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
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

February 21, 2024

Kenneth C. Baldwin, Esq.
Robinson & Cole
280 Trumbull Street
Hartford, CT 06103-3597
kbaldwin@rc.com

RE: **SUBPETITION NO. 1133-VER-20230614** - Cellco Partnership d/b/a Verizon Wireless eligible facility request for modification to an existing telecommunications facility located at 97 High Street, Portland, Connecticut. **Request for Project Changes.**

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated February 21, 2024, regarding a change to the above-referenced Eligible Facility Request (EFR) that was approved by the Council on July 17, 2023.

Pursuant to Condition No. 1 of the Council's July 17, 2023 approval, your request to install antenna models MT6413-77A and RT4423 in lieu of MT6407-77A and CBRS; and remote radio head model RF4461-13A in lieu of model RF4440d-13A is hereby approved.

This approval applies only to the project changes described in your February 21, 2024 correspondence.

Please be advised that deviations from the standards established by the Council in the EFR approval are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/dll

c: The Honorable Ryan J. Curley, First Selectperson, Town of Portland (rcurley@portlandct.org)

Robinson+Cole

KENNETH C. BALDWIN

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Also admitted in Massachusetts
and New York

February 21, 2024

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

Re: **SUBPETITION NO. 1133-VER-20230614 – Cellco Partnership d/b/a Verizon Wireless eligible facility request for modification to an existing telecommunications facility at 97 High Street, Portland, Connecticut**

Minor Equipment Changes

Dear Attorney Bachman:

On behalf of Cellco Partnership d/b/a Verizon Wireless ("Cellco"), and pursuant to Conditions No. 1 of the Siting Council's decision in SUBPETITION NO. 1133-VER-20230614, I respectfully request staff approval of the following minor equipment changes at the SRR Towers, Inc. wireless facility at 97 High Street in Portland, Connecticut.

Due to equipment availability issues, Cellco will install antenna models MT6413-77A and RT4423[1] in lieu of models MT6407-77A and CBRS. Cellco will also be installing remote radio head (RRH) model RF4461-13A in lieu of model RF4440d-13A.

Attached is a revised set of project plans, specifications for the new antennas and RRHs, and an updated Structural Analysis Report and Antenna Mount Analysis Report confirming that the new tower and mounts are capable of supporting this new equipment. Please contact me if you have any questions or need any additional information.

[1] The RT4423 antenna includes a built-in RRH, which will replace RRH model RT4401-48A as originally approved.

Sincerely,

Kenneth C. Baldwin

Copy to:

SRR Towers, Inc.
Ryan Curley, Portland First Selectman
Tim Parks
Michael Humphreys

Structural Components
Bringing It All Together.

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221

Voice: 866-386-7622

February 13, 2024

BST Management, LLC
352 Park Street
Suite 106
North Reading, MA 01864

Re: Comprehensive Structural Analysis Report

Structure:	80.4ft Self-Supporting Tower with 10ft Extension
Site Address:	97 High Street, Portland, Connecticut 06480 (Middlesex County) Latitude: 41.5807°N, Longitude: 72.6238°W
Site Name:	BST Management, LLC – Portland Verizon – Portland
Site Number:	BST Management, LLC – CT-1680 Verizon – 469381
SC Number:	240022 REV 1
Status:	**Structure Passes (77% Capacity)** **Foundation Passes**

Per your request, Structural Components, LLC has completed a structural analysis for the above referenced project to verify the tower's compliance to the following design criteria:

Standard:	TIA-222-H *Structural Standard for Antenna Supporting Structures and Antennas*
Building Code:	2021 International Building Code w/Amendments 2022 Connecticut State Building Code
Design Basic Wind Speed without Ice:	120 mph 3-second gust V_{ULT}
Design Basic Wind Speed with Ice:	50 mph 3-second gust
Ice Thickness:	1" radial
Serviceability Basic Wind Speed:	60 mph 3-second gust
Exposure Category:	C
Topographic Category:	1
Ground Elevation:	345ft
Risk Category:	II
Seismic Site Class:	D, S_s=0.208, S_1=0.056
Seismic Design Category:	B

Please refer to the following structural analysis report, which gives complete details of the tower loading, results, information provided, and necessary assumptions.

We trust you find this report satisfactory. Please do not hesitate to contact us if you should have any questions or concerns.

Best Regards,
Structural Components LLC

Wesley Culver
Engineering Manager

/TR

STATE OF CONNECTICUT
MICHAEL T. DEBOER
No. 18022
LICENSED PROFESSIONAL ENGINEER

Michael Deboer, P.E.
Connecticut P.E. # 0018022

1 LOADING CONFIGURATION

The following antennas, mounts, transmission lines, and other appurtenances were considered for the structural analysis.

Elevation (ft)		Equipment	Feedlines	Notes
Mount	Equip			
90.5	90.5	(1) 5/8" x 6' Lightning Rod	—	Existing
90.0	**90.0**	**(3) CommScope NNH4-65B-R6 Panels** **(3) Samsung RT4423 Panels w/ RRU** **(3) Samsung MT6413-77A Panels** **(3) Samsung RF4439d-25A RRUs(3)** **(3) Samsung RF4461d-13A RRUs(3)** **(1) CommScope FE-16148-OVP-B12 TMA** **(3) SitePro VFA12-HD Sector Frame Mounts** **(3) Tiebacks**	**(2) 6x12 Hybrid**	**Verizon Final**
77.0	77.0	(1) L6" x 6" x 7/16" Ring Mount	—	Existing
76.7(4)	78.7	(3) Ericsson RRUS 32 B2 (1) Raycap DC6-48-60-18-8F SSD	(6) 7/8" TX (3) 0.92" OD DC (4) 3/4" OD DC (1) 3/8" Fiber (1) 1/2" Fiber	AT&T Final
	77.2	(3) Ericsson RRUS 32 B30(3) (3) Ericsson RRUS 32 B66A(3) (1) Raycap DC6-48-60-18-8F SSD		
	76.7	(3) CCITPA65R-BU6DA-K Panels (3) Ericsson AIR6449 B77D Panels (3) Ericsson AIR6419 B77G Panels (3) CCIDMP65R-BU6DA Panels (3) Ericsson RRUS 4478 B14 (3) Ericsson RRUS 4449 B5/B12 (1) Raycap DC9-48-60-24-8C-EV SSDs (3) 12' Sector Frame Mounts		
75.0	75.0	(1) L6" x 6" x 7/16" Ring Mount	—	Existing
73.0	73.0	(1) 2-3/8" x 8' Pipe Mount		
67.7	67.7	(1) L6" x 6" x 7/16" Ring Mount		

1) Elevations reference centerline of panel, yagi, mounts, and dish antennas, and base of whip antennas, in relation to the base of the tower.
2) Refer to the feed line diagram and analysis output in Appendix A for the location and orientation of feedlines and equipment.
3) Secondary appurtenances such as TMAs, Diplexers, and RRUs are considered to be installed directly behind panel antennas for frontal area shielding. See analysis output for magnitude of individual shielding.
4) Elevations adjusted from Structural Components Mapping dated 03/15/2022, Job # 220142.

2 RESULTS

The analysis was performed using tnxTower v8.1.1.0, a structural analysis program developed by Tower Numerics, Inc. specifically for the communication tower industry.

2.1 TOWER MEMBER STRESS LEVELS

The tower has the following stress ratios in its structural members.

Elev. (ft)	Member	Stress Ratio*
0 – 90.4	Legs	0.77
0 – 90.4	Bracing	0.63
0 – 90.4	Connections	0.63

Stress ratio (SR) criteria:
SR $\leq$ 1.00 is completely within code limits.
SR $\leq$ 1.05 is considered within acceptable tolerance of code limits.
SR > 1.05 is outside acceptable tolerance of code limits and requires structural modifications.
* Seismic analysis for similar structures under similar loading conditions has been shown to produce significantly lower stress ratios than wind and ice. Therefore, seismic analysis has not been included in the current analysis.

2.2 FOUNDATION REACTIONS

The reactions listed below are for the design wind speed listed. Reactions are factored loads.

Reaction Type	Current Wind Reactions	Current Iced Reactions	Foundation Status
Moment (ft-kips)	1,237.5	310.2	Passes*
Shear (kips)	22.4	5.5	
Axial (kips)	21.8	43.7	
Leg Compression (kips)	72.4	--	
Leg Uplift (kips)	62.8	--	
Leg Shear (kips)	10.8	--	

* See Appendix A for foundation calculations.

2.3 TOWER DEFLECTION

The tower deflections have been reviewed and are believed to be acceptable for the proposed equipment. The carrier(s) should review the deflections for the service wind condition included in Appendix A for compatibility with their equipment.

3 PROVIDED INFORMATION AND ASSUMPTIONS

The following information was directly used to generate this report, and can be found in Appendix B.

Document	Author	Date	Reference
Collocation Application	Verizon	11/21/2023	CT-1680
RFDS	Verizon	09/27/2023	Portland HS CT
Mount Analysis	Centek Engineering	11/09/2023	22017.06 REV1
Construction Drawings	Centek Engineering	02/12/2024	22017.06
Structural Analysis Report – Verizon	Structural Components, LLC	01/23/2024	240022
Post Modification Inspection Report	Structural Components, LLC	09/19/2023	230193

The following assumptions were made in order to complete the analysis. These assumptions must be checked. If they do not accurately represent the existing or proposed tower, foundation, soil, and loading conditions, we must be notified so that we can make the appropriate changes to our analysis, conclusions, and recommendations.

1. The tower and foundation are in good condition with no corrosion, damage or fatiguing issues which could reduce the carrying capacity of the tower.
2. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
3. All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.
4. The following assumptions regarding member minimum material or type apply to this structure, unless otherwise noted in analysis:
   - Angle Legs: A36
   - Angle Bracing: A36
   - Splice Bolts: A307
   - Gusset Plates: A36
   - Brace Bolts: A325N
5. The feedline and appurtenance configuration is as stated in the report. All antennas, coax, cables and waveguide cables are assumed to be properly installed and supported as per manufacturer requirement.
6. The support mounts and/or platforms are not analyzed and are considered adequate to support the loading.
7. All mounting systems connect at tower bracing points. Local stresses are not considered unless noted otherwise in analysis.
8. Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
9. The soil parameters are as per data supplied, or as assumed, and stated in the calculations.

4 CONCLUSIONS

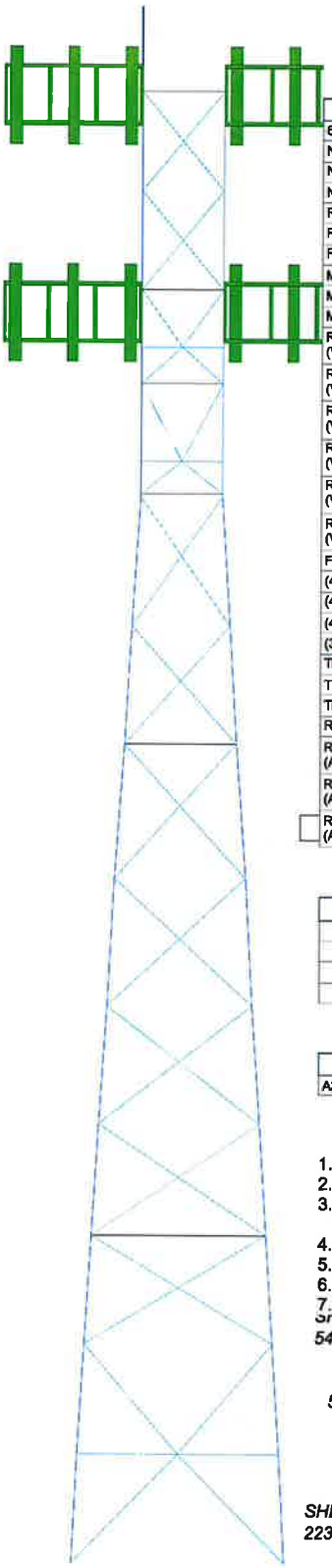
To the best of our knowledge and belief the tower and foundations satisfy the requirements of the applicable codes and standards having jurisdiction over the work for the loadings and conditions as outlined in this report. **Structural modifications are not required at this time.**

APPENDIX A

Tower Profile and Calculations

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L5x5x5/16				L5x5x3/8			L4x4x3/8					L4x4x1/4
Leg Grade							A36							
Diagonals		L3x3x5/16	C			L2x2 1/2x3/16				B	L2 1/2x2 1/2x3/16	A		L2x2x1/4
Diagonal Grade							A36							
Top Girts		N.A.		L2x2 1/2x1/4		N.A.	L2 1/2x2 1/2x3/16	N.A.		E	2L4x4x3/8	N.A.	D	L2 1/2x2 1/2x3/16
Bottom Girts						N.A.				D	N.A.	D	N.A.	
Horizontals	F					N.A.								
Red. Horizontals		L1 3/4x1 3/4x3/16					N.A.							
Red. Diagonals		L1 3/4x1 3/4x3/16					N.A.							
Inner Bracing		N.A.		L2x2x3/16		N.A.	L2 1/2x2x3/16	N.A.		G	N.A.	G	N.A.	
Face Width (ft)	13.083	12.2597	11.4383	10.6142	9.7793	8.883	7.9252	6.9059	6.0147					5.0416
# Panels @ (ft)		2 @ 6.7075		1 @ 6.886	1 @ 8.792	1 @ 7.292	1 @ 7.792	1 @ 8.292	1 @ 7.25	1 @ 7.917	1 @ 4.75	H	1 @ 3.5	2 @ 6.06292
Weight (lb)	9055.0	879.7	883.8	819.8	805.0	820.6	826.9	792.8	497.4	822.3	753.1	359.2	443.4	798.4

90.3 ft
78.1 ft
74.6 ft
72.3 ft
67.6 ft
65.4 ft
57.5 ft
50.3 ft
42.0 ft
34.2 ft
26.9 ft
20.1 ft
13.4 ft
6.7 ft
0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' x 5/8" Lighting Rod	90.5	RRUS-32 (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
RT4423 w/ RRU (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
RT4423 w/ RRU (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
RT4423 w/ RRU (Verizon)	90	DC6-48-60-18-8F (ATI)	76.7
MT6413-77A (Verizon)	90	DC6-48-60-18-8F (ATI)	76.7
MT6413-77A (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
MT6413-77A (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
RF4439d-25A (Full Frontal Shielding) (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
RF4439d-25A (Full Frontal Shielding) (Verizon)	90	AIR6449 B77D (ATI)	76.7
RF4439d-25A (Full Frontal Shielding) (Verizon)	90	AIR6449 B77D (ATI)	76.7
RF4416d-13A (Full Frontal Shielding) (Verizon)	90	AIR6449 B77D (ATI)	76.7
RF4416d-13A (Full Frontal Shielding) (Verizon)	90	AIR6419 B77G (ATI)	76.7
RF4416d-13A (Full Frontal Shielding) (Verizon)	90	AIR6419 B77G (ATI)	76.7
FE-16148-OVP-B12 (Verizon)	90	AIR6419 B77G (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
(3) SitePro VFA12-HD (Verizon)	90	4478 RRU (ATI)	76.7
Tieback (Verizon)	90	4478 RRU (ATI)	76.7
Tieback (Verizon)	90	4478 RRU (ATI)	76.7
Tieback (Verizon)	90	4449 RRU (ATI)	76.7
Ring Mount	77	4449 RRU (ATI)	76.7
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	4449 RRU (ATI)	76.7
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	DC9-48-60-24-8C-EV (ATI)	76.7
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	(3) 12' Sector Frames (ATI)	76.7
		Ring Mount	75
		2-3/8" x 8' Pipe Mount	73
		Ring Mount	67.7

