001 [1]

[1] P_u / ϕP_n controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	ROHN 2.5 STD	15.046	15.046	190.6	1.704	0.074	76.682	0.001 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	4.264	4.264	81.7	0.484	0.007	15.694	0.000 [1]
T3	160 - 140	L2x2x1/8	4.271	4.271	81.8	0.484	0.007	15.694	0.000 [1]
T4	140 - 120	L2x2x1/8	5.313	5.313	101.8	0.484	0.006	15.694	0.000 [1]
T5	120 - 100	L2x2x1/8	6.354	6.354	121.8	0.484	0.003	15.694	0.000 [1]
T6	100 - 80	L2 1/2x2 1/2x3/16	7.479	7.479	115.4	0.902	0.001	29.225	0.000 [1]
T7	80 - 60	L3x3x3/16	8.771	8.771	112.1	1.090	0.000	49.050	0.000 [1]

[1] P_u / ϕP_n controls

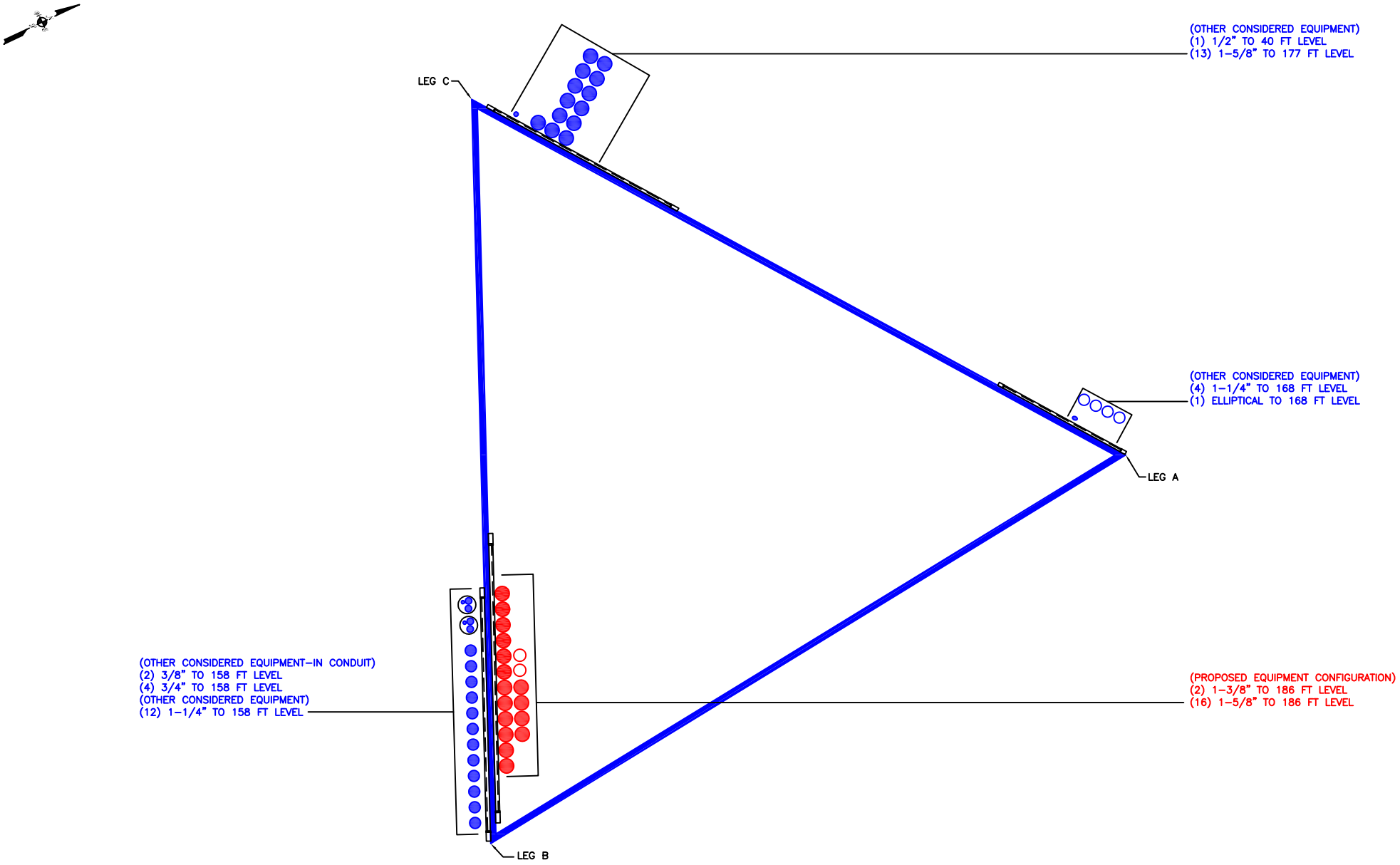
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	185 - 180	Leg	ROHN 2.5 STD	2	-5.445	57.192	9.5	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	15	-29.214	45.528	64.2	Pass
T3	160 - 140	Leg	ROHN 3 X-STR	54	-79.112	94.336	83.9	Pass
T4	140 - 120	Leg	ROHN 4 X-STR	93	-122.375	159.904	76.5	Pass
T5	120 - 100	Leg	ROHN 5 X-STR	132	-154.293	201.195	76.7	Pass
T6	100 - 80	Leg	ROHN 5 X-STR	159	-187.502	201.111	93.2	Pass
T7	80 - 60	Leg	ROHN 6 EHS	186	-217.308	243.965	89.1	Pass
T8	60 - 40	Leg	ROHN 6 X-STR	213	-246.654	303.623	81.2	Pass
T9	40 - 20	Leg	ROHN 6 X-STR	240	-274.421	303.585	90.4	Pass
T10	20 - 0	Leg	ROHN 8 EHS	267	-286.162	386.706	74.0	Pass
T1	185 - 180	Diagonal	L2x2x1/4	10	-1.961	10.330	19.0	Pass
							20.2 (b)	
T2	180 - 160	Diagonal	ROHN 2 STD	21	-10.567	17.637	59.9	Pass
T3	160 - 140	Diagonal	ROHN 2 STD	72	-11.327	15.994	70.8	Pass
T4	140 - 120	Diagonal	ROHN 2 STD	99	-10.156	13.067	77.7	Pass
T5	120 - 100	Diagonal	ROHN 2.5 STD	138	-12.016	16.376	73.4	Pass
T6	100 - 80	Diagonal	ROHN 2.5 STD	165	-10.587	14.297	74.0	Pass
T7	80 - 60	Diagonal	ROHN 2.5 STD	192	-11.071	12.652	87.5	Pass
T8	60 - 40	Diagonal	ROHN 2.5 X-STR	219	-11.361	13.964	81.4	Pass
T9	40 - 20	Diagonal	ROHN 3 STD	246	-11.132	19.132	58.2	Pass
T10	20 - 0	Diagonal	ROHN 3 STD	279	-17.821	32.170	55.4	Pass
T2	180 - 160	Horizontal	ROHN 1.5 STD	19	-5.640	22.564	25.0	Pass
T3	160 - 140	Horizontal	ROHN 1.5 STD	58	-6.597	19.143	34.5	Pass
T4	140 - 120	Horizontal	ROHN 2 STD	97	-6.927	27.195	25.5	Pass
							28.1 (b)	
T5	120 - 100	Horizontal	ROHN 2 STD	136	-7.131	22.627	31.5	Pass
T6	100 - 80	Horizontal	ROHN 2 STD	163	-6.966	16.764	41.6	Pass
T7	80 - 60	Horizontal	ROHN 2.5 STD	190	-7.732	28.852	26.8	Pass
							31.2 (b)	
T8	60 - 40	Horizontal	ROHN 2.5 STD	217	-8.260	22.315	37.0	Pass
T9	40 - 20	Horizontal	ROHN 2.5 STD	244	-8.305	17.669	47.0	Pass
T10	20 - 0	Horizontal	ROHN 3 STD	275	-9.450	31.224	30.3	Pass
T1	185 - 180	Top Girt	L2x2x1/4	4	-0.380	3.506	10.8	Pass
T10	20 - 0	Redund Horz 1 Bracing	ROHN 1.5 x 11GA	280	-4.968	5.558	89.4	Pass
T10	20 - 0	Redund Diag 1	2L2x2x1/4x1/4	281	-4.525	9.164	49.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T10	20 - 0	Bracing Redund Hip 1 Bracing	ROHN 1.5 x 11GA	282	-0.031	4.941	0.6	Pass
T10	20 - 0	Redund Hip Diagonal 1 Bracing	ROHN 2.5 STD	294	-0.085	10.600	0.8	Pass
T2	180 - 160	Inner Bracing	L2x2x1/8	27	-0.006	6.529	0.5	Pass
T3	160 - 140	Inner Bracing	L2x2x1/8	66	-0.006	4.871	0.6	Pass
T4	140 - 120	Inner Bracing	L2x2x1/8	105	-0.007	3.328	0.7	Pass
T5	120 - 100	Inner Bracing	L2x2x1/8	144	-0.009	2.510	0.8	Pass
T6	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	171	-0.011	5.252	0.6	Pass
T7	80 - 60	Inner Bracing	L3x3x3/16	198	-0.013	6.881	0.5	Pass
T8	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	225	-0.015	11.267	0.4	Pass
T9	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	252	-0.017	8.973	0.5	Pass
T10	20 - 0	Inner Bracing	ROHN 3 STD	297	-0.018	29.869	0.2	Pass
							Summary	
						Leg (T6)	93.2	Pass
						Diagonal (T7)	87.5	Pass
						Horizontal (T9)	47.0	Pass
						Top Girt (T1)	10.8	Pass
						Redund Horz 1 Bracing (T10)	89.4	Pass
						Redund Diag 1 Bracing (T10)	49.4	Pass
						Redund Hip 1 Bracing (T10)	0.6	Pass
						Redund Hip Diagonal 1 Bracing (T10)	0.8	Pass
						Inner Bracing (T5)	0.8	Pass
						Bolt Checks	69.3	Pass
						RATING =	**93.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806362 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIplate