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

DOWN: 72322 lb
SHEAR: 12578 lb

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 77%

SHEAR 5462 lb — MOMENT 310138 lb-ft

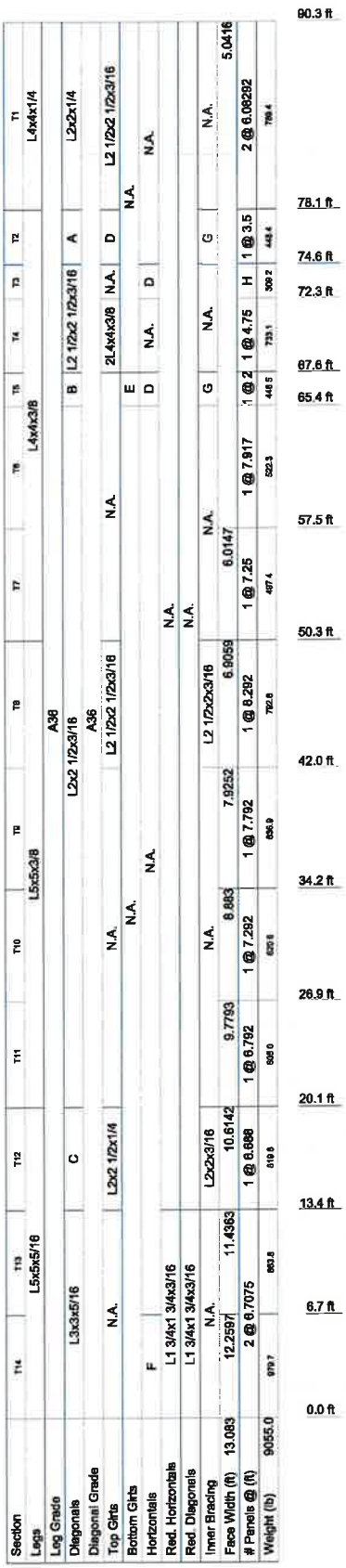
TORQUE 2040 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL 21764 lb
SHEAR 22342 lb — MOMENT 1237444 lb-ft

TORQUE 7153 lb-ft
REACTIONS - 120 mph WIND

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: *240022 REV 1*			
Project: *Portland (CT-1680)*			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 02/13/24		Scale: NTS
Path:			Dwg No. E-1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

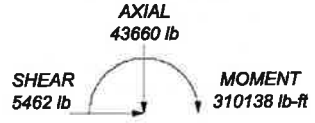
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 77%

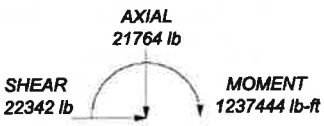
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 72322 lb
SHEAR: 12578 lb

UPLIFT: -62788 lb
SHEAR: 10870 lb



TORQUE 2040 lb-ft
50 mph WIND - 1.0000 in ICE



TORQUE 7153 lb-ft
REACTIONS - 120 mph WIND

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: 240022 REV 1			
Project: Portland (CT-1680)			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 02/13/24		Scale: NTS
Path:			Dwg No. E-1

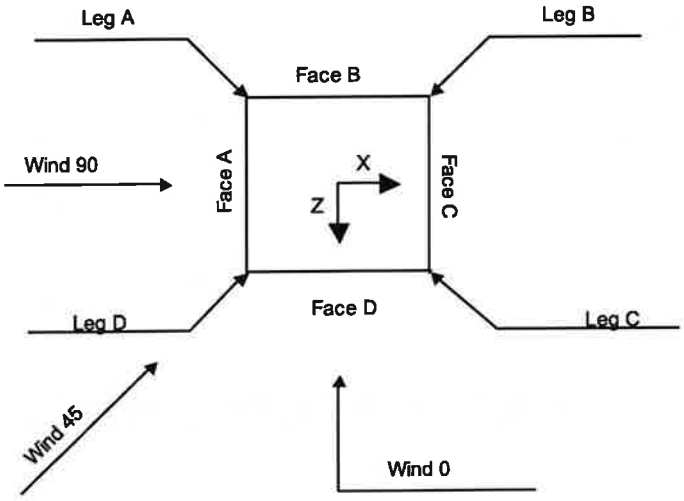
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 90.33 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.04 ft at the top and 13.08 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 345.00 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °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-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	90.33-78.06			5.04	1	12.27
T2	78.06-74.56			5.04	1	3.50
T3	74.56-72.31			5.04	1	2.25
T4	72.31-67.56			5.04	1	4.75
T5	67.56-65.44			5.04	1	2.13
T6	65.44-57.52			5.04	1	7.92
T7	57.52-50.27			6.01	1	7.25
T8	50.27-41.98			6.91	1	8.29
T9	41.98-34.19			7.93	1	7.79
T10	34.19-26.90			8.88	1	7.29
T11	26.90-20.10			9.78	1	6.79
T12	20.10-13.42			10.61	1	6.69
T13	13.42-6.71			11.44	1	6.71
T14	6.71-0.00			12.26	1	6.71

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	90.33-78.06	6.08	X Brace	No	Yes	1.2500	0.0000
T2	78.06-74.56	3.50	K Brace Up	No	Yes	0.0000	0.0000
T3	74.56-72.31	2.25	K Brace Down	No	Yes	0.0000	0.0000
T4	72.31-67.56	4.75	K Brace Up	No	Yes	0.0000	0.0000
T5	67.56-65.44	2.00	K Brace Down	No	Yes	0.0000	1.5000

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	65.44-57.52	7.92	X Brace	No	No	0.0000	0.0000
T7	57.52-50.27	7.25	X Brace	No	No	0.0000	0.0000
T8	50.27-41.98	8.29	X Brace	No	No	0.0000	0.0000
T9	41.98-34.19	7.79	X Brace	No	No	0.0000	0.0000
T10	34.19-26.90	7.29	X Brace	No	No	0.0000	0.0000
T11	26.90-20.10	6.79	X Brace	No	No	0.0000	0.0000
T12	20.10-13.42	6.69	X Brace	No	No	0.0000	0.0000
T13	13.42-6.71	6.71	K1 Up	No	Yes	0.0000	0.0000
T14	6.71-0.00	6.71	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 90.33-78.06	Equal Angle	L4x4x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 78.06-74.56	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T3 74.56-72.31	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 72.31-67.56	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 67.56-65.44	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 65.44-57.52	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T7 57.52-50.27	Equal Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T8 50.27-41.98	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T9 41.98-34.19	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T10 34.19-26.90	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T11 26.90-20.10	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T12 20.10-13.42	Equal Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 13.42-6.71	Equal Angle	L5x5x5/16	A36 (36 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T14 6.71-0.00	Equal Angle	L5x5x5/16	A36 (36 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 90.33-78.06	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 78.06-74.56	Single Angle	L4x3 1/2x1/4	A36	Solid Round		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
			(36 ksi)			(36 ksi)
T4 72.31-67.56	Double Equal Angle	2L4x4x3/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 67.56-65.44	Single Angle		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 50.27-41.98	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T12 20.10-13.42	Single Angle	L2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 78.06-74.56	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T3 74.56-72.31	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T4 72.31-67.56	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T5 67.56-65.44	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T13 13.42-6.71	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T14 6.71-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 78.06-74.56	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T3 74.56-72.31	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 67.56-65.44	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 65.44-57.52	Solid Round		A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 50.27-41.98	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T12 20.10-13.42	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T13	A36	Horizontal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
13.42-6.71	(36 ksi)	Diagonal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
T14 6.71-0.00	A36	Horizontal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1
	(36 ksi)	Diagonal (1)	Equal Angle	L1 3/4x1 3/4x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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 90.33-78.06	0.00	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 78.06-74.56	0.35	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 74.56-72.31	0.35	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 72.31-67.56	0.58	0.2500	A36 (36 ksi)	1	1	1	36.0000	Third-Pt	36.0000
T5 67.56-65.44	0.58	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 65.44-57.52	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 57.52-50.27	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 50.27-41.98	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 41.98-34.19	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 34.19-26.90	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 26.90-20.10	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 20.10-13.42	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 13.42-6.71	0.43	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T14 6.71-0.00	0.43	0.2500	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	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 Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
90.33-78.06				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
78.06-74.56				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
74.56-72.31				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
72.31-67.56				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
67.56-65.44				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
65.44-57.52				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
57.52-50.27				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
50.27-41.98				1	1	1	1	1	1	1
T9	No	No	1	1	1	1	1	1	1	1
41.98-34.19				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
34.19-26.90				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	1	1
26.90-20.10				1	1	1	1	1	1	1
T12	No	No	1	1	1	1	1	1	1	1
20.10-13.42				1	1	1	1	1	1	1
T13	No	No	1	1	1	1	1	1	1	1
13.42-6.71				1	1	1	1	1	1	1
T14 6.71-0.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 90.33-78.06	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 78.06-74.56	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 74.56-72.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 72.31-67.56	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 67.56-65.44	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 65.44-57.52	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 57.52-50.27	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.27-41.98	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 41.98-34.19	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 34.19-26.90	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 26.90-20.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.10-13.42	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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
T13 13.42-6.71	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 6.71-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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
T1 90.33-78.06	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 78.06-74.56	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 74.56-72.31	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 72.31-67.56	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 67.56-65.44	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 65.44-57.52	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 57.52-50.27	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.27-41.98	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 41.98-34.19	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 34.19-26.90	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 26.90-20.10	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.10-13.42	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 13.42-6.71	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 6.71-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 90.33-78.06	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 78.06-74.56	4.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 74.56-72.31	0.0000	0.0000	3.2500	0.0000	0.0000	0.0000	0.0000	0.0000
T4 72.31-67.56	4.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 67.56-65.44	0.0000	0.0000	3.2500	0.0000	0.0000	0.0000	0.0000	0.0000
T6 65.44-57.52	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T7 57.52-50.27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T8 50.27-41.98	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T9 41.98-34.19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T10 34.19-26.90	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T11 26.90-20.10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T12 20.10-13.42	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T13 13.42-6.71	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T14 6.71-0.00	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 90.33-78.06	Sleeve DS	0.6250 A307	12	0.6240 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 78.06-74.56	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T3 74.56-72.31	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T4 72.31-67.56	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T5 67.56-65.44	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T6 65.44-57.52	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	3	0.6250 A325N	0
T7 57.52-50.27	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 50.27-41.98	Sleeve DS	0.6250 A307	12	0.5410 A325N	2	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 41.98-34.19	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 34.19-26.90	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 26.90-20.10	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 20.10-13.42	Sleeve DS	0.6250 A307	12	0.5410 A325N	2	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 13.42-6.71	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T14 6.71-0.00	Flange	0.7500 A307	0	0.5410 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 90.33-78.06	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 78.06-74.56	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 74.56-72.31	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 72.31-67.56	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 67.56-65.44	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 65.44-57.52	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 57.52-50.27	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 50.27-41.98	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 41.98-34.19	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 34.19-26.90	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 26.90-20.10	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 20.10-13.42	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 13.42-6.71	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 6.71-0.00	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Leg A AZ 0 Deg													
Feedline Ladder (Af)	C	No	No	Af (CaAa)	77.00 - 0.00	0.0000	0	2	2	24.0000	2.0000		4.20
LDF5-50A (7/8 FOAM) (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.01	6	6	1.0900	1.0900		0.33
0.92" DC (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	-0.07	3	3	0.9200	0.9200		0.42
3/8" Fiber (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.07	1	1	0.3750	0.3750		0.10
1/2" Fiber (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.075	1	1	0.5000	0.5000		0.10
3/4" OD (AT&T)	C	No	No	Ar (CaAa)	76.70 - 0.00	0.0000	0.12	4	2	0.7500	0.7500		0.40
1" Conduit (dead)	C	No	No	Ar (CaAa)	48.00 - 0.00	0.0000	0.25	1	1	1.0000	1.0000		0.75
5/16" OD (dead)	D	No	No	Ar (CaAa)	48.00 - 50.00	-4.0000	0.25	1	1	0.3125	0.3125		2.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1-5/16" OD (dead)	D	No	No	Ar (CaAa)	54.00 - 0.00	0.0000	0.5	1	1	1.3125	1.3125		1.00
Safety Line 3/8 *****	C	No	No	Ar (CaAa)	90.33 - 0.00	0.0000	0.5	1	1	0.3750	0.3750		0.22
6x12 HCS (Verizon)	D	No	No	Ar (CaAa)	90.00 - 0.00	0.0000	-0.4	2	2	1.5400	1.5400		1.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
T1	90.33-78.06	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.460	0.000	2.70
		D	0.000	0.000	3.677	0.000	40.59
T2	78.06-74.56	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.571	0.000	31.98
		D	0.000	0.000	1.078	0.000	11.90
T3	74.56-72.31	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.549	0.000	30.70
		D	0.000	0.000	0.693	0.000	7.65
T4	72.31-67.56	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.603	0.000	64.82
		D	0.000	0.000	1.463	0.000	16.15
T5	67.56-65.44	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.296	0.000	29.00
		D	0.000	0.000	0.654	0.000	7.22
T6	65.44-57.52	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.006	0.000	108.03
		D	0.000	0.000	2.438	0.000	26.92
T7	57.52-50.27	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.657	0.000	98.93
		D	0.000	0.000	2.722	0.000	28.38
T8	50.27-41.98	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	17.366	0.000	117.67
		D	0.000	0.000	3.705	0.000	40.48
T9	41.98-34.19	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.532	0.000	112.17
		D	0.000	0.000	3.423	0.000	34.28
T10	34.19-26.90	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	15.471	0.000	104.97
		D	0.000	0.000	3.203	0.000	32.08
T11	26.90-20.10	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.410	0.000	97.78

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		D	0.000	0.000	2.983	0.000	29.88
T12	20.10-13.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.190	0.000	96.28
		D	0.000	0.000	2.938	0.000	29.43
T13	13.42-6.71	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.231	0.000	96.56
		D	0.000	0.000	2.946	0.000	29.51
T14	6.71-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	14.231	0.000	96.56
		D	0.000	0.000	2.946	0.000	29.51

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	90.33-78.06	A	1.098	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	3.155	0.000	26.95
		D		0.000	0.000	11.599	0.000	127.61
T2	78.06-74.56	A	1.087	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	12.238	0.000	124.42
		D		0.000	0.000	3.388	0.000	37.16
T3	74.56-72.31	A	1.083	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	12.153	0.000	122.52
		D		0.000	0.000	2.175	0.000	23.82
T4	72.31-67.56	A	1.078	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	25.606	0.000	257.55
		D		0.000	0.000	4.583	0.000	50.12
T5	67.56-65.44	A	1.073	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	11.432	0.000	114.71
		D		0.000	0.000	2.046	0.000	22.34
T6	65.44-57.52	A	1.064	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.461	0.000	424.44
		D		0.000	0.000	7.601	0.000	82.78
T7	57.52-50.27	A	1.050	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	38.684	0.000	384.26
		D		0.000	0.000	8.199	0.000	90.14
T8	50.27-41.98	A	1.034	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	45.824	0.000	453.63
		D		0.000	0.000	11.032	0.000	125.26
T9	41.98-34.19	A	1.014	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	43.382	0.000	426.20
		D		0.000	0.000	9.954	0.000	109.09
T10	34.19-26.90	A	0.992	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	40.246	0.000	391.36

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
		D		0.000	0.000	9.228	0.000	100.35
T11	26.90-20.10	A	0.967	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	37.106	0.000	356.54
		D		0.000	0.000	8.501	0.000	91.61
T12	20.10-13.42	A	0.934	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	36.070	0.000	341.38
		D		0.000	0.000	8.256	0.000	87.94
T13	13.42-6.71	A	0.888	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.496	0.000	328.58
		D		0.000	0.000	8.112	0.000	84.98
T14	6.71-0.00	A	0.796	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	34.148	0.000	302.15
		D		0.000	0.000	7.780	0.000	78.78

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	90.33-78.06	1.4277	1.2043	3.6056	2.9720
T2	78.06-74.56	2.7626	0.9732	5.9068	1.8610
T3	74.56-72.31	3.1920	0.8580	4.9996	1.2167
T4	72.31-67.56	3.7135	0.9794	7.9591	1.8220
T5	67.56-65.44	2.3399	0.6493	1.9241	0.5003
T6	65.44-57.52	4.9646	1.2717	10.6230	2.3454
T7	57.52-50.27	5.0162	1.7458	10.8198	3.1358
T8	50.27-41.98	4.6827	2.1503	10.5243	4.0324
T9	41.98-34.19	5.6369	2.5305	12.3747	4.5809
T10	34.19-26.90	5.9797	2.6998	13.0637	4.8597
T11	26.90-20.10	6.2439	2.8346	13.5615	5.0672
T12	20.10-13.42	5.5037	2.5544	12.3642	4.7105
T13	13.42-6.71	5.8564	2.7208	12.9968	4.9381
T14	6.71-0.00	5.5916	2.6253	12.0543	4.6085

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	14	Safety Line 3/8	78.06 - 90.33	0.6000	0.6000
T1	16	6x12 HCS	78.06 - 90.00	0.6000	0.6000
T2	2	Feedline Ladder (Af)	74.56 - 77.00	0.6000	0.5038
T2	5	LDF5-50A (7/8 FOAM)	74.56 - 76.70	0.6000	0.5038
T2	6	0.92" DC	74.56 - 76.70	0.6000	0.5038
T2	7	3/8" Fiber	74.56 - 76.70	0.6000	0.5038
T2	8	1/2" Fiber	74.56 - 76.70	0.6000	0.5038
T2	10	3/4" OD	74.56 - 76.70	0.6000	0.5038
T2	14	Safety Line 3/8	74.56 - 78.06	0.6000	0.5038

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	16	6x12 HCS	74.56 - 78.06	0.6000	0.5038
T3	2	Feedline Ladder (Af)	72.31 - 74.56	0.5973	0.3629
T3	5	LDF5-50A (7/8 FOAM)	72.31 - 74.56	0.5973	0.3629
T3	6	0.92" DC	72.31 - 74.56	0.5973	0.3629
T3	7	3/8" Fiber	72.31 - 74.56	0.5973	0.3629
T3	8	1/2" Fiber	72.31 - 74.56	0.5973	0.3629
T3	10	3/4" OD	72.31 - 74.56	0.5973	0.3629
T3	14	Safety Line 3/8	72.31 - 74.56	0.5973	0.3629
T3	16	6x12 HCS	72.31 - 74.56	0.5973	0.3629
T4	2	Feedline Ladder (Af)	67.56 - 72.31	0.6000	0.5315
T4	5	LDF5-50A (7/8 FOAM)	67.56 - 72.31	0.6000	0.5315
T4	6	0.92" DC	67.56 - 72.31	0.6000	0.5315
T4	7	3/8" Fiber	67.56 - 72.31	0.6000	0.5315
T4	8	1/2" Fiber	67.56 - 72.31	0.6000	0.5315
T4	10	3/4" OD	67.56 - 72.31	0.6000	0.5315
T4	14	Safety Line 3/8	67.56 - 72.31	0.6000	0.5315
T4	16	6x12 HCS	67.56 - 72.31	0.6000	0.5315
T5	2	Feedline Ladder (Af)	65.44 - 67.56	0.4832	0.1706
T5	5	LDF5-50A (7/8 FOAM)	65.44 - 67.56	0.4832	0.1706
T5	6	0.92" DC	65.44 - 67.56	0.4832	0.1706
T5	7	3/8" Fiber	65.44 - 67.56	0.4832	0.1706
T5	8	1/2" Fiber	65.44 - 67.56	0.4832	0.1706
T5	10	3/4" OD	65.44 - 67.56	0.4832	0.1706
T5	14	Safety Line 3/8	65.44 - 67.56	0.4832	0.1706
T5	16	6x12 HCS	65.44 - 67.56	0.4832	0.1706
T6	2	Feedline Ladder (Af)	57.52 - 65.44	0.6000	0.6000
T6	5	LDF5-50A (7/8 FOAM)	57.52 - 65.44	0.6000	0.6000
T6	6	0.92" DC	57.52 - 65.44	0.6000	0.6000
T6	7	3/8" Fiber	57.52 - 65.44	0.6000	0.6000
T6	8	1/2" Fiber	57.52 - 65.44	0.6000	0.6000
T6	10	3/4" OD	57.52 - 65.44	0.6000	0.6000
T6	14	Safety Line 3/8	57.52 - 65.44	0.6000	0.6000
T6	16	6x12 HCS	57.52 - 65.44	0.6000	0.6000
T7	2	Feedline Ladder (Af)	50.27 - 57.52	0.6000	0.6000
T7	5	LDF5-50A (7/8 FOAM)	50.27 - 57.52	0.6000	0.6000
T7	6	0.92" DC	50.27 - 57.52	0.6000	0.6000
T7	7	3/8" Fiber	50.27 - 57.52	0.6000	0.6000
T7	8	1/2" Fiber	50.27 - 57.52	0.6000	0.6000
T7	10	3/4" OD	50.27 - 57.52	0.6000	0.6000
T7	13	1-5/16" OD	50.27 - 54.00	0.6000	0.6000
T7	14	Safety Line 3/8	50.27 - 57.52	0.6000	0.6000
T7	16	6x12 HCS	50.27 - 57.52	0.6000	0.6000
T8	2	Feedline Ladder (Af)	41.98 - 50.27	0.6000	0.6000
T8	5	LDF5-50A (7/8 FOAM)	41.98 - 50.27	0.6000	0.6000
T8	6	0.92" DC	41.98 - 50.27	0.6000	0.6000
T8	7	3/8" Fiber	41.98 - 50.27	0.6000	0.6000
T8	8	1/2" Fiber	41.98 - 50.27	0.6000	0.6000
T8	10	3/4" OD	41.98 - 50.27	0.6000	0.6000
T8	11	1" Conduit	41.98 - 48.00	0.6000	0.6000
T8	12	5/16" OD	48.00 - 50.00	0.6000	0.6000
T8	13	1-5/16" OD	41.98 - 50.27	0.6000	0.6000
T8	14	Safety Line 3/8	41.98 - 50.27	0.6000	0.6000
T8	16	6x12 HCS	41.98 - 50.27	0.6000	0.6000
T9	2	Feedline Ladder (Af)	34.19 - 41.98	0.6000	0.6000
T9	5	LDF5-50A (7/8 FOAM)	34.19 - 41.98	0.6000	0.6000
T9	6	0.92" DC	34.19 - 41.98	0.6000	0.6000
T9	7	3/8" Fiber	34.19 - 41.98	0.6000	0.6000
T9	8	1/2" Fiber	34.19 - 41.98	0.6000	0.6000
T9	10	3/4" OD	34.19 - 41.98	0.6000	0.6000
T9	11	1" Conduit	34.19 - 41.98	0.6000	0.6000
T9	13	1-5/16" OD	34.19 - 41.98	0.6000	0.6000
T9	14	Safety Line 3/8	34.19 - 41.98	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	16	6x12 HCS	34.19 - 41.98	0.6000	0.6000
T10	2	Feedline Ladder (Af)	26.90 - 34.19	0.6000	0.6000
T10	5	LDF5-50A (7/8 FOAM)	26.90 - 34.19	0.6000	0.6000
T10	6	0.92" DC	26.90 - 34.19	0.6000	0.6000
T10	7	3/8" Fiber	26.90 - 34.19	0.6000	0.6000
T10	8	1/2" Fiber	26.90 - 34.19	0.6000	0.6000
T10	10	3/4" OD	26.90 - 34.19	0.6000	0.6000
T10	11	1" Conduit	26.90 - 34.19	0.6000	0.6000
T10	13	1-5/16" OD	26.90 - 34.19	0.6000	0.6000
T10	14	Safety Line 3/8	26.90 - 34.19	0.6000	0.6000
T10	16	6x12 HCS	26.90 - 34.19	0.6000	0.6000
T11	2	Feedline Ladder (Af)	20.10 - 26.90	0.6000	0.6000
T11	5	LDF5-50A (7/8 FOAM)	20.10 - 26.90	0.6000	0.6000
T11	6	0.92" DC	20.10 - 26.90	0.6000	0.6000
T11	7	3/8" Fiber	20.10 - 26.90	0.6000	0.6000
T11	8	1/2" Fiber	20.10 - 26.90	0.6000	0.6000
T11	10	3/4" OD	20.10 - 26.90	0.6000	0.6000
T11	11	1" Conduit	20.10 - 26.90	0.6000	0.6000
T11	13	1-5/16" OD	20.10 - 26.90	0.6000	0.6000
T11	14	Safety Line 3/8	20.10 - 26.90	0.6000	0.6000
T11	16	6x12 HCS	20.10 - 26.90	0.6000	0.6000
T12	2	Feedline Ladder (Af)	13.42 - 20.10	0.6000	0.6000
T12	5	LDF5-50A (7/8 FOAM)	13.42 - 20.10	0.6000	0.6000
T12	6	0.92" DC	13.42 - 20.10	0.6000	0.6000
T12	7	3/8" Fiber	13.42 - 20.10	0.6000	0.6000
T12	8	1/2" Fiber	13.42 - 20.10	0.6000	0.6000
T12	10	3/4" OD	13.42 - 20.10	0.6000	0.6000
T12	11	1" Conduit	13.42 - 20.10	0.6000	0.6000
T12	13	1-5/16" OD	13.42 - 20.10	0.6000	0.6000
T12	14	Safety Line 3/8	13.42 - 20.10	0.6000	0.6000
T12	16	6x12 HCS	13.42 - 20.10	0.6000	0.6000
T13	2	Feedline Ladder (Af)	6.71 - 13.42	0.6000	0.6000
T13	5	LDF5-50A (7/8 FOAM)	6.71 - 13.42	0.6000	0.6000
T13	6	0.92" DC	6.71 - 13.42	0.6000	0.6000
T13	7	3/8" Fiber	6.71 - 13.42	0.6000	0.6000
T13	8	1/2" Fiber	6.71 - 13.42	0.6000	0.6000
T13	10	3/4" OD	6.71 - 13.42	0.6000	0.6000
T13	11	1" Conduit	6.71 - 13.42	0.6000	0.6000
T13	13	1-5/16" OD	6.71 - 13.42	0.6000	0.6000
T13	14	Safety Line 3/8	6.71 - 13.42	0.6000	0.6000
T13	16	6x12 HCS	6.71 - 13.42	0.6000	0.6000
T14	2	Feedline Ladder (Af)	0.00 - 6.71	0.6000	0.6000
T14	5	LDF5-50A (7/8 FOAM)	0.00 - 6.71	0.6000	0.6000
T14	6	0.92" DC	0.00 - 6.71	0.6000	0.6000
T14	7	3/8" Fiber	0.00 - 6.71	0.6000	0.6000
T14	8	1/2" Fiber	0.00 - 6.71	0.6000	0.6000
T14	10	3/4" OD	0.00 - 6.71	0.6000	0.6000
T14	11	1" Conduit	0.00 - 6.71	0.6000	0.6000
T14	13	1-5/16" OD	0.00 - 6.71	0.6000	0.6000
T14	14	Safety Line 3/8	0.00 - 6.71	0.6000	0.6000
T14	16	6x12 HCS	0.00 - 6.71	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
6' x 5/8" Lighting Rod	A	From Leg	0.00		0.0000	90.50	No Ice	0.38	0.38	10.00
			0.00				1/2" Ice	0.99	0.99	14.19
			3.00				1" Ice	1.62	1.62	22.26
***										
NNH4-65B-R6	A	From Leg	3.00		30.0000	90.00	No Ice	12.27	5.75	83.00
(Verizon)			0.00				1/2" Ice	12.77	6.21	155.14
			0.00				1" Ice	13.27	6.67	233.92
NNH4-65B-R6	B	From Leg	3.00		60.0000	90.00	No Ice	12.27	5.75	83.00
(Verizon)			0.00				1/2" Ice	12.77	6.21	155.14
			0.00				1" Ice	13.27	6.67	233.92
NNH4-65B-R6	D	From Leg	3.00		0.0000	90.00	No Ice	12.27	5.75	83.00
(Verizon)			0.00				1/2" Ice	12.77	6.21	155.14
			0.00				1" Ice	13.27	6.67	233.92
RT4423 w/ RRU	A	From Leg	3.00		30.0000	90.00	No Ice	0.87	0.43	18.70
(Verizon)			-5.00				1/2" Ice	0.99	0.52	25.74
			0.00				1" Ice	1.11	0.61	34.59
RT4423 w/ RRU	B	From Leg	3.00		60.0000	90.00	No Ice	0.87	0.43	18.70
(Verizon)			-5.00				1/2" Ice	0.99	0.52	25.74
			0.00				1" Ice	1.11	0.61	34.59
RT4423 w/ RRU	D	From Leg	3.00		0.0000	90.00	No Ice	0.87	0.43	18.70
(Verizon)			-5.00				1/2" Ice	0.99	0.52	25.74
			0.00				1" Ice	1.11	0.61	34.59
MT6413-77A	A	From Leg	3.00		30.0000	90.00	No Ice	3.78	1.46	57.30
(Verizon)			5.00				1/2" Ice	4.03	1.65	81.61
			0.00				1" Ice	4.29	1.84	109.36
MT6413-77A	B	From Leg	3.00		60.0000	90.00	No Ice	3.78	1.46	57.30
(Verizon)			5.00				1/2" Ice	4.03	1.65	81.61
			0.00				1" Ice	4.29	1.84	109.36
MT6413-77A	D	From Leg	3.00		0.0000	90.00	No Ice	3.78	1.46	57.30
(Verizon)			5.00				1/2" Ice	4.03	1.65	81.61
			0.00				1" Ice	4.29	1.84	109.36
RF4439d-25A (Full Frontal	A	From Leg	2.50		30.0000	90.00	No Ice	0.00	1.25	74.70
Shielding)			0.00				1/2" Ice	0.00	1.39	93.02
(Verizon)			0.00				1" Ice	0.00	1.54	114.12
RF4439d-25A (Full Frontal	B	From Leg	2.50		60.0000	90.00	No Ice	0.00	1.25	74.70
Shielding			0.00				1/2" Ice	0.00	1.39	93.02
(Verizon)			0.00				1" Ice	0.00	1.54	114.12
RF4439d-25A (Full Frontal	D	From Leg	2.50		0.0000	90.00	No Ice	0.00	1.25	74.70
Shielding)			0.00				1/2" Ice	0.00	1.39	93.02
(Verizon)			0.00				1" Ice	0.00	1.54	114.12
RF4416d-13A (Full Frontal	A	From Leg	2.50		30.0000	90.00	No Ice	0.00	1.28	79.10
Shielding)			0.00				1/2" Ice	0.00	1.42	97.61
(Verizon)			0.00				1" Ice	0.00	1.57	118.91
RF4416d-13A (Full Frontal	B	From Leg	2.50		60.0000	90.00	No Ice	0.00	1.28	79.10
Shielding)			0.00				1/2" Ice	0.00	1.42	97.61
(Verizon)			0.00				1" Ice	0.00	1.57	118.91
RF4416d-13A (Full Frontal	D	From Leg	2.50		0.0000	90.00	No Ice	0.00	1.28	79.10
Shielding)			0.00				1/2" Ice	0.00	1.42	97.61
(Verizon)			0.00				1" Ice	0.00	1.57	118.91
FE-16148-OVP-B12	A	From Leg	1.00		30.0000	90.00	No Ice	1.87	1.07	15.21
(Verizon)			0.00				1/2" Ice	2.04	1.20	31.51
			0.00				1" Ice	2.21	1.35	50.47
(4) 2-3/8" x 8' Pipe Mount	A	From Leg	3.00		30.0000	90.00	No Ice	1.90	1.90	30.00
(Verizon)			0.00				1/2" Ice	2.73	2.73	44.37
			0.00				1" Ice	3.40	3.40	64.01
(4) 2-3/8" x 8' Pipe Mount	B	From Leg	3.00		60.0000	90.00	No Ice	1.90	1.90	30.00
(Verizon)			0.00				1/2" Ice	2.73	2.73	44.37