Project Information

BU #	806362
Site Name	NHV 108 943133
Order #	1628360

Tower Information

Tower Type	Self Support
TIA-222 Rev	G

Applied Loads

	Comp.	Uplift
Axial (k)	313.00	277.00
Shear (k)	37.00	37.00

Anchor Rod Data

Quantity:	8
Diameter (in):	1
Material Grade:	A449
Grout Considered:	Yes
l_{ar} (in):	1.5
Eta Factor, η:	0.5
Thread Type:	N-Included
Configuration:	Symmetrical

Bending Int

Anchor Rod Results

Axial, Pu (kips)	39.13
Shear, Vu (kips)	4.63
Moment, Mu (kip-in)	-
Axial Cap., ϕPn (kips)	58.18
Shear Cap., ϕVn (kips)	-
Moment Cap., ϕMn (kip-in)	-
Stress Rating	83.2%

Pass

Pier and Pad Foundation

BU # :	806362
Site Name:	NHV 108 943133
App. Number:	446207 Rev. 1

TIA-222 Revision:	G
Tower Type:	Self Support

Block Foundation?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	313	kips
Compression Shear, Vu_comp:	37	kips
Uplift, P_{uplift}:	277	kips
Uplift Shear, V_{u_uplift}:	34	kips
Tower Height, **H**:	185	ft
Base Face Width, **BW**:	27.68	ft
BP Dist. Above Fdn, bp_{dist}:	0	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Uplift (kips)	944.35	277.00	**29.3%**	**Pass**
Lateral (Sliding) (kips)	445.04	34.00	**7.6%**	**Pass**
Bearing Pressure (ksf)	18.00	6.18	**34.3%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	1153.73	407.00	**35.3%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	878.96	374.00	**42.6%**	**Pass**
Pier Compression (kip)	2325.54	330.82	**14.2%**	**Pass**
*Pad Flexure (kip*ft)*	513.41	149.02	**29.0%**	**Pass**
Pad Shear - 1-way (kips)	169.84	44.51	**26.2%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.066	**39.9%**	**Pass**

Soil Rating:	**34.3%**
Structural Rating:	**42.6%**

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	3	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	16	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	13	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	12.5	ft
Pad Width, **W**:	8.75	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size, **Sp**:	7	
Pad Rebar Quantity, **mp**:	10	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	135	pcf
Ultimate Gross Bearing, Qult:	24.000	ksf
Cohesion, **Cu**:	7.000	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.4	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

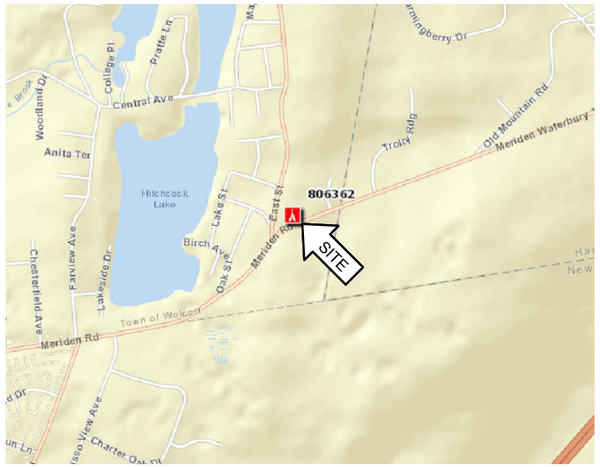
APPENDIX D

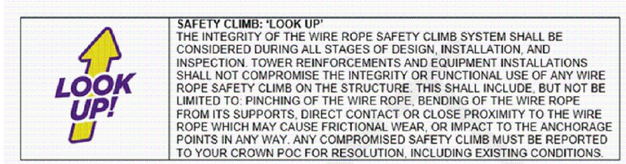
MODIFICATION DRAWINGS

TOWER REINFORCEMENT DRAWINGS PREPARED FOR CROWN CASTLE

SITE NAME: NHV 108 943133
BU NUMBER: 806362

SITE ADDRESS:
INTERSECTION OF RTE 322/ MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA





PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
   DAN VADNEY
   518-373-3510
   Dan.Vadney@crowncastle.com

2. CROWN CONSTRUCTION MANAGER
   JASON D'AMICO
   860-209-0104
   Jason.DAmico@crowncastle.com

3. DESIGN ENGINEER - MAIN RFI CONTACT
   PHILIP LIN
   919-859-5758
   Philip.Lin@jacobs.com

4. ENGINEER OF RECORD
   PAUL L. MUCCI, PE
   120 ST JAMES AVENUE,
   5TH FLOOR
   BOSTON, MA 02116
   Paul.Mucci@jacobs.com

5. FOR FABRICATION AND CONSTRUCTION RELATED INQUIRIES: CONTACT **MOD_NTP@JACOBS.COM,** DESIGN ENGINEER, AND ENGINEER OF RECORD.