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.40	3.40	64.01
(4) 2-3/8" x 8' Pipe Mount (Verizon)	D	From Leg	3.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	30.00 44.37 64.01
(3) SitePro VFA12-HD (Verizon)	C	None		0.0000	90.00	No Ice 1/2" Ice 1" Ice	25.00 37.00 47.00	25.00 37.00 47.00	800.00 1100.00 1500.00
Tieback (Verizon)	A	From Leg	1.50 0.00 0.00	30.0000	90.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.33 2.13 2.93	25.00 45.00 65.00
Tieback (Verizon)	B	From Leg	1.50 0.00 0.00	60.0000	90.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.33 2.13 2.93	25.00 45.00 65.00
Tieback (Verizon)	D	From Leg	1.50 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.33 2.13 2.93	25.00 45.00 65.00
***									
Ring Mount	C	None		0.0000	77.00	No Ice 1/2" Ice 1" Ice	6.87 8.25 9.62	6.87 8.25 9.62	850.00 1020.00 1190.00
***									
RRUS-32 (Full Frontal Shielding) (AT&T)	A	From Leg	1.50 -2.00 0.50	30.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (Full Frontal Shielding) (AT&T)	B	From Leg	1.50 -2.00 0.50	60.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (Full Frontal Shielding) (AT&T)	D	From Leg	1.50 -2.00 0.50	0.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (AT&T)	A	From Leg	1.50 2.00 2.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (AT&T)	B	From Leg	1.50 2.00 2.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (AT&T)	D	From Leg	1.50 2.00 2.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (Full Frontal Shielding) (AT&T)	A	From Leg	1.50 5.00 0.50	30.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (Full Frontal Shielding) (AT&T)	B	From Leg	1.50 5.00 0.50	60.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
RRUS-32 (Full Frontal Shielding) (AT&T)	D	From Leg	1.50 5.00 0.50	0.0000	76.70	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.42 2.64 2.86	77.00 104.93 136.47
DC6-48-60-18-8F (AT&T)	B	From Leg	2.00 2.00 2.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	2.20 2.40 2.60	2.20 2.40 2.60	20.00 42.56 68.29
DC6-48-60-18-8F (AT&T)	B	From Leg	2.00 2.00 0.50	60.0000	76.70	No Ice 1/2" Ice 1" Ice	2.20 2.40 2.60	2.20 2.40 2.60	20.00 42.56 68.29
TPA65R-BU6DA-K (AT&T)	A	From Leg	2.00 -5.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	69.00 142.96 223.56

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
TPA65R-BU6DA-K (AT&T)	B	From Leg	2.00 -5.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	69.00 142.96 223.56
TPA65R-BU6DA-K (AT&T)	D	From Leg	2.00 -5.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	69.00 142.96 223.56
AIR6449 B77D (AT&T)	A	From Leg	2.00 -2.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	4.05 4.32 4.59	2.74 2.97 3.20	95.50 129.12 166.64
AIR6449 B77D (AT&T)	B	From Leg	2.00 -2.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	4.05 4.32 4.59	2.74 2.97 3.20	95.50 129.12 166.64
AIR6449 B77D (AT&T)	D	From Leg	2.00 -2.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	4.05 4.32 4.59	2.74 2.97 3.20	95.50 129.12 166.64
AIR6419 B77G (AT&T)	A	From Leg	2.00 -2.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	4.17 4.44 4.71	2.02 2.23 2.44	55.40 84.59 117.51
AIR6419 B77G (AT&T)	B	From Leg	2.00 -2.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	4.17 4.44 4.71	2.02 2.23 2.44	55.40 84.59 117.51
AIR6419 B77G (AT&T)	D	From Leg	2.00 -2.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	4.17 4.44 4.71	2.02 2.23 2.44	55.40 84.59 117.51
DMP65R-BU6DA (AT&T)	A	From Leg	2.00 5.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	80.00 153.96 234.56
DMP65R-BU6DA (AT&T)	B	From Leg	2.00 5.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	80.00 153.96 234.56
DMP65R-BU6DA (AT&T)	C	From Leg	2.00 5.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	80.00 153.96 234.56
4478 RRU (AT&T)	A	From Leg	1.50 2.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	0.91 1.03 1.17	60.00 74.20 90.89
4478 RRU (AT&T)	B	From Leg	1.50 2.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	0.91 1.03 1.17	60.00 74.20 90.89
4478 RRU (AT&T)	D	From Leg	1.50 2.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	0.91 1.03 1.17	60.00 74.20 90.89
4449 RRU (AT&T)	A	From Leg	1.50 2.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.02 1.15 1.28	74.00 90.04 108.70
4449 RRU (AT&T)	B	From Leg	1.50 2.00 0.00	60.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.02 1.15 1.28	74.00 90.04 108.70
4449 RRU (AT&T)	D	From Leg	1.50 2.00 0.00	0.0000	76.70	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	1.02 1.15 1.28	74.00 90.04 108.70
DC9-48-60-24-8C-EV (AT&T)	A	From Leg	2.00 0.00 0.00	30.0000	76.70	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.20	4.78 5.06 5.35	16.00 53.06 94.20
(3) 12' Sector Frames (AT&T)	C	None		0.0000	76.70	No Ice 1/2" Ice 1" Ice	25.00 37.00 47.00	25.00 37.00 47.00	800.00 1100.00 1500.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
***									
Ring Mount	C	None		0.0000	75.00	No Ice	6.87	6.87	850.00
						1/2" Ice	8.25	8.25	1020.00
						1" Ice	9.62	9.62	1190.00
***									
2-3/8" x 8' Pipe Mount	A	From Leg	0.00 0.00 0.00	0.0000	73.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	30.00 44.37 64.01
***									
Ring Mount	C	None		0.0000	67.70	No Ice	6.87	6.87	850.00
						1/2" Ice	8.25	8.25	1020.00
						1" Ice	9.62	9.62	1190.00

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	3728.23					
Bracing Weight	5215.45					
Total Member Self-Weight	8943.69			-2924.94	-1888.15	
Gusset Weight	111.27					
Total Weight	18136.42			-2924.94	-1888.15	
Wind 0 deg - No Ice		-172.29	-19042.55	-1086249.57	11413.26	517.48
Wind 45 deg - No Ice		15562.18	-15546.55	-857381.49	-857331.29	2979.08
Wind 90 deg - No Ice		20506.37	172.29	10376.47	-1144248.41	-3616.04
Wind 135 deg - No Ice		15805.84	15790.21	870342.64	-876142.33	-7152.66
Wind 180 deg - No Ice		172.29	19042.55	1080399.69	-15189.56	-517.48
Wind 225 deg - No Ice		-15562.18	15546.55	851531.60	853554.99	-2979.08
Wind 270 deg - No Ice		-20506.37	-172.29	-16226.35	1140472.10	3616.04
Wind 315 deg - No Ice		-15805.84	-15790.21	-876192.52	872366.02	7152.66
Member Ice	11293.92					
Gusset Ice	118.44					
Total Weight Ice	40193.86			-3858.81	-11706.05	
Wind 0 deg - Ice		-30.31	-4705.11	-273613.25	-9365.10	1535.40
Wind 45 deg - Ice		3820.71	-3817.93	-214601.56	-222621.10	1968.23
Wind 90 deg - Ice		5144.73	30.31	-1517.86	-298208.14	-253.89
Wind 135 deg - Ice		3863.57	3860.79	210194.55	-225931.70	-2039.96
Wind 180 deg - Ice		30.31	4705.11	265895.64	-14047.00	-1535.40
Wind 225 deg - Ice		-3820.71	3817.93	206883.95	199209.00	-1968.23
Wind 270 deg - Ice		-5144.73	-30.31	-6199.75	274796.04	253.89
Wind 315 deg - Ice		-3863.57	-3860.79	-217912.16	202519.60	2039.96
Total Weight	18136.42			-2924.94	-1888.15	
Wind 0 deg - Service		-43.07	-4760.64	-275534.50	6802.58	129.37
Wind 45 deg - Service		3890.55	-3886.64	-218317.48	-210383.55	744.77
Wind 90 deg - Service		5126.59	43.07	-1377.99	-282112.83	-904.01
Wind 135 deg - Service		3951.46	3947.55	213613.55	-215086.31	-1788.16
Wind 180 deg - Service		43.07	4760.64	266127.81	151.88	-129.37
Wind 225 deg - Service		-3890.55	3886.64	208910.79	217338.02	-744.77
Wind 270 deg - Service		-5126.59	-43.07	-8028.70	289067.30	904.01

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 315 deg - Service		-3951.46	-3947.55	-223020.24	222040.78	1788.16

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg D	Max. Vert	12	70615.66	8774.93	-8669.13
	Max. H_x	12	70615.66	8774.93	-8669.13
	Max. H_z	5	-61480.32	-7599.19	7480.90
	Min. Vert	5	-61480.32	-7599.19	7480.90
	Min. H_x	5	-61480.32	-7599.19	7480.90
	Min. H_z	12	70615.66	8774.93	-8669.13
Leg C	Max. Vert	8	72226.67	-8734.40	-9036.86

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_x	17	-62788.26	7558.67	7811.76
	Max. H_z	17	-62788.26	7558.67	7811.76
	Min. Vert	17	-62788.26	7558.67	7811.76
	Min. H_x	8	72226.67	-8734.40	-9036.86
	Min. H_z	8	72226.67	-8734.40	-9036.86
Leg B	Max. Vert	4	71057.13	-8696.43	8804.04
	Max. H_x	13	-61149.22	7458.83	-7578.95
	Max. H_z	4	71057.13	-8696.43	8804.04
	Min. Vert	13	-61149.22	7458.83	-7578.95
	Min. H_x	4	71057.13	-8696.43	8804.04
	Min. H_z	13	-61149.22	7458.83	-7578.95
Leg A	Max. Vert	16	72321.76	9043.10	8742.46
	Max. H_x	16	72321.76	9043.10	8742.46
	Max. H_z	16	72321.76	9043.10	8742.46
	Min. Vert	9	-62716.93	-7805.49	-7554.22
	Min. H_x	9	-62716.93	-7805.49	-7554.22
	Min. H_z	9	-62716.93	-7805.49	-7554.22

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	18136.42	0.00	0.00	-2924.94	-1888.15	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	21763.70	-172.29	-19042.55	-1087357.37	11035.62	517.48
0.9 Dead+1.0 Wind 0 deg - No Ice	16322.78	-172.29	-19042.55	-1086479.89	11602.07	517.48
1.2 Dead+1.0 Wind 45 deg - No Ice	21763.70	15562.18	-15546.56	-858585.52	-858327.97	2979.08
0.9 Dead+1.0 Wind 45 deg - No Ice	16322.78	15562.18	-15546.56	-857708.04	-857761.53	2979.08
1.2 Dead+1.0 Wind 90 deg - No Ice	21763.70	20506.37	172.29	9791.48	-1145394.65	-3616.03
0.9 Dead+1.0 Wind 90 deg - No Ice	16322.78	20506.37	172.29	10668.96	-1144828.21	-3616.03
1.2 Dead+1.0 Wind 135 deg - No Ice	21763.70	15805.84	15790.21	870376.70	-877139.01	-7152.65
0.9 Dead+1.0 Wind 135 deg - No Ice	16322.78	15805.84	15790.21	871254.18	-876572.56	-7152.65
1.2 Dead+1.0 Wind 180 deg - No Ice	21763.70	172.29	19042.55	1080337.52	-15567.19	-517.48
0.9 Dead+1.0 Wind 180 deg - No Ice	16322.78	172.29	19042.55	1081215.00	-15000.75	-517.48
1.2 Dead+1.0 Wind 225 deg - No Ice	21763.70	-15562.18	15546.56	851565.67	853796.40	-2979.08
0.9 Dead+1.0 Wind 225 deg - No Ice	16322.78	-15562.18	15546.56	852443.15	854362.85	-2979.08
1.2 Dead+1.0 Wind 270 deg - No Ice	21763.70	-20506.37	-172.29	-16811.33	1140863.08	3616.03
0.9 Dead+1.0 Wind 270 deg - No Ice	16322.78	-20506.37	-172.29	-15933.85	1141429.53	3616.03
1.2 Dead+1.0 Wind 315 deg - No Ice	21763.70	-15805.84	-15790.21	-877396.55	872607.44	7152.65
0.9 Dead+1.0 Wind 315 deg - No Ice	16322.78	-15805.84	-15790.21	-876519.07	873173.88	7152.65
1.2 Dead+1.0 Ice+1.0 Temp	43660.02	0.00	0.00	-4443.79	-12083.68	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	43660.02	-30.31	-4705.11	-274381.69	-9742.73	1535.40
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	43660.02	3820.71	-3817.93	-215359.52	-223171.71	1968.23
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	43660.02	5144.73	30.31	-2102.84	-298849.06	-253.89
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	43660.02	3863.57	3860.80	209782.55	-226482.31	-2039.96
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	43660.02	30.31	4705.12	265494.11	-14424.63	-1535.39
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	43660.02	-3820.71	3817.93	206471.95	199004.35	-1968.23
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	43660.02	-5144.73	-30.31	-6784.74	274681.70	253.89
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	43660.02	-3863.57	-3860.80	-218670.13	202314.95	2039.97
Dead+Wind 0 deg - Service	18136.42	-43.07	-4760.64	-273886.80	1437.20	129.37
Dead+Wind 45 deg - Service	18136.42	3890.55	-3886.64	-216693.84	-215903.70	744.77
Dead+Wind 90 deg - Service	18136.42	5126.59	43.07	400.41	-287670.37	-904.01
Dead+Wind 135 deg - Service	18136.42	3951.46	3947.55	215546.72	-220606.46	-1788.16
Dead+Wind 180 deg - Service	18136.42	43.07	4760.64	268036.92	-5213.51	-129.37
Dead+Wind 225 deg - Service	18136.42	-3890.55	3886.64	210843.96	212127.39	-744.77
Dead+Wind 270 deg - Service	18136.42	-5126.59	-43.07	-6250.29	283894.06	904.01
Dead+Wind 315 deg - Service	18136.42	-3951.46	-3947.55	-221396.59	216830.15	1788.16

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-18136.42	0.00	-0.00	18136.42	-0.00	0.000%
2	-172.29	-21763.70	-19042.55	172.29	21763.70	19042.55	0.000%
3	-172.29	-16322.78	-19042.55	172.29	16322.78	19042.55	0.000%
4	15562.18	-21763.70	-15546.55	-15562.18	21763.70	15546.56	0.000%
5	15562.18	-16322.78	-15546.55	-15562.18	16322.78	15546.56	0.000%
6	20506.37	-21763.70	172.29	-20506.37	21763.70	-172.29	0.000%
7	20506.37	-16322.78	172.29	-20506.37	16322.78	-172.29	0.000%
8	15805.84	-21763.70	15790.21	-15805.84	21763.70	-15790.21	0.000%
9	15805.84	-16322.78	15790.21	-15805.84	16322.78	-15790.21	0.000%
10	172.29	-21763.70	19042.55	-172.29	21763.70	-19042.55	0.000%
11	172.29	-16322.78	19042.55	-172.29	16322.78	-19042.55	0.000%
12	-15562.18	-21763.70	15546.55	15562.18	21763.70	-15546.56	0.000%
13	-15562.18	-16322.78	15546.55	15562.18	16322.78	-15546.56	0.000%
14	-20506.37	-21763.70	-172.29	20506.37	21763.70	172.29	0.000%
15	-20506.37	-16322.78	-172.29	20506.37	16322.78	172.29	0.000%
16	-15805.84	-21763.70	-15790.21	15805.84	21763.70	15790.21	0.000%
17	-15805.84	-16322.78	-15790.21	15805.84	16322.78	15790.21	0.000%
18	0.00	-43660.02	0.00	-0.00	43660.02	-0.00	0.000%
19	-30.31	-43660.02	-4705.11	30.31	43660.02	4705.11	0.000%
20	3820.71	-43660.02	-3817.93	-3820.71	43660.02	3817.93	0.000%
21	5144.73	-43660.02	30.31	-5144.73	43660.02	-30.31	0.000%
22	3863.57	-43660.02	3860.79	-3863.57	43660.02	-3860.80	0.000%
23	30.31	-43660.02	4705.11	-30.31	43660.02	-4705.12	0.000%
24	-3820.71	-43660.02	3817.93	3820.71	43660.02	-3817.93	0.000%
25	-5144.73	-43660.02	-30.31	5144.73	43660.02	30.31	0.000%
26	-3863.57	-43660.02	-3860.79	3863.57	43660.02	3860.80	0.000%
27	-43.07	-18136.42	-4760.64	43.07	18136.42	4760.64	0.000%
28	3890.55	-18136.42	-3886.64	-3890.55	18136.42	3886.64	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
29	5126.59	-18136.42	43.07	-5126.59	18136.42	-43.07	0.000%
30	3951.46	-18136.42	3947.55	-3951.46	18136.42	-3947.55	0.000%
31	43.07	-18136.42	4760.64	-43.07	18136.42	-4760.64	0.000%
32	-3890.55	-18136.42	3886.64	3890.55	18136.42	-3886.64	0.000%
33	-5126.59	-18136.42	-43.07	5126.59	18136.42	43.07	0.000%
34	-3951.46	-18136.42	-3947.55	3951.46	18136.42	3947.55	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	90.333 - 78.063	0.957	34	0.0843	0.0089
T2	78.063 - 74.563	0.741	34	0.0806	0.0076
T3	74.563 - 72.313	0.680	34	0.0789	0.0070
T4	72.313 - 67.563	0.641	34	0.0777	0.0065
T5	67.563 - 65.438	0.557	34	0.0732	0.0051
T6	65.438 - 57.521	0.523	34	0.0711	0.0046
T7	57.521 - 50.271	0.407	34	0.0613	0.0029
T8	50.271 - 41.979	0.315	34	0.0528	0.0021
T9	41.979 - 34.187	0.226	34	0.0442	0.0014
T10	34.187 - 26.895	0.154	34	0.0368	0.0010
T11	26.895 - 20.103	0.099	34	0.0292	0.0007
T12	20.103 - 13.415	0.057	34	0.0229	0.0005
T13	13.415 - 6.7075	0.026	34	0.0139	0.0002
T14	6.7075 - 0	0.003	32	0.0073	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.50	6' x 5/8" Lighting Rod	34	0.957	0.0843	0.0089	308829
90.00	NNH4-65B-R6	34	0.952	0.0842	0.0088	308829
77.00	Ring Mount	34	0.723	0.0801	0.0074	155277
76.70	RRUS-32 (Full Frontal Shielding)	34	0.717	0.0800	0.0074	149561
75.00	Ring Mount	34	0.687	0.0791	0.0070	240664
73.00	2-3/8" x 8' Pipe Mount	34	0.653	0.0781	0.0067	138726
67.70	Ring Mount	34	0.560	0.0733	0.0051	29893

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	90.333 - 78.063	3.746	16	0.3215	0.0354
T2	78.063 - 74.563	2.918	16	0.3108	0.0305
T3	74.563 - 72.313	2.680	16	0.3048	0.0279

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T4	72.313 - 67.563	2.530	16	0.3008	0.0261
T5	67.563 - 65.438	2.204	16	0.2845	0.0204
T6	65.438 - 57.521	2.070	16	0.2771	0.0185
T7	57.521 - 50.271	1.615	16	0.2405	0.0118
T8	50.271 - 41.979	1.254	16	0.2081	0.0083
T9	41.979 - 34.187	0.898	16	0.1749	0.0055
T10	34.187 - 26.895	0.614	16	0.1458	0.0041
T11	26.895 - 20.103	0.394	16	0.1160	0.0029
T12	20.103 - 13.415	0.227	16	0.0910	0.0019
T13	13.415 - 6.7075	0.105	16	0.0552	0.0010
T14	6.7075 - 0	0.012	8	0.0290	0.0005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.50	6' x 5/8" Lighting Rod	16	3.746	0.3215	0.0354	91386
90.00	NNH4-65B-R6	16	3.724	0.3213	0.0353	91386
77.00	Ring Mount	16	2.845	0.3090	0.0297	56067
76.70	RRUS-32 (Full Frontal Shielding)	16	2.824	0.3084	0.0295	53474
75.00	Ring Mount	16	2.709	0.3055	0.0282	102187
73.00	2-3/8" x 8' Pipe Mount	16	2.576	0.3023	0.0267	40775
67.70	Ring Mount	16	2.213	0.2850	0.0206	8142

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	90.333	Leg	A307	0.6250	12	855.83	16240.00	0.053 ✔	1	Bearing
		Diagonal	A325N	0.6240	1	1649.75	9492.94	0.174 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	102.68	8482.50	0.012 ✔	1	Member Bearing
T2	78.063	Diagonal	A325N	0.5410	2	1458.29	5577.24	0.261 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	2	365.57	11010.90	0.033 ✔	1	Member Block Shear
T3	74.563	Diagonal	A325N	0.5410	2	1670.60	7208.49	0.232 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	3	292.52	10059.40	0.029 ✔	1	Member Block Shear
T4	72.313	Diagonal	A325N	0.5410	2	2612.11	7208.49	0.362 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	3	615.88	15080.00	0.041 ✔	1	Gusset Bearing
T5	67.563	Diagonal	A325N	0.5410	2	2008.95	5577.24	0.360 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	3	163.77	10059.40	0.016 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T6	65.438	Diagonal	A325N	0.5410	2	1629.94	6188.96	0.263 ✔	1	Member Block Shear
T7	57.521	Diagonal	A325N	0.5410	2	1482.09	6188.96	0.239 ✔	1	Member Block Shear
T8	50.271	Leg	A307	0.6250	12	6951.14	17257.30	0.403 ✔	1	Bolt DS
		Diagonal	A325N	0.5410	2	1379.33	6188.96	0.223 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	3	208.93	6728.91	0.031 ✔	1	Member Block Shear
T9	41.979	Diagonal	A325N	0.5410	2	1408.66	6188.96	0.228 ✔	1	Member Block Shear
T10	34.187	Diagonal	A325N	0.5410	2	1260.12	6188.96	0.204 ✔	1	Member Block Shear
T11	26.895	Diagonal	A325N	0.5410	2	1329.08	6188.96	0.215 ✔	1	Member Block Shear
T12	20.103	Leg	A307	0.6250	12	10821.20	17257.30	0.627 ✔	1	Bolt DS
		Diagonal	A325N	0.5410	2	2347.68	7208.49	0.326 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	1921.33	9487.50	0.203 ✔	1	Member Block Shear
T13	13.415	Diagonal	A325N	0.5410	2	3370.88	10344.20	0.326 ✔	1	Bolt Shear
		Redund Horz 1 Bracing	A325N	0.5000	1	936.75	5709.38	0.164 ✔	1	Member Block Shear
		Redund Diag 1 Bracing	A325N	0.5000	1	721.67	5709.38	0.126 ✔	1	Member Block Shear
T14	6.7075	Diagonal	A325N	0.5410	2	3496.98	10344.20	0.338 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	943.41	6096.09	0.155 ✔	1	Member Block Shear
		Redund Horz 1 Bracing	A325N	0.5000	1	943.41	5709.38	0.165 ✔	1	Member Block Shear
		Redund Diag 1 Bracing	A325N	0.5000	1	679.00	5709.38	0.119 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L4x4x1/4	12.27	6.08	91.8 K=1.00	1.9400	-5135.01	50194.10	0.102 [1] ✔
T2	78.063 - 74.563	L4x4x3/8	3.50	3.50	53.3 K=1.00	2.8600	-11070.20	93762.70	0.118 [1] ✔
T3	74.563 - 72.313	L4x4x3/8	2.25	2.25	34.3 K=1.00	2.8600	-11133.20	99159.10	0.112 [1] ✔
T4	72.313 - 67.563	L4x4x3/8	4.75	4.75	72.3 K=1.00	2.8600	-20249.50	86020.10	0.235 [1] ✔
T5	67.563 -	L4x4x3/8	2.13	0.13	1.9	2.8600	-26119.10	102948.00	0.254 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	65.438				K=1.00				✓
T6	65.438 - 57.521	L4x4x3/8	7.95	7.95	121.0 K=1.00	2.8600	-29068.70	55545.30	0.523 [1] ✓
T7	57.521 - 50.271	L4x4x3/8	7.28	7.28	110.8 K=1.00	2.8600	-36797.90	63198.00	0.582 [1] ✓
T8	50.271 - 41.979	L5x5x3/8	8.32	8.32	100.9 K=1.00	3.6100	-41706.80	88365.70	0.472 [1] ✓
T9	41.979 - 34.187	L5x5x3/8	7.82	7.82	94.8 K=1.00	3.6100	-48551.40	93230.70	0.521 [1] ✓
T10	34.187 - 26.895	L5x5x3/8	7.32	7.32	88.7 K=1.00	3.6100	-53268.70	97793.20	0.545 [1] ✓
T11	26.895 - 20.103	L5x5x3/8	6.82	6.82	82.6 K=1.00	3.6100	-57637.10	102053.00	0.565 [1] ✓
T12	20.103 - 13.415	L5x5x5/16	6.71	6.71	81.0 K=1.00	3.0300	-64926.90	84358.10	0.770 [1] ✓
T13	13.415 - 6.7075	L5x5x5/16	6.73	3.37	40.6 K=1.00	3.0300	-62333.40	100100.00	0.623 [1] ✓
T14	6.7075 - 0	L5x5x5/16	6.73	3.37	40.6 K=1.00	3.0300	-62776.00	100100.00	0.627 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2x2x1/4	7.90	3.69	113.2 K=1.00	0.9380	-1674.43	20156.50	0.083 [1] ✓
T2	78.063 - 74.563	L2x2 1/2x3/16	4.31	4.03	113.2 K=1.00	0.8090	-3382.03	17388.40	0.194 [1] ✓
T3	74.563 - 72.313	L2 1/2x2 1/2x3/16	3.38	3.16	76.5 K=1.00	0.9020	-3996.79	26497.00	0.151 [1] ✓
T4	72.313 - 67.563	L2 1/2x2 1/2x3/16	5.38	5.02	121.7 K=1.00	0.9020	-5812.34	17338.40	0.335 [1] ✓
T5	67.563 - 65.438	L2x2x3/16	3.22	3.01	91.5 K=1.00	0.7150	-4908.30	18959.90	0.259 [1] ✓
T6	65.438 - 57.521	L2x2 1/2x3/16	9.67	4.97	139.7 K=1.00	0.8090	-3514.52	11872.90	0.296 [1] ✓
T7	57.521 - 50.271	L2x2 1/2x3/16	9.72	4.95	139.0 K=1.00	0.8090	-2841.76	11987.10	0.237 [1] ✓
T8	50.271 - 41.979	L2x2 1/2x3/16	11.14	5.64	158.5 K=1.00	0.8090	-2919.84	9221.79	0.317 [1] ✓
T9	41.979 - 34.187	L2x2 1/2x3/16	11.47	5.78	162.4 K=1.00	0.8090	-2751.95	8781.19	0.313 [1] ✓
T10	34.187 - 26.895	L2x2 1/2x3/16	11.85	5.95	167.1 K=1.00	0.8090	-2593.84	8293.25	0.313 [1] ✓
T11	26.895 - 20.103	L2x2 1/2x3/16	12.26	6.13	172.3 K=1.00	0.8090	-2669.41	7801.97	0.342 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T12	20.103 - 13.415	L2 1/2x2 1/2x3/16	12.90	6.45	156.3 K=1.00	0.9020	-4092.55	10566.60	0.387 [1] ✔
T13	13.415 - 6.7075	L3x3x5/16	8.82	8.50	110.7 K=1.00	1.7800	-6741.75	39401.70	0.171 [1] ✔
T14	6.7075 - 0	L3x3x5/16	9.38	9.08	118.2 K=1.00	1.7800	-6993.96	35938.10	0.195 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	74.563 - 72.313	L4x3 1/2x1/4	5.04	3.53	39.4 K=1.00	1.8100	-884.12	59980.20	0.015 [1] ✔
T5	67.563 - 65.438	L4x3 1/2x1/4	5.04	3.53	39.4 K=1.00	1.8100	-487.75	59980.20	0.008 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	12.26	5.92	206.9 K=1.00	0.6211	-943.41	4152.93	0.227 [1] ✔
		KL/R > 200 (C) - 219							

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2 1/2x2 1/2x3/16	5.04	4.71	114.1 K=1.00	0.9020	-124.40	19169.70	0.006 [1] ✔
T2	78.063 - 74.563	L4x3 1/2x1/4	5.04	3.53	57.7 K=1.00	1.8100	-537.54	56580.10	0.010 [1] ✔
T4	72.313 - 67.563	2L4x4x3/8	5.04	4.71	45.9 K=1.00	5.7200	-1208.11	187393.00	0.006 [1] ✔
T8	50.271 - 41.979	L2 1/2x2 1/2x3/16	6.91	6.49	157.3 K=1.00	0.9020	-626.78	10431.90	0.060 [1] ✔
T12	20.103 - 13.415	L2x2 1/2x1/4	10.61	10.20	288.6 K=1.00	1.0600	-2264.09	3642.36	0.622 [1] ✔
		KL/R > 200 (C) - 190							

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T5	67.563 - 65.438	L3x3x3/16	5.04	3.53	71.1 K=1.00	1.0900	-957.91	32089.70	0.030 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	3.06	2.86	99.8 K=1.00	0.6211	-936.75	15355.50	0.061 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	3.06	2.86	99.8 K=1.00	0.6211	-943.41	15355.50	0.061 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	4.69	4.39	153.4 K=1.00	0.6211	-721.67	7552.38	0.096 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	4.41	4.09	142.9 K=1.00	0.6211	-679.00	8699.96	0.078 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	78.063 - 74.563	L2 1/2x2x3/16	3.56	3.23	90.8 K=1.00	0.8090	-6.14	21570.60	0.000 [1] ✔
T5	67.563 - 65.438	L2 1/2x2x3/16	3.56	3.23	90.8 K=1.00	0.8090	-3.59	21570.60	0.000 [1] ✔
T12	20.103 - 13.415	L2x2x3/16	15.01	14.59	444.5 K=1.00	0.7150	-131.79	1035.81	0.127 [1] ✔
		KL/R > 250 (C) - 187							