DRAWINGS INCLUDED

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
T-1	TITLE SHEET		
N-1	MODIFICATION INSPECTION CHECKLIST		
N-2	NOTES		
N-2A	NOTES (CONTINUED)		
S-1	TOWER MODIFICATION SCHEDULE		
S-2	REDUNDANT DIAGONAL REPLACEMENT DETAILS		
S-3	EXTENSION INSTALLATION DETAILS I		
S-4	EXTENSION INSTALLATION DETAILS II		
S-5	FABRICATION AND INSTALLATION DETAILS		

TOWER INFORMATION

TOWER MANUFACTURER / DWG #: ROHN / DWG #: A861188

TOWER HEIGHT / TYPE:		180 FT SELF SUPPORT TOWER
TOWER LOCATION:	LAT:	41° 33′ 34.41″
DATUM: (NAD 1983)	LONG:	-72° 56′ 49.10″
STRUCTURAL DESIGN DRAWING:		JACOBS / WO # 1628360
STRUCTURAL ANALYSIS REPORT:		JACOBS / WO # 1600275
STRUCTURAL ANALYSIS DATE:		08/06/2018
ORDER NUMBER:		446207 REV. 1
CCISITES DOCUMENT ID:		7713570

CODE COMPLIANCE

ANSI/TIA-222-G-2005 WITH ADDENDA 1 THROUGH 4

2016 CONNECTICUT STATE BUILDING CODE

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

HOT WORK INCLUDED

N/A	BASE GRINDING ONLY
N/A	BASE WELDING (AND GRINDING)
N/A	AERIAL GRINDING ONLY
N/A	AERIAL WELDING (AND GRINDING)

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133
BU NUMBER: 806362
WO NUMBER: 1628360
SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL
CHECKED BY: DMC
APPROVED BY: PLM
SCALE: N.T.S

TITLE SHEET

T-1 | REV 0

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			
N/A	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
N/A	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
N/A	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
N/A	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
N/A	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 ENG-BUL-10149	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
N/A	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
N/A	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
X	BOLT INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
"X" OR "N/A"			

MODIFICATION INSPECTION NOTES

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS; IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS; AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

ALL MI'S SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-LST-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (POC).

REFER TO CROWN CED-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

SERVICE LEVEL COMMITMENT

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO CROWN DOCUMENT # CED-SOW-10007.

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

SCALE: N.T.S

MODIFICATION INSPECTION CHECKLIST

N-1

REV 0

GENERAL NOTES:

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE (UNO). THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH THE WORK IS TO BE PERFORMED.

2. 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 STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

3. THE NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS. STRUCTURAL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET.

4. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTORS PERFORMING THOSE TRADES SHALL BE LICENSED, RESEARCH AND COMPLY WITH LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.

5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE JACOBS ENGINEERING ENGINEER OF RECORD (EOR) AND TOWER OWNER FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST OR OF DIFFICULTIES OF CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS GOVERNING THE WORK.

6. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.

7. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODES. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.

8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

9. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. THESE REGULATIONS INCLUDE BUT ARE NOT LIMITED TO REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATIONS AND TRENCHING, ERECTION OF GUARDS AND BARRIERS, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES DURING CONSTRUCTION.

11. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR. THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.

13. STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE THE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.

14. DO NOT SCALE DRAWINGS.

15. FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.

16. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.

17. THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF YOUR CROWN POC. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE ENGINEER OF RECORD. IF THE GENERAL CONTRACTOR FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GENERAL CONTRACTOR SHALL CONTACT THE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.

18. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GENERAL CONTRACTOR AND/OR FABRICATOR.

19. AT THE TIME OF NTP, THE CONTRACTOR IS RESPONSIBLE FOR ENGAGING A MODIFICATION INSPECTOR TO COORDINATE AN INSPECTION SCHEDULE AND ENSURE PROPER DOCUMENTATION IS MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT. FOUNDATION WORK REQUIRES INSPECTION PRIOR TO POURING CONCRETE. SHOP DRAWINGS ARE TO BE SUBMITTED TO THE EOR PRIOR TO FABRICATION.

20. IF, DURING THE COURSE OF A FOUNDATION MODIFICATION, THE GC ENCOUNTERS EXISTING CONDUIT LOCATED WITHIN THE CONFINES OF THE EXISTING OR PROPOSED FOUNDATION CONCRETE, AND THIS CONDUIT IS NOT IN A LOCATION THAT IS SPECIFIED WITHIN THESE DESIGN DRAWINGS, THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE BEFORE PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATION. IF CONDUIT IS TO BE INSTALLED THROUGH THE EXISTING FOUNDATION OR PROPOSED FOUNDATION MODIFICATION AND HASN'T BEEN SPECIFIED WITHIN THESE DESIGN DRAWINGS THEN THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE PRIOR TO PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATIONS.

STRUCTURAL STEEL NOTES:

1. DESIGN, FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO):

   A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

   B. TIA-322: LOADING, ANALYSIS, AND DESIGN CRITERIA RELATED TO THE INSTALLATION, ALTERATION AND MAINTENANCE OF COMMUNICATION STRUCTURES.

   C. AISC: MANUAL OF STEEL CONSTRUCTION

2. ALL STRUCTURAL STEEL IS TO BE NEW AND CONFORM TO THE FOLLOWING:

   A. MONOPOLE: ASTM A572-65 (FY = 65 KSI), UNO

   B. SELF SUPPORT TOWER AND GUYED TOWER: ASTM A572-50 (FY = 50 KSI), UNO

3. ALL BOLTS SHALL BE HOT-DIP GALVANIZED ASTM A325 ASSEMBLIES, TO INCLUDE BOLT, ASTM A563 HEAVY HEX NUT, F436 FLAT WASHER, AND SPLIT LOCK WASHER, UNO. BOLT THREADS ARE TO BE EXCLUDED FROM THE SHEAR PLANES. USE BEARING TYPE CONNECTIONS. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

4. ALL FASTENERS SHALL NOT BE REUSED.

5. DRILL NO HOLES IN ANY NEW OR EXISTING STRUCTURAL STEEL MEMBERS OTHER THAN THOSE SHOWN ON STRUCTURAL DRAWINGS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD.

6. ALL EXPOSED EXTERIOR STRUCTURAL STEEL (INCLUDING BOLTS, LOCK WASHERS, PINS, ETC.) SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 AND A123. FOR ALL FABRICATED WELDED ASSEMBLIES TO BE HOT-DIP GALVANIZED, PROVIDE WELDS ALL AROUND OR ADD SEAL WELDS WHERE STRUCTURAL WELDS ARE NOT SPECIFIED. FOR HIGH STRENGTH STEEL FASTENERS WHERE HOT-DIP GALVANIZATION IS NOT PERMITTED, MAGNI 565 COATING SHALL BE USED. ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING TOWER STEEL.

7. WHERE SPECIFIED, THE SEALANT BETWEEN STEEL COMPONENTS IS TO BE SILICONE CAULKING THAT IS EXTERIOR GRADE, ABLE TO BE PAINTED, AND ACCEPTABLE TO THE ENGINEER OF RECORD.

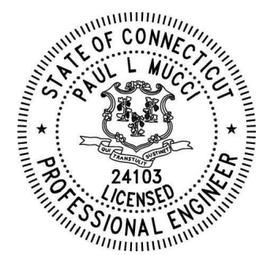
8. FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, " TOWER PROTECTIVE COATINGS BULLETIN".

9. AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

10. NO WELDING, TORCH CUTTING, OR OPEN FLAME IS PERMITTED ON THIS CONSTRUCTION SITE UNLESS DIRECTLY SPECIFIED IN THE DRAWINGS.

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

JACOBS
Jacobs Engineering Group. Inc.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

SCALE: N.T.S

NOTES

N-2

REV 0

WELDING NOTES:

1. ALL WELDING SHALL BE CARRIED OUT UNDER GOOD OPERATOR CONDITIONS AS DEFINED IN SECTION 5.12 OF AWS D1.1

2. ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.

3. THE CWI SHALL INDICATE, IN A WRITTEN WELDING REPORT, THAT ALL WELDING OPERATIONS, PRE-DURING-POST, WERE CONDUCTED IN ACCORDANCE WITH AWS D1.1 INCLUDING PHOTOGRAPHS AND DOCUMENTATION SUPPORTING THE ACCEPTANCE OR REJECTION OF ALL WELDING. FOR INFORMATION, SEE CROWN ENG-STD-10069, "GC INSPECTION STANDARD FOR FABRICATION AND FIELD WELDING OF STRUCTURAL STEEL" AND CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW". ALL CWI WELDING INSPECTION DOCUMENTATION AND PHOTOS SHALL BE SUBMITTED TO THE MI INSPECTOR.

4. FOR ALL WELDING, USE E70XX ELECTRODES, UNO.

5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.

6. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.

7. DO NOT WELD ON WET OR FROST-COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

8. WELDING NDE NOTES: “FIELD NDE MINIMUM REQUIREMENTS:

   A. ALL NDE SHALL BE IN ACCORDANCE WITH AWS D1.1.

   B. FOR NEW BASE STIFFENERS (INCLUSIVE OF TRANSITION STIFFENERS) AND ANCHOR ROD BRACKETS, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT.

   C. FOR NEW FLAT PLATE REINFORCEMENT AT THE BASE OF THE TOWER, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT, BUT MAY BE LIMITED TO A HEIGHT OF 10’-0”.

   D. FOR NDE OF THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, GC SHALL REFERENCE THE MI CHECKLIST FOR APPLICABILITY. PLEASE SEE ENG-SOW-10033: TOWER BASE PLATE NDE, AND ENG-BUL-10051: NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE.

   E. ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT."

BOLT-TIGHTENING PROCEDURE:

1. TIGHTEN CONNECTION BOLTS BY AISC - "TURN OF THE NUT" METHOD, USING THE CHART BELOW.
   BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETER
   1/2" BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   5/8" BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   3/4" BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   7/8" BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1 1/4" BOLTS UP TO AND INCLUDING 5.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1 1/2" BOLTS UP TO AND INCLUDING 6.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT

   BOLT LENGTHS OVER FOUR DIAMETER BUT NOT EXCEEDING EIGHT DIAMETER
   1/2" BOLTS 2.25 TO 4.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   5/8" BOLTS 2.75 TO 5.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   3/4" BOLTS 3.25 TO 6.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   7/8" BOLTS 3.75 TO 7.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1" BOLTS 4.25 TO 8.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1 1/4" BOLTS 5.5 TO 10.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1 1/2" BOLTS 6.5 TO 12.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(d)(1) OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

   8(d)(1) TURN-OF-THE-NUT TIGHTENING METHOD
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c), UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(d)(1) THROUGH 8(d)(4).

4. ALL OTHER BOLTED CONNECTIONS, INCLUDING U-BOLTS, SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c) OF THE SPECIFICATION.

5. TURN-OF-THE-NUT AND SNUG-TIGHT TIGHTENING METHOD DOES NOT APPLY TO THE FORGBOLT, NEXGEN2, OR AJAX BOLTS.

6. TURN-OF-THE-NUT MARKINGS TO BE INCLUDED IN THE MODIFICATION INSPECTION REPORT.

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE
322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

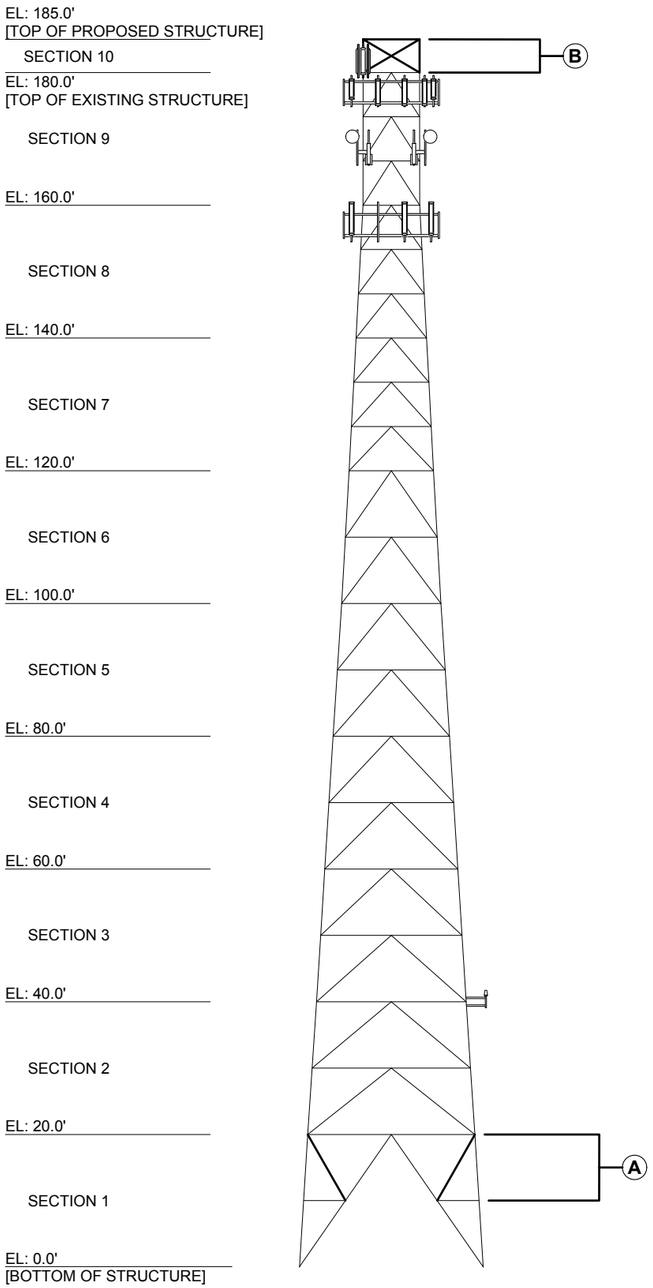
APPROVED BY: PLM

SCALE: N.T.S

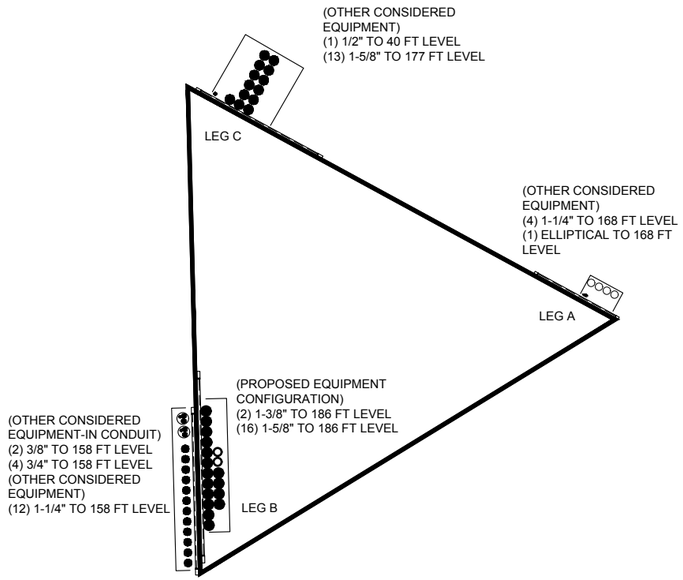
NOTES
(CONTINUED)