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L4x4x1/4	12.27	6.08	58.4	1.9400	3557.06	62856.00	0.057 [1] ✓
T2	78.063 - 74.563	L4x4x3/8	3.50	3.50	34.1	2.8600	7901.13	92664.00	0.085 [1] ✓
T3	74.563 - 72.313	L4x4x3/8	2.25	2.25	22.0	2.8600	7262.08	92664.00	0.078 [1] ✓
T4	72.313 - 67.563	L4x4x3/8	4.75	4.75	46.3	2.8600	15889.80	92664.00	0.171 [1] ✓
T5	67.563 - 65.438	L4x4x3/8	2.13	0.13	1.2	2.8600	20337.60	92664.00	0.219 [1] ✓
T6	65.438 - 57.521	L4x4x3/8	7.95	7.95	77.5	2.8600	23486.00	92664.00	0.253 [1] ✓
T7	57.521 - 50.271	L4x4x3/8	7.28	7.28	71.0	2.8600	30413.90	92664.00	0.328 [1] ✓
T8	50.271 - 41.979	L5x5x3/8	8.32	8.32	64.0	3.6100	35275.50	116964.00	0.302 [1] ✓
T9	41.979 - 34.187	L5x5x3/8	7.82	7.82	60.2	3.6100	41423.30	116964.00	0.354 [1] ✓
T10	34.187 - 26.895	L5x5x3/8	7.32	7.32	56.3	3.6100	45911.00	116964.00	0.393 [1] ✓
T11	26.895 - 20.103	L5x5x3/8	6.82	6.82	52.4	3.6100	49840.00	116964.00	0.426 [1] ✓
T12	20.103 - 13.415	L5x5x5/16	6.71	6.71	51.3	3.0300	56030.30	98172.00	0.571 [1] ✓
T13	13.415 - 6.7075	L5x5x5/16	6.73	3.37	25.7	3.0300	54872.90	98172.00	0.559 [1] ✓
T14	6.7075 - 0	L5x5x5/16	6.73	3.37	25.7	3.0300	54885.80	98172.00	0.559 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 - 78.063	L2x2x1/4	7.90	3.69	72.7	0.5631	1649.75	24493.20	0.067 [1] ✓
T2	78.063 - 74.563	L2x2 1/2x3/16	4.31	4.03	80.6	0.5131	2916.59	22319.60	0.131 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	74.563 - 72.313	L2 1/2x2 1/2x3/16	3.38	3.16	48.7	0.5828	3341.19	25353.70	0.132 [1] ✔
T4	72.313 - 67.563	L2 1/2x2 1/2x3/16	5.38	5.02	77.5	0.5828	5224.22	25353.70	0.206 [1] ✔
T5	67.563 - 65.438	L2x2x3/16	3.22	3.01	58.4	0.4426	4017.89	19252.80	0.209 [1] ✔
T6	65.438 - 57.521	L2x2 1/2x3/16	9.67	4.97	99.4	0.5131	3259.88	22319.60	0.146 [1] ✔
T7	57.521 - 50.271	L2x2 1/2x3/16	9.72	4.95	99.0	0.5131	2964.18	22319.60	0.133 [1] ✔
T8	50.271 - 41.979	L2x2 1/2x3/16	11.14	5.64	112.8	0.5131	2758.66	22319.60	0.124 [1] ✔
T9	41.979 - 34.187	L2x2 1/2x3/16	11.47	5.78	115.6	0.5131	2817.32	22319.60	0.126 [1] ✔
T10	34.187 - 26.895	L2x2 1/2x3/16	11.85	5.95	119.0	0.5131	2520.24	22319.60	0.113 [1] ✔
T11	26.895 - 20.103	L2x2 1/2x3/16	12.26	6.13	122.7	0.5131	2658.16	22319.60	0.119 [1] ✔
T12	20.103 - 13.415	L2 1/2x2 1/2x3/16	12.90	6.45	99.5	0.5828	4695.37	25353.70	0.185 [1] ✔
T13	13.415 - 6.7075	L3x3x5/16	8.82	8.50	110.7	1.1789	5923.86	51282.40	0.116 [1] ✔
T14	6.7075 - 0	L3x3x5/16	9.38	9.08	118.2	1.1789	5962.28	51282.40	0.116 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	74.563 - 72.313	L4x3 1/2x1/4	5.04	3.53	39.4	1.2169	877.56	52934.10	0.017 [1] ✔
T5	67.563 - 65.438	L4x3 1/2x1/4	5.04	3.53	39.4	1.2169	491.30	52934.10	0.009 [1] ✔
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	12.26	5.92	198.5	0.3604	943.41	15675.30	0.060 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	90.333 -	L2 1/2x2 1/2x3/16	5.04	4.71	72.6	0.5710	102.68	24839.90	0.004 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	78.063								✓
T2	78.063 - 74.563	L4x3 1/2x1/4	5.04	3.53	44.6	1.2169	731.14	52934.10	0.014 [1] ✓
T4	72.313 - 67.563	2L4x4x3/8	5.04	4.71	45.9	3.8681	1847.63	168263.00	0.011 [1] ✓
T8	50.271 - 41.979	L2 1/2x2 1/2x3/16	6.91	6.49	100.1	0.5710	626.78	24839.90	0.025 [1] ✓
T12	20.103 - 13.415	L2x2 1/2x1/4	10.61	10.20	206.6	0.6544	1921.33	28465.30	0.067 [1] ✓

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	67.563 - 65.438	L3x3x3/16	5.04	3.53	60.2	1.0900	1207.14	35316.00	0.034 [1] ✓

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	3.06	2.86	63.8	0.3779	936.75	16439.90	0.057 [1] ✓
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	3.06	2.86	63.8	0.3779	943.41	16439.90	0.057 [1] ✓

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	13.415 - 6.7075	L1 3/4x1 3/4x3/16	4.69	4.39	98.1	0.3779	721.67	16439.90	0.044 [1] ✓
T14	6.7075 - 0	L1 3/4x1 3/4x3/16	4.41	4.09	91.4	0.3779	679.00	16439.90	0.041 [1] ✓

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

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	78.063 - 74.563	L2 1/2x2x3/16	7.13	6.80	136.0	0.8090	90.88	26211.60	0.003 [1] ✔
T5	67.563 - 65.438	L2 1/2x2x3/16	7.13	6.80	136.0	0.8090	192.41	26211.60	0.007* [1] ✔
T8	50.271 - 41.979	L2 1/2x2x3/16	9.77	9.35	187.1	0.8090	29.18	26211.60	0.001* [1] ✔
T12	20.103 - 13.415	L2x2x3/16	15.01	14.59	283.8	0.7150	202.74	23166.00	0.009 [1] ✔

* DL controls

[1] P_u / ϕP_n controls

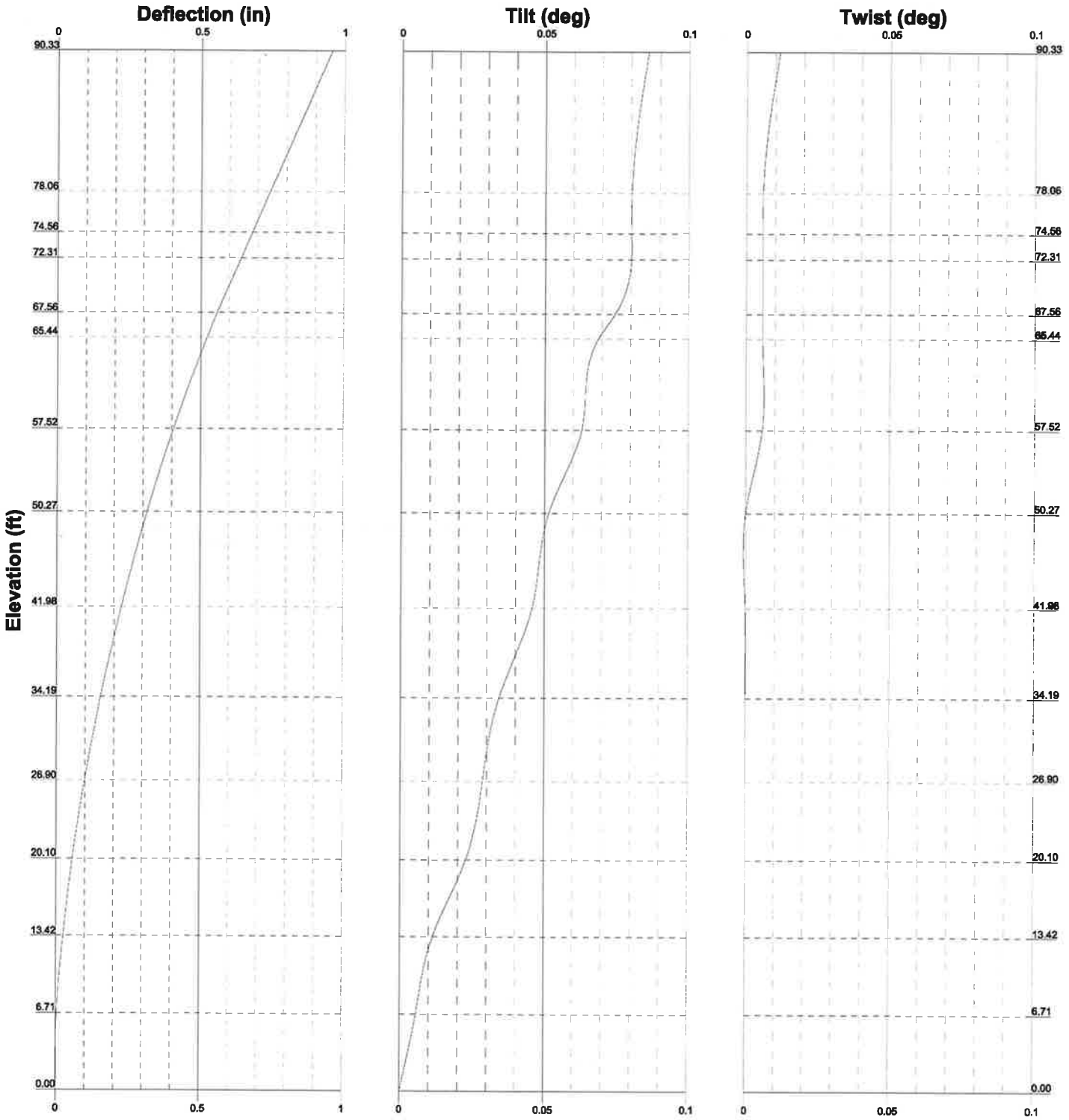
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	90.333 - 78.063	Leg	L4x4x1/4	4	-5135.01	50194.10	10.2	Pass
T2	78.063 - 74.563	Leg	L4x4x3/8	28	-11070.20	93762.70	11.8	Pass
T3	74.563 - 72.313	Leg	L4x4x3/8	54	-11133.20	99159.10	11.2	Pass
T4	72.313 - 67.563	Leg	L4x4x3/8	66	-20249.50	86020.10	23.5	Pass
T5	67.563 - 65.438	Leg	L4x4x3/8	86	-26119.10	102948.00	25.4	Pass
T6	65.438 - 57.521	Leg	L4x4x3/8	108	-29068.70	55545.30	52.3	Pass
T7	57.521 - 50.271	Leg	L4x4x3/8	120	-36797.90	63198.00	58.2	Pass
T8	50.271 - 41.979	Leg	L5x5x3/8	132	-41706.80	88365.70	47.2	Pass
T9	41.979 - 34.187	Leg	L5x5x3/8	150	-48551.40	93230.70	52.1	Pass
T10	34.187 - 26.895	Leg	L5x5x3/8	162	-53268.70	97793.20	54.5	Pass
T11	26.895 - 20.103	Leg	L5x5x3/8	174	-57637.10	102053.00	56.5	Pass
T12	20.103 - 13.415	Leg	L5x5x5/16	186	-64926.90	84358.10	77.0	Pass
T13	13.415 - 6.7075	Leg	L5x5x5/16	204	-62333.40	100100.00	62.3	Pass
T14	6.7075 - 0	Leg	L5x5x5/16	236	-62776.00	100100.00	62.7	Pass
T1	90.333 - 78.063	Diagonal	L2x2x1/4	14	-1674.43	20156.50	8.3	Pass
T2	78.063 - 74.563	Diagonal	L2x2 1/2x3/16	42	-3382.03	17388.40	19.4	Pass
T3	74.563 - 72.313	Diagonal	L2 1/2x2 1/2x3/16	60	-3996.79	26497.00	15.1	Pass
T4	72.313 - 67.563	Diagonal	L2 1/2x2 1/2x3/16	78	-5812.34	17338.40	33.5	Pass
T5	67.563 - 65.438	Diagonal	L2x2x3/16	97	-4908.30	18959.90	25.9	Pass
T6	65.438 - 57.521	Diagonal	L2x2 1/2x3/16	113	-3514.52	11872.90	29.6	Pass
T7	57.521 - 50.271	Diagonal	L2x2 1/2x3/16	125	-2841.76	11987.10	23.7	Pass
T8	50.271 - 41.979	Diagonal	L2x2 1/2x3/16	143	-2919.84	9221.79	31.7	Pass
T9	41.979 - 34.187	Diagonal	L2x2 1/2x3/16	155	-2751.95	8781.19	31.3	Pass
T10	34.187 - 26.895	Diagonal	L2x2 1/2x3/16	167	-2593.84	8293.25	31.3	Pass
T11	26.895 - 20.103	Diagonal	L2x2 1/2x3/16	180	-2669.41	7801.97	34.2	Pass
T12	20.103 - 13.415	Diagonal	L2 1/2x2 1/2x3/16	197	-4092.55	10566.60	38.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T13	13.415 - 6.7075	Diagonal	L3x3x5/16	216	-6741.75	39401.70	17.1	Pass
T14	6.7075 - 0	Diagonal	L3x3x5/16	243	-6993.96	35938.10	19.5	Pass
T3	74.563 - 72.313	Horizontal	L4x3 1/2x1/4	41	877.56	52934.10	1.7	Pass
T5	67.563 - 65.438	Horizontal	L4x3 1/2x1/4	77	491.30	52934.10	0.9	Pass
T14	6.7075 - 0	Horizontal	L1 3/4x1 3/4x3/16	219	-943.41	4152.93	22.7	Pass
T1	90.333 - 78.063	Top Girt	L2 1/2x2 1/2x3/16	5	-124.40	19169.70	0.6	Pass
T2	78.063 - 74.563	Top Girt	L4x3 1/2x1/4	33	731.14	52934.10	1.4	Pass
T4	72.313 - 67.563	Top Girt	2L4x4x3/8	69	1847.63	168263.00	1.1	Pass
T8	50.271 - 41.979	Top Girt	L2 1/2x2 1/2x3/16	137	-626.78	10431.90	6.0	Pass
T12	20.103 - 13.415	Top Girt	L2x2 1/2x1/4	190	-2264.09	3642.36	62.2	Pass
T5	67.563 - 65.438	Bottom Girt	L3x3x3/16	91	1207.14	35316.00	3.4	Pass
T13	13.415 - 6.7075	Redund Horz 1 Bracing	L1 3/4x1 3/4x3/16	224	-936.75	15355.50	6.1	Pass
T14	6.7075 - 0	Redund Horz 1 Bracing	L1 3/4x1 3/4x3/16	253	-943.41	15355.50	6.1	Pass
T13	13.415 - 6.7075	Redund Diag 1 Bracing	L1 3/4x1 3/4x3/16	229	-721.67	7552.38	9.6	Pass
T14	6.7075 - 0	Redund Diag 1 Bracing	L1 3/4x1 3/4x3/16	254	-679.00	8699.96	7.8	Pass
T2	78.063 - 74.563	Inner Bracing	L2 1/2x2x3/16	30	90.88	26211.60	0.3	Pass
T5	67.563 - 65.438	Inner Bracing	L2 1/2x2x3/16	87	192.41	26211.60	0.7	Pass
T8	50.271 - 41.979	Inner Bracing	L2 1/2x2x3/16	133	29.18	26211.60	0.5	Pass
T12	20.103 - 13.415	Inner Bracing	L2x2x3/16	187	-131.79	1035.81	12.7	Pass
							Summary	
						Leg (T12)	77.0	Pass
						Diagonal (T12)	38.7	Pass
						Horizontal (T14)	22.7	Pass
						Top Girt (T12)	62.2	Pass
						Bottom Girt (T5)	3.4	Pass
						Redund Horz 1 Bracing (T14)	6.1	Pass
						Redund Diag 1 Bracing (T13)	9.6	Pass
						Inner Bracing (T12)	12.7	Pass
						Bolt Checks	62.7	Pass
						RATING =	**77.0**	**Pass**