N-2A

REV
0



TOWER ELEVATION VIEW



TOWER BASE LEVEL VIEW

MODIFICATION SCHEDULE

LETTER	ELEVATION (FT)	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEET
A	20.0 TO 10.0	**INSTALL NEW REPLACEMENT REDUNDANT DIAGONALS**	S-2 & S-5
B	185.0 TO 180.0	**INSTALL NEW SELF SUPPORT EXTENSION**	S-3 TO S-5
C	185.0 TO 3.0±	**INSTALL NEW 3/8" DIAMETER SAFETY CLIMB**	---

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTHS AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.

NOTES:

1. MODIFICATIONS TYPICAL FOR ALL TOWER FACES.
2. COAXIAL CABLES AND ANTENNAS CONFLICTING WITH PROPOSED REINFORCEMENT TO BE TEMPORARY RELOCATED. THE CONTRACTOR SHALL COORDINATE THE WORK WITH CROWN AND THE OWNER OF THE APPURTENANCES INVOLVED.

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

JACOBS
Jacobs Engineering Group. Inc.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

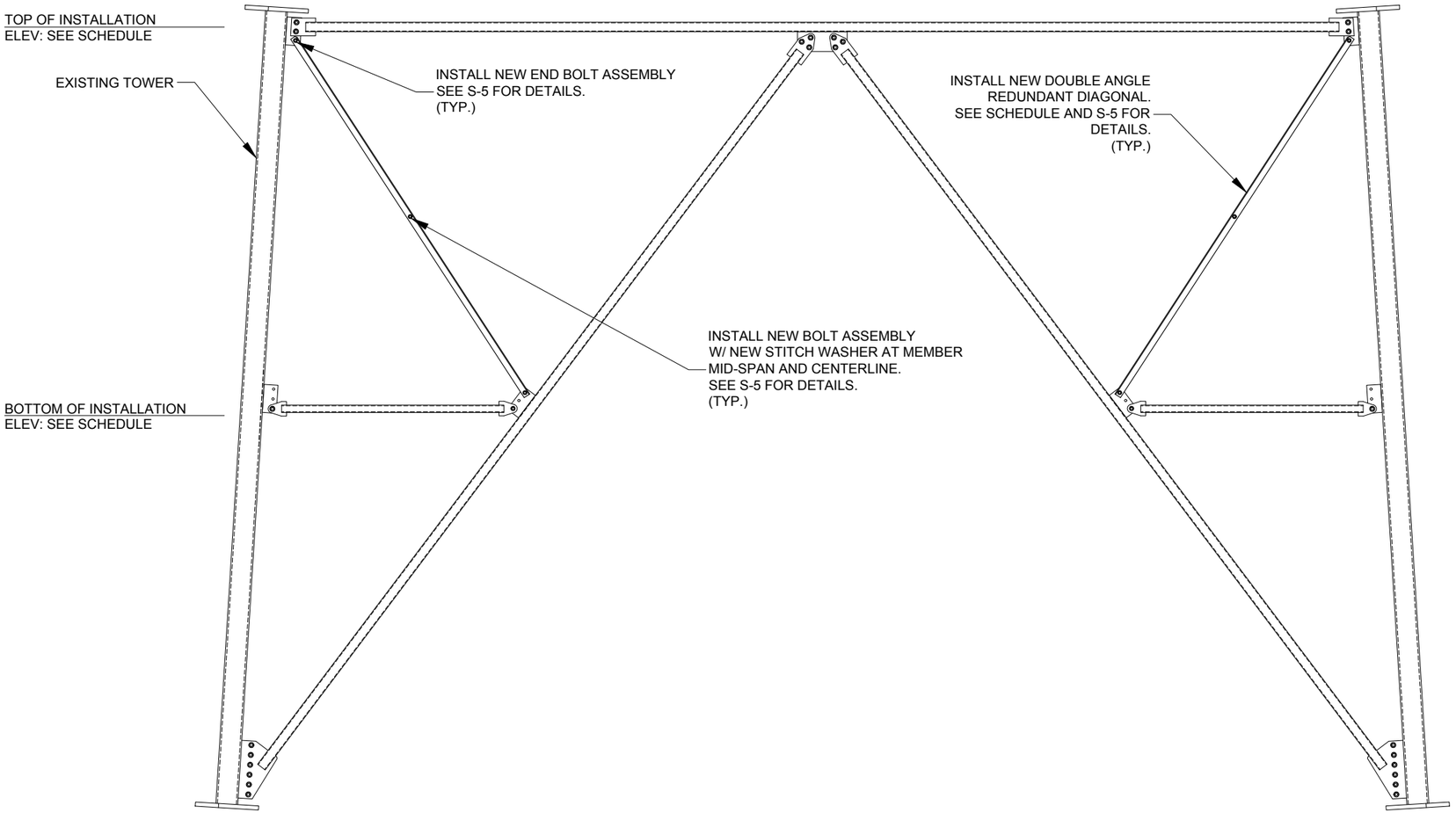
SCALE: N.T.S

TOWER MODIFICATION SCHEDULE

S-1

REV 0

REDUNDANT DIAGONAL SCHEDULE							
ELEVATION	EXISTING MEMBER	NEW MEMBER QTY / SIZE	ESTIMATED LENGTH	END BOLT QTY / SIZE	STITCH BOLT QTY / SIZE	BOLT GRADE	STITCH WASHER SPACER QTY.
20.0' TO 10.0'	PIPE 1.90" OD X 0.145"	(6) 2L 2" X 2" X 1/4"	11'-6"	(12) 5/8"Ø X 2"	(6) 5/8"Ø X 2"	A325X	6



REDUNDANT DIAGONAL REPLACEMENT

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE
322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

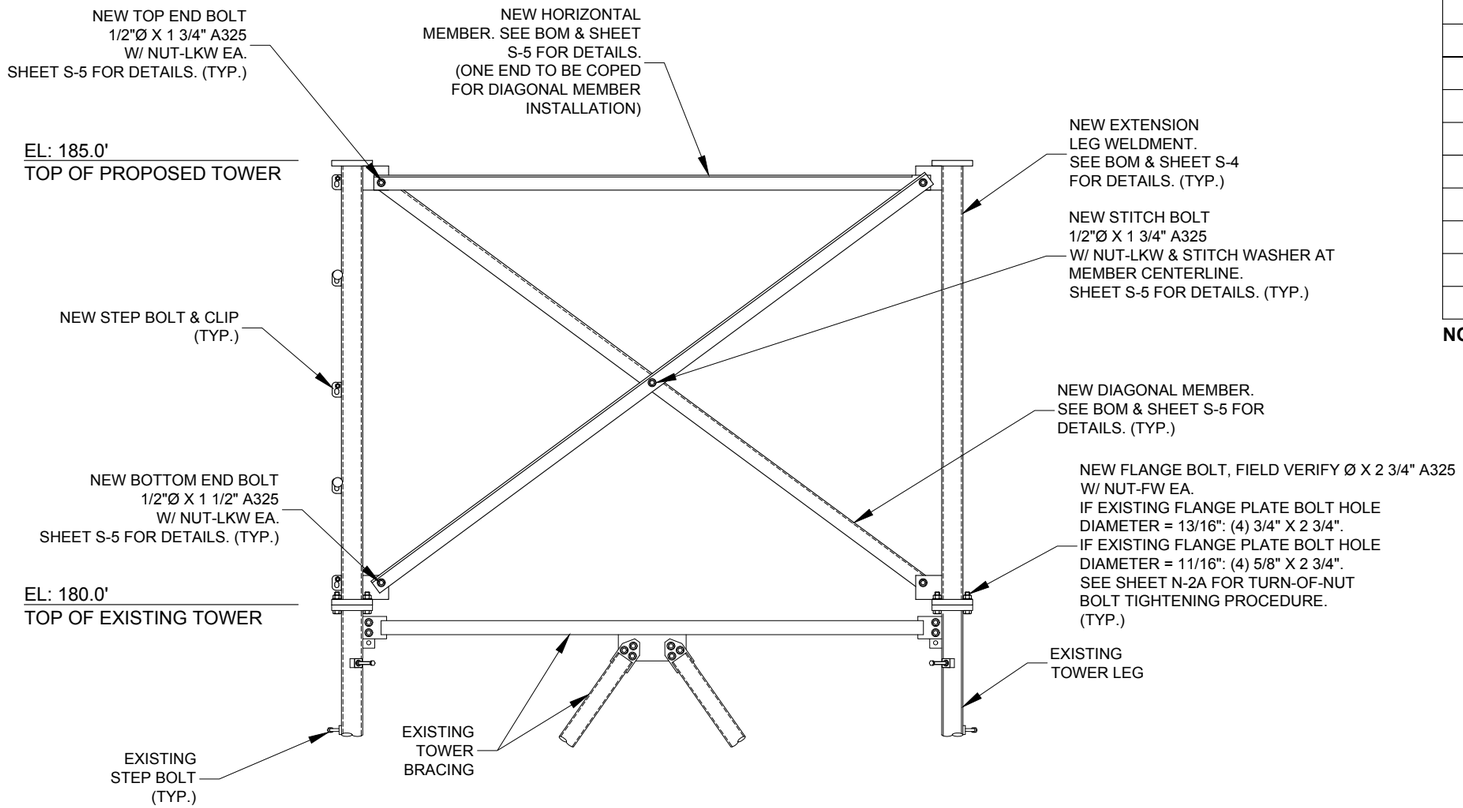
APPROVED BY: PLM

SCALE: N.T.S

REDUNDANT DIAGONAL REPLACEMENT DETAILS

S-2

REV 0



EXTENSION INSTALLATION DETAILS

EXTENSION BILL OF MATERIAL		
QUANTITY	**DESCRIPTION**	**GRADE**
3	EXTENSION LEG WELDMENT	SEE S-4
3	HORIZONTAL, L 2 X 2 X 1/4" X 8'-6" (APPROX. LENGTH)	A572-50
6	DIAGONAL, L 2 X 2 X 1/4" X 10'-0" (APPROX. LENGTH)	A572-50
6	TOP END BOLT, 1/2"Ø X 1 3/4"	ASTM A325
6	BOTTOM END BOLT, 1/2"Ø X 1 1/2"	ASTM A325
3	STITCH BOLT, 1/2"Ø X 1 3/4"	ASTM A325
5	STEP BOLT ASSEMBLY	SEE S-4
3	STITCH WASHER	ASTM A36
12	FLANGE BOLT, FIELD VERIFY Ø X 2 3/4"	ASTM A325
12	HEAVY HEX NUT	ASTM A563
12	HARDENED FLAT WASHER	ASTM F436

NOTE: ALL MATERIAL TO BE GALVANIZED

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE
322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