TIA-222-H - Service - 60 mph

Maximum Values

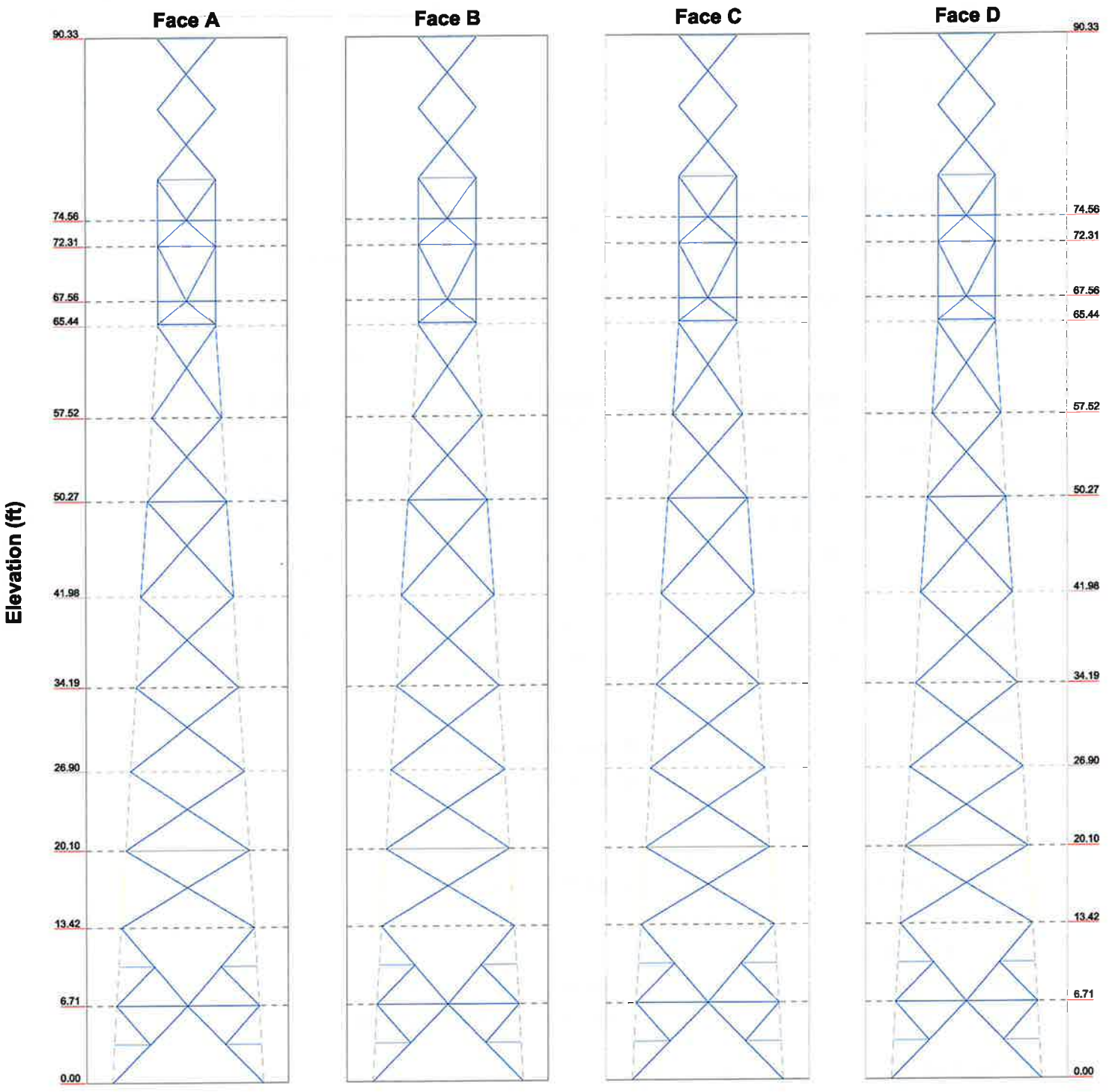


Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: *240022 REV 1*			
Project: *Portland (CT-1680)*			
Client: BST Management, LLC	Drawn by: treed	App'd:	
Code: TIA-222-H	Date: 02/13/24	Scale: NTS	
Path:		Dwg No. E-5	

Stress Distribution Chart
0' - 90'3-31/32"

> 100% 90%-100% 75%-90% 50%-75% < 50% Overstress



Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: *240022 REV 1*			
Project: *Portland (CT-1680)*			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 02/13/24		Scale: NTS
Path:			Dwg No. E-8

PIER/PAD & MAT FOUNDATION

Template = "SquareCombPierPadMat.xmcd"
Version = 4.02

Structural Components
Bringing It All Together.
1870 West 64th Lane, UnitA
Denver, CO 80221
866-386-7622

PROJECT DATA

Job = "240022 REV 1"
Client = "BST Management, LLC"
Site = "Portland (CT-1680)"
Model = "90ft SST"

DESIGN CODES AND STANDARDS

Code = ("TIA-222-H, "Structural Standard for Antenna Supporting Structures and Antennas" 2017."
"ACI 318-14, "Building Code Requirements for Structural Concrete and Commentary," 2014.")

FACTORED FOUNDATION DESIGN LOADS

Overdesign Factor: $\alpha = 1.00$ Percentage for Passing: PP = 100·%
Calculation Mode: calc = "Analysis (no seismic provision check)" reinf' = "Reinforcing Details Available"

	Load Comb. #1	Load Comb. #2	Load Comb. #3
Load Combination:	$Comb_1$ = "1.2D + 1.0W"	$Comb'_2$ = "0.9D + 1.6W"	$Comb_3$ = "1.2D + 1.0Di + 1.0W"
Overall Moment:	$M_{u_1} = 1237.5 \cdot kip \cdot ft$	$M_{u_2} = 928.1 \cdot kip \cdot ft$	$M_{u_3} = 310.2 \cdot kip \cdot ft$
Overall Shear:	$V_{u_1} = 22.4 \cdot kip$	$V_{u_2} = 22.4 \cdot kip$	$V_{u_3} = 5.5 \cdot kip$
Overall Axial:	$P_{u_1} = 21.8 \cdot kip$	$P_{u_2} = 16.3 \cdot kip$	$P_{u_3} = 43.7 \cdot kip$
Leg Moment:	$LM_{u_1} = 0.0 \cdot kip \cdot ft$	$LM_{u_2} = 0.0 \cdot kip \cdot ft$	$LM_{u_3} = 0.0 \cdot kip \cdot ft$
Leg Shear:	$S_{u_1} = 10.8 \cdot kip$	$S_{u_2} = 10.8 \cdot kip$	$S_{u_3} = 12.6 \cdot kip$
Leg Axial:	$Pmax_{u_1} = 72.4 \cdot kip$	$Pmax_{u_2} = 54.3 \cdot kip$	$Pmax_{u_3} = 72.4 \cdot kip$
	$Pmin_{u_1} = -62.8 \cdot kip$	$Pmin_{u_2} = -47.1 \cdot kip$	$Pmin_{u_3} = -61.5 \cdot kip$

DIMENSIONS

Depth:	D = 6.5·ft	(from grade to bottom of pad)
Pad Width:	W = 18.0·ft	(each way)
Pad Thickness:	T = 2.0·ft	
Pier Separation:	Wt = 13.0·ft	
Pier (or mat) Extension:	E = 0.5·ft	(above-grade portion)
Pier: Pier = "Square"	$D_p = 2.0 \cdot ft$	
Base Plate Geometry:	BPG = "None" BP = 0.0·in	
Tower Offset:	ecc1 = 0.0·ft	(center of tower to center of pad)
Tower Leg Offset:	ecc2 = 0.0·ft	(center of tower leg to center of pier)
Concrete Volume:	$V_{pad} = 24.0 \cdot yd^3$	
	$V_{pier} = 0.7 \cdot yd^3$	
	$V_{conc} = 27.0 \cdot yd^3$	

SITE & GEOTECHNICAL DATA

Soil Parameters:	Geo = "GDP, 03/06/2017, Job # 2017702.58"				
Soil Unit Weight:	$\gamma_{soil} = 136.5385 \cdot pcf$				
Soil Cone Override:	soilcone = "N"	$\phi_{cone} = 0.0 \cdot deg$			
Constant Lateral Pressure:	costpres = "N"	$CP_p = 0 \cdot psf$	(for pier)	$CP_P = 0 \cdot psf$	(for pad)
Equivalent Fluid Pressure:	EFpres = "N"	$EFP = 0.0 \cdot pcf$			
Angle of Internal Friction:	$\phi_1 = 15.0 \cdot deg$	(above water table)			
	ϕ_2 = "N/A" $\cdot deg$	(below water table)			
Ultimate Bearing Pressure:	$B'_c = 30.0 \cdot ksf$	Bearing = "Capacity at Depth"			
Cohesion:	$c = 10000 \cdot psf$				
Adhesion:	$c_A = 0 \cdot psf$				
Passive Pressure Coefficient (Rankine):	$K_{p1} = 1.70$	(above water table)	K_{p2} = "N/A"	(below water table)	
Active Pressure Coefficient:	$K_{a1} = 0.59$	(above water table)	K_{a2} = "N/A"	(below water table)	
Ultimate Friction Coefficient:	$\mu = 0.60$	(base)	$\mu_s = 0.60$	(sides)	
Ultimate Sliding Friction:	$f_s = 0 \cdot psf$	(base)	$f_{s.s} = 0.0000 \cdot psf$	(sides)	
Depth Neglected:	$D_n = 2.5\,ft$				
Depth of Water Table:	D_w = "Below Footing"				
Seismic Design Category:	SDCT = "Seismic Design Category B"	$Note_{SDC}$ = "N/A"			

MATERIAL SPECIFICATIONS

Concrete:	Compressive Strength:	$f'_c = 3000 \cdot psi$
	Clear Cover:	$cc = 3.0 \cdot in$
	Lightweight Aggregate Factor:	$\lambda = 1.00$
	Unit Weight:	$\gamma_{conc} = 150 \cdot pcf$
Rebar:	Yield Strength:	$F_y = 60 \cdot ksi$

LATERAL CAPACITY

Design Resist.	Lat. Load	Check	Ratio
$\min(\phi V_n) = 1112 \cdot kip$	$\max(V_u) = 22 \cdot kip$	$Check'_{lateral}$ = "OK"	$Ratio'_{lateral} = 0.02$

OVERTURNING

Design Resist.	O.T. Moment	Check	Ratio
$\min(MR1, MR2) = 6760\,ft \cdot kip$	$\max(M_{u.ot}) = 1394 \cdot ft \cdot kip$	$Check'_{over}$ = "OK"	$Ratio'_{over} = 0.47$

SOIL BEARING

Design Bearing Capacity	Max. Bearing	Check	Ratio
$\phi B_c = 22500 \cdot psf$	$P_{pos} = 2640 \cdot psf$	$Check'_{comp}$ = "OK"	$Ratio'_{comp} = 0.12$

PAD REINFORCEMENT/STRENGTH

*Pad reinforcement is assumed

Number of Reinforcing Layers:	Mats = "Top & Bottom Mats"
Pad has Hoops or Ties?	Tie_p = "No"
Bar Quantity:	$n_p = 21$ (per layer per direction)
Bar Size:	$s_p = 6$
Bar Spacing (center to center):	$sp_{p.ctr} = 10.5 \cdot in$
Bar Spacing (clear):	$sp_{p.cl} = 9.7 \cdot in$
Total Weight (per mat):	$Wt_{tp} = 1104\,lbf$
Check of Reinforcing Spacing and Minimum Reinforcing:	$Check_{spp.cl}$ = "OK" $Check_{spp.cl2}$ = "OK" $Check_{minp}$ = "N/A"

REINFORCING FLEXURAL STRENGTH

Case	Design Strength	Calculated Max Moment	Check	Ratio
A	$\phi M_{nA} = 805 \cdot ft \cdot kip$	$\max(M_{u.TA}) = 85\,ft \cdot kip$	$Check'_{flex}$ = "OK"	$Ratio_{flex} = 0.53$
B	$\phi M_{nB} = 805 \cdot ft \cdot kip$	$\max(M_{u.TB}) = 426\,ft \cdot kip$		

(Case A = Bottom of Pad in Tension at Toe, Case B = Top of Pad in Tension at Heel)

PAD ONE-WAY SHEAR

Case	Design Strength	Calculated Max Shear	Check	Ratio
2	$\phi V_{n1} = 353 \cdot kip$	$\lvert\max(V_{umax.C1T}, V_{umin.C1T})\rvert = 186 \cdot kip$ $\lvert\max(V_{umax.C2T}, V_{umin.C2T})\rvert = 137 \cdot kip$	$Check'_{shear.1}$ = "OK"	$Ratio'_{shear.1} = 0.53$

(Case 1 = Hinging about Pad Edge Adjacent to Pier 1, Case 2 = Hinging about Pad Edge Adjacent to Piers 2/3.)

Shear Reinforcing Check: $Check'_{shrrnf}$ = "OK"

TWO-WAY PAD SHEAR

Design Strength	Calculated Max Shear	Check	Ratio
$\phi V_{n2} = 573 \cdot kip$	$\max(V_{u2}) = 130 \cdot kip$	$Check'_{shear.2}$ = "OK"	$Ratio'_{shear.2} = 0.23$

PIER REINFORCEMENT

Gross Area: $A_{pier} = 4.0 \cdot ft^2$

Design Pier Area Factor: $P_{Ag} = 50 \cdot \%$

Effective Gross Area: $A'_{pier} = 2.0 \cdot ft^2$

Check of Area Factor: $Check_{PAg} = \text{"OK"}$

LONGITUDINAL PIER REINFORCING

Bar Quantity: $n_c = 12$

Bar Size: $s_c = 6$

Hook Length: $hook_{ca} = 0.0 \cdot in$ (actual/0 for none)

Bend Dia: $bend_c = 4.5 \cdot in$ (inside)

Hook Length: $hook_c = 9.0 \cdot in$ (required per ACI 7.1.2)

Bar Weight: $Wt_{tc} = 133\ lbf$ (per pier)

Check of Hook Length: $Check_{hookc} = \text{"N/A"}$

TIES

Tie Size: $s_t = 4.0000$

Tie Weight: $Wt_{tc} = 133 \cdot lbf$ (per pier)

Check of Tie Size: $Check_{st} = \text{"OK"}$

Maximum Crosstie Spacing (hx): (0 for none) $h_x = 0.0 \cdot in$

$Note_{SDCt1} = \text{"N/A"}$

Tie Levels: (0 if none)	Qty. Spaces	Spacing	
	$qsp_{t1} = 7.0000$	$sp_{t1} = 8.0 \cdot in$	(top)
	$qsp_{t2} = 0.0000$	$sp_{t2} = 0.0 \cdot in$	(mid.)
	$qsp_{t3} = 0.0000$	$sp_{t3} = 0.0 \cdot in$	(bot.)