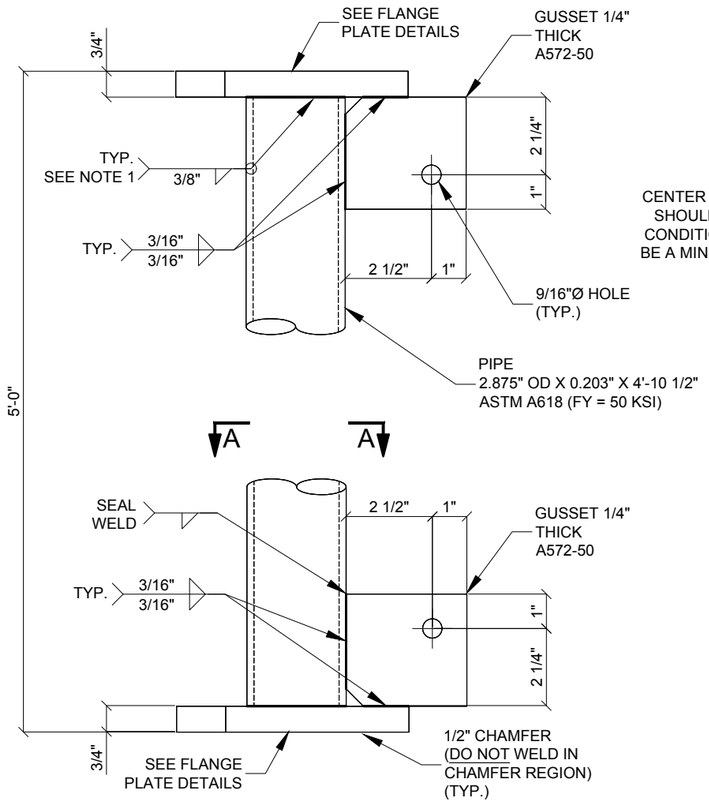
APPROVED BY: PLM

SCALE: N.T.S

EXTENSION INSTALLATION DETAILS I

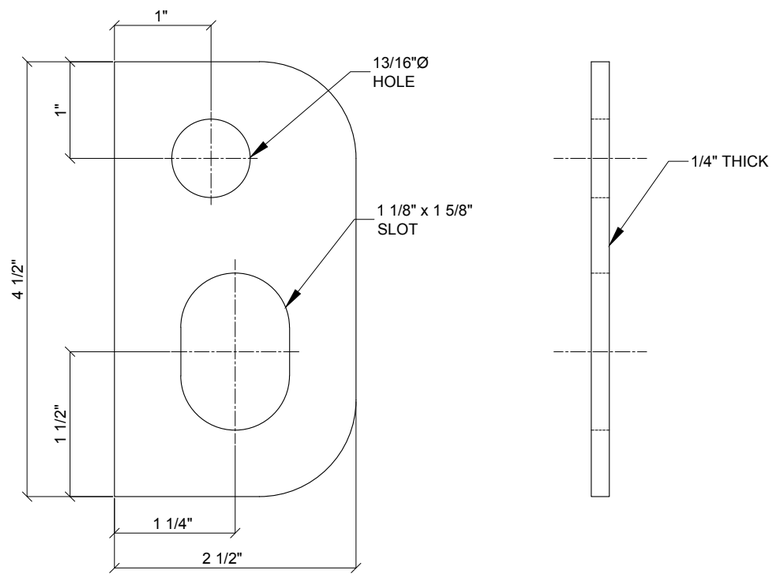
S-3

REV 0



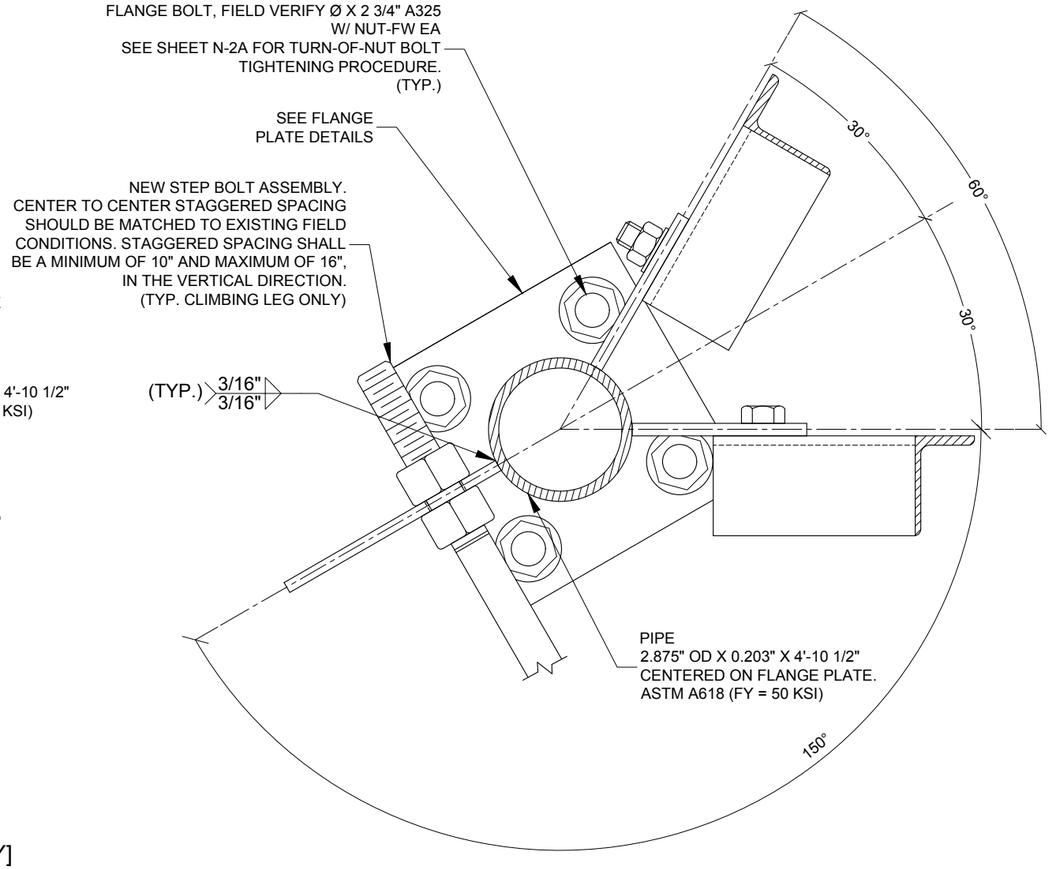
EXTENSION LEG WELDMENT

[NEW STEP BOLT ASSEMBLIES NOT SHOW FOR CLARITY]



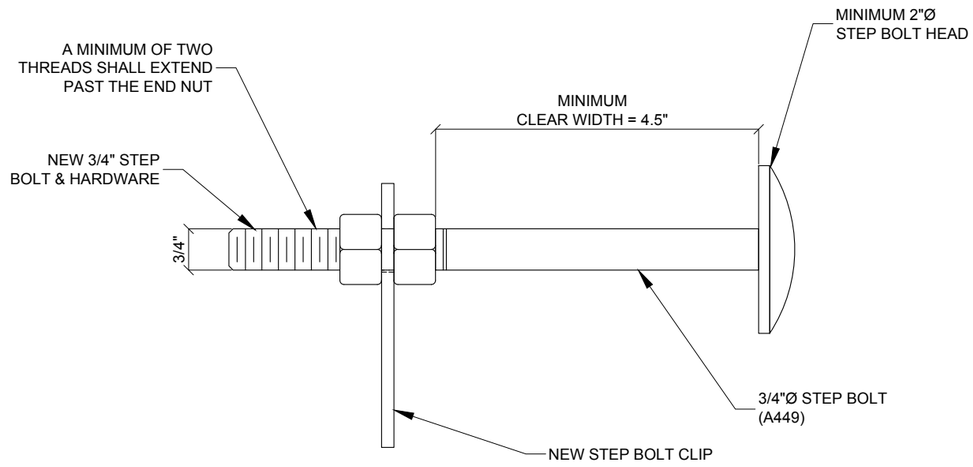
STEP BOLT CLIP WITH ANCHORAGE POINT (A572-50)

(FRONT & SIDE VIEW)



SECTION "A-A"

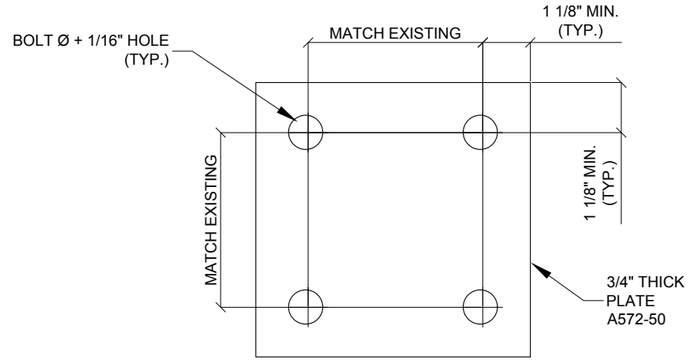
TOWER ORIENTATION DETAIL



STEP BOLT DETAIL

NOTES:

1. VERIFY DURING FABRICATION THAT WELD WILL NOT INTERFERE WITH NEW FLANGE BOLT NUT. CONTACT JACOBS IF INTERFERENCE EXISTS FOR ALTERNATE WELD DETAIL.
2. STEP BOLT CLIPS SHALL BE SHOP WELDED. STEP BOLT CLIP WELDS ARE SUBJECT TO AWS D1.1 AND MUST BE INSPECTED BY A CWI. REFER TO DOCUMENT "ENG-STD-10069 GC CWI REQUIREMENT STANDARD" FOR CWI REQUIREMENTS. STEP BOLT CLIPS SHALL BE WELDED IN PLACE PRIOR TO HOT DIP GALVANIZING THE WELDMENT.
3. CONTRACTOR SHALL USE ALL NEW STEP BOLTS AND HARDWARE. STEP BOLT MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM A449. STEP BOLTS SHALL BE INSTALLED USING DOUBLE NUTS. STEP BOLT NUTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION AND THEN ONE NUT SHALL BE PRETENSIONED BY ROTATING THE NUT AN ADDITIONAL 1/3 TURN. PLATE AND CLIP BOLT HOLES SHALL BE SHOP DRILLED OR PUNCHED.



FLANGE PLATE DETAILS

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

SITE NAME: NHV 108 943133

BU NUMBER: 806362

WO NUMBER: 1628360

SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL

CHECKED BY: DMC

APPROVED BY: PLM

SCALE: N.T.S

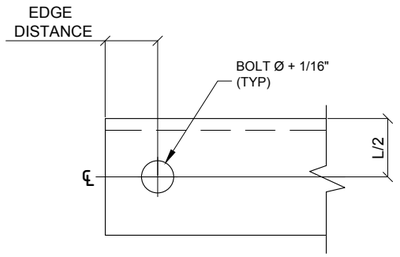
STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

EXTENSION INSTALLATION DETAILS II

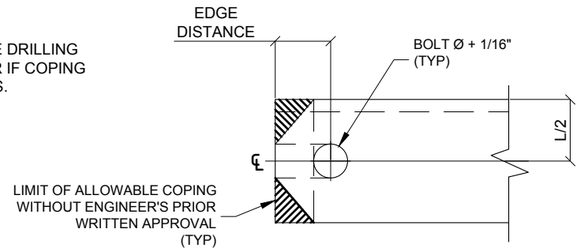
S-4

REV 0



NOTE:
VERIFY FIT UP BEFORE DRILLING HOLES. CONTACT EOR IF COPING INTERFERENCE EXISTS.

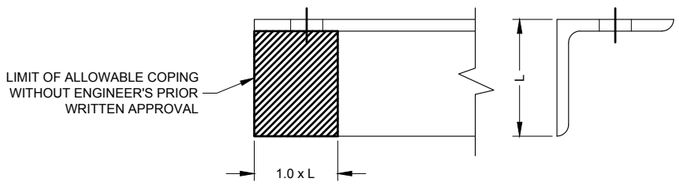
DIAGONAL & HORIZONTAL MEMBER BOLT HOLE PLACEMENT



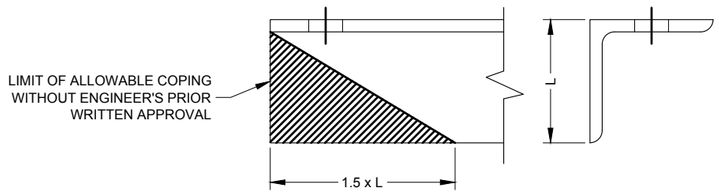
REDUNDANT DIAGONAL MEMBER BOLT HOLE PLACEMENT

NOTES:

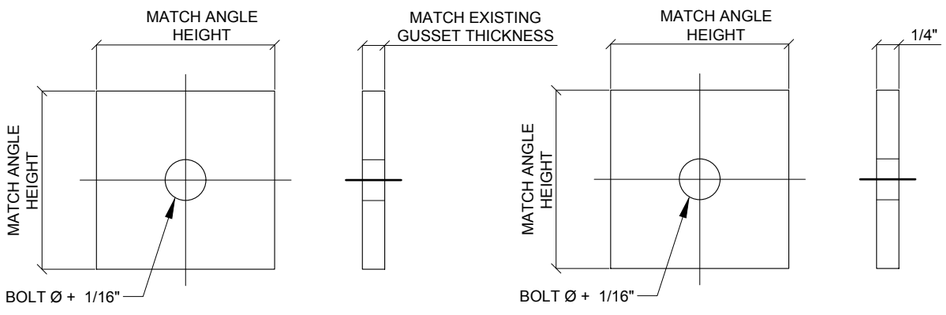
1. ALL HOLES SHALL BE DRILLED.
2. FIELD CUTTING AND DRILLING OF ANGLE MEMBERS IS PERMITTED.
3. ANGLES TO BE ASTM A572-50. MATERIAL TEST REPORTS ARE REQUIRED.
4. ALL STITCH WASHERS ARE TO BE NEW AND CONFORM TO THE FOLLOWING: ASTM A36 OR STRONGER MATERIAL.
5. ALL CONNECTION PLATES ARE TO BE NEW AND CONFORM TO THE FOLLOWING: ASTM A572-50 OR STRONGER MATERIAL.
6. ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE. FIELD DRILLED OR CUT MATERIAL TO BE COATED WITH TWO BRUSH COATS OF CROWN APPROVED ZINC RICH PAINT IN ACCI-BAORDANCE WITH ENG-BUL-10149 *TOWER PROTECTIVE COATINGS BULLETIN*.
7. ALL BOLTS SHALL BE HOT-DIP GALVANIZED ASTM A325 ASSEMBLIES, TO INCLUDE BOLT, HEAVY HEX NUT, AND SPLIT LOCK WASHER, UNO. USE BEARING TYPE CONNECTIONS, TIGHTEN TO A SNUG TIGHT CONDITION, UNO.



HORIZONTAL MEMBER COPING ALLOWANCES

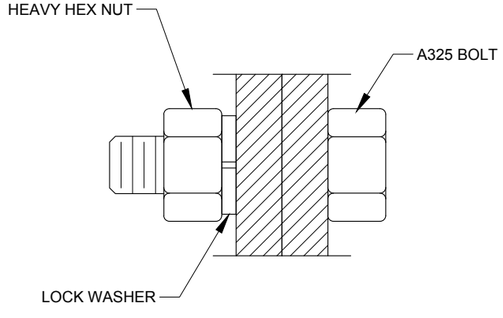


REDUNDANT DIAGONAL MEMBER COPING ALLOWANCES



REDUNDANT DIAGONAL STITCH WASHER

TOWER EXTENSION STITCH WASHER



TYPICAL BOLT ASSEMBLY

BOLT EDGE DISTANCE (UNLESS NOTED OTHERWISE)	
BOLT DIAMETER	MIN. EDGE
1/2"	1"
5/8"	1 1/4"

BOLT EDGE DISTANCE

NO.	DATE	DESCRIPTION	BY
0	10/10/18	FIRST ISSUE	PAL

REVISIONS

JACOBS
Jacobs Engineering Group. Inc.

STATE OF CONNECTICUT
PAUL L MUCCI
24103
LICENSED
PROFESSIONAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

SITE NAME: NHV 108 943133
BU NUMBER: 806362
WO NUMBER: 1628360
SITE ADDRESS:
INTERSECTION OF RTE 322/MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA

DRAWN BY: PAL
CHECKED BY: DMC
APPROVED BY: PLM
SCALE: N.T.S

FABRICATION AND INSTALLATION DETAILS

S-5

REV 0

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

November 20, 2018

William Stone
Real Estate Specialist
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

RE: **EM-T-MOBILE-166-181114** – T-Mobile notice of intent to modify an existing telecommunications facility located at 347 East Street, Wolcott, Connecticut.

Dear Mr. Stone:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on November 14, 2018.

According to Section 16-50j-71 of the Regulations of Connecticut State Agencies, "…any modification, as defined in Section 16-50j-2a of the Regulations of Connecticut State Agencies, to an existing tower site, except as specified in Sections 16-50j-72 and 16-50j-88 of the Regulations of Connecticut State Agencies, may have a substantial adverse environmental effect."

Staff has reviewed this exempt modification request for completeness and has identified a deficiency in the Structural Modification Report and Tower Reinforcement Drawings provided with the filing. The Structural Modification Report and Tower Reinforcement Drawings both prepared by Jacobs Engineering Group and both dated October 10, 2018 have not been signed by a Professional Engineer duly licensed in the State of Connecticut.

Therefore, the exempt modification request is incomplete at this time. The Council recommends that Crown Castle provide a Structural Modification Report and Tower Reinforcement Drawings that are signed by a Professional Engineer duly licensed in the State of Connecticut on or before December 24, 2018. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to December 24, 2018.

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/FOC/in

c: The Honorable Thomas G. Dunn, Mayor, Town of Wolcott
David Kalinowski, Zoning Inspector, Town of Wolcott