Tie Quantity: $n_t = 8$

Maximum Required Tie Spacing (top, mid., bot.): $sp_{t.max} = 12.0 \cdot in$

$Check_{tie} = \text{"OK"}$

$Note_{SDCt3} = \text{"N/A"}$

$Check_{sp.cl} = \text{"OK"}$

TIE SPLICE

Required Lap Splice Length: $Lap = 24.0000 \cdot in$

$Note_{SDCt2} = \text{"N/A"}$

MINIMUM LONGITUDINAL REINFORCEMENT

Pier Area of Steel: $A_{tc} = 5.3 \cdot in^2$ $Ratio_{min.c} = 1.8 \cdot \%$ (based on effective pier gross area)

Minimum Steel Area Required: $A_{min.c} = 2.9 \cdot in^2$

Maximum Steel Area Allowed: $A_{max.c} = 23.0 \cdot in^2$

Check of Steel Area: $Check_{min.c} = \text{"OK"}$

BASE PLATE BEARING ON CONCRETE

Design Strength	Calculated Max Compression	Check	Ratio
$\phi B_n = 0 \cdot kip$	$\max(Pmax_u) = 72 \cdot kip$	$Check'_{bear} = \text{"N/A"}$	$Ratio'_{bear} = 0.00$

COMPRESSIVE STRENGTH OF PIER CONCRETE

Design Strength	Calculated Max Compression	Check	Ratio
$\phi P_n = 382 \cdot kip$	$\max(P_{upier}) = 76 \cdot kip$	$Check'_{comp2} = "OK"$	$Ratio'_{comp2} = 0.20$

SHEAR STRENGTH OF PIER CONCRETE

Design Strength	Calculated Max Shear	Check	Ratio
$\phi V_{npM} = 70 \cdot kip$	$\max(S_u) = 13 \cdot kip$	$Check'_{shear.p} = "OK"$	$Ratio'_{shear.p} = 0.19$

Shear Reinforcing Check: $Check'_{shrmfp} = "OK"$

PIER MOMENT CAPACITY

Design Strength	Calculated Max Moment	Check	Ratio
$\phi Mn_{cm} = 109 \, ft \cdot kip$	$\max(M_{u1.c}, M_{u2.c}) = 63 \, ft \cdot kip$	$Check'_{pier} = "OK"$	$Ratio'_{pier} = 0.58$

DEVELOPMENT LENGTH IN TENSION

Case	Required Length	Length Available	Check	Ratio
w/o Hook	$l_{dc} = 12.0 \cdot in$	$l_{ac} = 21.0 \cdot in$	$Check_{dev.ch} = "Hook not Required"$	$Ratio_{dev} = 0.57$
w/ Hook	$l_{dch} = 6.0 \cdot in$	$hook_{ca} = 0.0 \cdot in$		

Controlling Foundation: $CFP = 57.7 \cdot \%$

APPENDIX B

Data Provided for Analysis

SRR Towers Collocation Application

Installation Type: Anchor ☐ Collocation ☑ Add to Existing ☐

Contact: James Burgess
Email: jamesb@blueskytower.com
Office: 617-549-2800
Fax:

Site Number:
Site Name:
Submittal Date
Revision Date(s)

PLEASE SUBMIT THIS APPLICATION VIA E-MAIL. Include Drawings, Specification Sheets, RFDS, Antenna Data Sheets

Applicant Information

Applicant Name:	Cellco Partnership d/b/a Verizon Wireless	Primary Contact/Agent Name:	Phil Cotto
Applicant Site Name:	PORTLAND	Contact/Agent Company Name:	Structure Consulting Group
Applicant Site Number:	469381	Contact/Agent Number:	617-454-7363
Proposed ON AIR Date:	9/30/2022	Contact Email:	Pcotto@structureconsulting.net

Applicant Contact Information

Leasing Contact Name:	Phil Cotto	Email:	Pcotto@structureconsulting.net	Number:	
RF Contact Name:		Email:		Number:	
Construction Contact Name:		Email:		Number:	
Emergency Contact Name:		Email:		Number:	
Account Payable Contact Name:		Email:		Number:	

Tower Information

Latitude: N
Longitude: W
AMSL: FT
Site Address:

Structure Type:
Structure Height:

EQUIPMENT SPECIFICATIONS

Summary of Work to be Completed: New 3 sector installation of 9 panels and 9 RRUs. Tower extension to be performed to allow for VZW to take 90' CL.

EXISTING CONDITIONS - List all installed equipment prior to proposed modification. If this is a new installation, proceed to FINAL CONFIGURATION.

	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4 (if necessary)
Current RAD Center (Ft AGL)				
Tower Mount Height (If different than RAD ctr)				
Mount Type (Label "Existing" if no change)				
Mount Model #				
Antenna Manufacturer				
Antenna Model# (Attach Specs)				
Antenna Dimensions (WxHxD in inches)				
Antenna Weight (Lbs.)				
Antenna Quantity				
Dish Manufacturer				
Dish Model# (attach Specs)				
Dish Diameter (Ft)				
Dish Weight (Lbs.)				
Dish Mount Height				
Azimuths				
Total # of Coax Lines per Sector				
Diameter Of Coax Cables (In)				
Total # of Hybrid Cables per Sector				
Diameter Of Hybrid Cables (In)				
Total # of other Cables per Sector				
Diameter Of Other Cables (In)				
Quantity of RRUs per Sector				
Manufacturer				
Model				
Dimensions				
Weight (Lbs.)				
Quantity of TMAs per Sector				
Manufacturer				
Model				
Dimensions				
Weight (Lbs.)				
Quantity of Surge Arrestors per Sector				
Manufacturer				
Model				
Antenna Model & Quantity to be Removed per Sector (If Applicable)				
RRU Model & Quantity to be Removed per Sector (If Applicable)				
Line/Cable Type, Size & Quantity to be Removed (If Applicable)				
List Any Other Equipment to be Removed (If Applicable)				

FINAL CONFIGURATION - List all installed equipment after proposed modification or initial installation.

	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4 (if necessary)
Current/Proposed RAD Center (Ft AGL)	90	90	90	
Tower Mount Height (If different than RAD ctr)	80	80	80	
Mount Type (Label "Existing" if no change)	T-Arm	T-Arm	T-Arm	
Mount Model #	TBD	TBD	TBD	
Antenna Manufacturer	Commscope	Samsung	Samsung	
Antenna Model# (Attach Specs)	NNH4-65B-R6	RT4423	MT6413-77A	
Antenna Dimensions (WxHxD in inches)	19.60 x 55.11 x 7.76	11.8 x 8.7 x 4.2	28.91 x 15.75 x 5.51	
Antenna Weight (Lbs.)	73.86	18.7	57.32	
Antenna Quantity	3	3	3	
Dish Manufacturer				
Dish Model# (attach Specs)				
Dish Diameter (Ft)				
Dish Weight (Lbs.)				
Dish Mount Height				
Azimuths				

Total # of Coax Lines per Sector	0			
Diameter Of Coax Cables (in)				
Total # of Hybrid Cables per Sector	2			
Diameter Of Hybrid Cables (in)	6x12 hybriflex			
Total # of other Cables per Sector	1			
Diameter Of Other Cables (in)				
Quantity of RRUs per Sector	3	3	3	
Manufacturer	Samsung	Samsung	Samsung	
Model	RF4423-48B	RF4439d-25A	RF4461d-13A	
Quantity of TMAs per Sector	1			
Manufacturer	Commscope			
Model	FE-16148-OVP-B12			
Quantity of Surge Arrestors per Sector				
Manufacturer				
Model				
Transmit Frequency (MHz)	5, 2145-2155, 869-880, 890-891.5 M			
Receive Frequency (MHz)	95, 1745-1755, 824-835,845-846.5 MI			
Antenna Gain (Db)				
Type of Technology				
TX Power Output				
ERP (Watts)				
Electric Service Required (Amps/Volts)				

GROUND SPACE REQUIREMENTS

Existing Lease Area:	DIMS: L(ft)		W(ft)		OR		Square footage
New/Add 'l Lease Area being requested:	DIMS: L(ft)	20	W(ft)	10	OR		Square footage
Shelter:	DIMS: L(ft)		W(ft)		H(ft)		
Concrete Pad for Shelter/Cabinets:	DIMS: L(ft)		W(ft)				

POWER REQUIREMENTS

Power Provided by: _____ Electrical Service Provider: _____ Electrical Service Telephone Number: _____

Average Monthly Power Consumption: _____ KWH units

Is a multi-tenant meter rack present: Yes How many, if any, empty meter banks are present: _____

Telco/Interconnect Requirements: POTS ☐ T1 ☐ MICROWAVE ☐ FIBER OPTICS ☑

Fiber Provider: _____

BACK-UP POWER INFORMATION

Generator Required: No Generation Location: _____

Generator Ground Space Requirement: DIMS: L(ft) _____ W(ft) _____ H(ft) _____ **Fuel Type:** _____

BST Generator: _____ Generator Owner: _____ Shared Generator Peak Usage: _____ KW

Generator Capacity: _____ KW Generator Make: _____ Generator Model: _____

Fuel Tank Location: _____ Fuel Tank Size: DIMS: L(f _____ W(ft) _____ Fuel Tank S _____ Gallons

Pad for Fuel Tank (if required) DIMS: L(ft _____ W(ft) _____

Comments: _____

Comments: List any pertinent information that was not included above.

verizon
NPP RFDS

NORTHEAST > North East > New England > Wallingford-1 > PORTLAND HS CT - B

Cheiban, Ziad - ziad.cheiban@verizonwireless.com - 20230927_153155

Project Details	
Carrier Aggregation	N
Ecip	N
Project Name	PORTLAND HS CT
Project Alt Name	PORTLAND HS CT
Project Id	16599668
Designed Sector Carrier 4G	15
Designed Sector Carrier 5G	3
Additional Sector Carrier 4G	0
Additional Sector Carrier 5G	0
Suffix	Rev4-2023-09-27
FP Solution Type & Tech Type	MCR;4G_700;4G_850;4G_AWS;4G_CBRS;5G_L-Sub6;4G_PCS

Location Information	
Site Id	616480547
Search Ring#	
E-NodeB ID#	null
PSLC#	469381
Switch Name	Wallingford-1
Tower Type	
Site Type	MACRO
Street Address	97 High Street
City	Portland
State	CT
Zip Code	06480
County	Middlesex
Latitude	41.58071/ 41° 34' 50.556"
Longitude	-72.63136/ 72° 37' 52.896"

Project Scope
Rev4-2023-09-27 Use RF4461d-13A low band RRH and 6413 C-Band MMU

Antenna Summary

Added Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
					5G	Samsung	MT6413-77A	90	91.2	30(1),150(2),270(3)	PHYSICAL	3
LTE	LTE	LTE	LTE			COMMSCOPE	NNH4-65B-R6	90	93	30(1),150(2),270(3)	PHYSICAL	3
				LTE		Samsung	RT4423	90	90.4	30(19),150(20),270(21)	PHYSICAL	3

Removed Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Retained Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Added: 9	Removed: 0	Retained: 0

Non Antenna Summary

Added Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity
Hybrid Cable	Tower						Hybrid Cables	1-1/4" Hybrid Cables	PHYSICAL	2
OVP	Tower							12 OVP	PHYSICAL	1
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH ORAN (RF4439d-25A)	PHYSICAL	3
RRU	Tower					LTE	Samsung	RF4423-48B	PHYSICAL	3
RRU	Tower	LTE	LTE				Samsung	RF4461d-13A	PHYSICAL	3

Removed Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Retained Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Added: 12	Removed: 0	Retained: 0

Services		
700 LTE		**0002 (8118082)**

Sector	01	02	03
Azimuth	30	150	270
Cell/Enodeb-Id	064040	064040	064040
Antenna Model	NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline	90	90	90
DLEARFCN	5230	5230	5230
Mech Down-tilt	0	0	0
Elect Down-tilt	2	2	2
Tip Height	93	93	93
Regulatory Power	66.49 (W/MHz) ERP	66.49 (W/MHz) ERP	66.49 (W/MHz) ERP
Cell Max Power	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx	4 , 4	4 , 4	4 , 4
Position			
Transmitter Id	11232662	11232663	11232664
Source	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10
Ant. Dimensions H x W x D(inch)	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)	81.82	81.82	81.82

Services				
850 LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		2450	2450	2450
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298595	11298596	11298597
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services				
1900 LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		1050	1050	1050
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298592	11298593	11298594
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services				
AWS LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		2050	2050	2050
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298467	11298468	11298469
Source		VZNPP	VZNPP	VZNPP
Bandwidth		20	20	20
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services				
CBRS LTE		**0002 (8118082)**		
Sector		19	20	21
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		RT4423	RT4423	RT4423
Antenna Make		Samsung	Samsung	Samsung
Centerline		90	90	90
DLEARFCN		55343, 55541, 55739, 55937	55343, 55541, 55739, 55937	55343, 55541, 55739, 55937
Mech Down-tilt		0	0	0
Elect Down-tilt		7	7	7
Tip Height		90.4	90.4	90.4
Regulatory Power		3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)
Cell Max Power		37.02 dBm	37.02 dBm	37.02 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4423-48B	RF4423-48B	RF4423-48B
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298781	11298782	11298783
Source		VZNPP	VZNPP	VZNPP
Bandwidth		20, 20, 20, 20	20, 20, 20, 20	20, 20, 20, 20
Ant. Dimensions H x W x D(inch)		8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5
Weight(lb)		3.3	3.3	3.3

Services		
CBAND NR		**0002 (8118082)**

Sector	0001	0002	0003
Azimuth	30	150	270
Cell/Enodeb-Id	0640040	0640040	0640040
Antenna Model	MT6413-77A	MT6413-77A	MT6413-77A
Antenna Make	Samsung	Samsung	Samsung
Centerline	90	90	90
DLEARFCN	650006, 655324	650006, 655324	650006, 655324
Mech Down-tilt	0	0	0
Elect Down-tilt	1	1	1
Tip Height	91.2	91.2	91.2
Regulatory Power	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP
Cell Max Power	52.02 dBm	52.02 dBm	52.02 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	MT6413-77A	MT6413-77A	MT6413-77A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2
Position			
Transmitter Id	11298702	11298703	11298704
Source	VZNPP	VZNPP	VZNPP
Bandwidth	100, 60	100, 60	100, 60
Ant. Dimensions H x W x D(inch)	29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51
Weight(lb)	55.1	55.1	55.1

Callsigns Per Antenna

Sector	Make	Model	Ant CL Height AG	Ant Tip Height	Azimuth	Elect Down-tilt	Mech Down-tilt	Gain	Bandwidth	Regulator y Power	700	850	1900	2100	28 GHz	31 GHz	39 GHz	LSub-6	CBRS
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE581,WR NE582,WRNE 583,WRNE58 4,WRNE585	
19	Samsung	RT4423	90	90.4	30	7	0	10.34	67	3.76									CBRS_CALLS IGN
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	11.94	69.75	66.49	WQJQ689								
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	12.54	65	301.17		KNKA404							
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE581,WR NE582,WRNE 583,WRNE58 4,WRNE585	
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE585,WR NE586,WRNE 587,WRNE58	
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE581,WR NE582,WRNE 583,WRNE58 4,WRNE585	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	12.54	65	301.17		KNKA404							
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	12.54	65	301.17		KNKA404							
21	Samsung	RT4423	90	90.4	270	7	0	10.34	67	3.76									CBRS_CALLS IGN
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE585,WR NE586,WRNE 587,WRNE58	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.92	60.75	168.95			KNLH251,WP OJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.92	60.75	168.95			KNLH251,WP OJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	11.94	69.75	66.49	WQJQ689								
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	11.94	69.75	66.49	WQJQ689								
20	Samsung	RT4423	90	90.4	150	7	0	10.34	67	3.76									CBRS_CALLS IGN
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE585,WR NE586,WRNE 587,WRNE58	
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.92	60.75	168.95			KNLH251,WP OJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.93	63.5	84.67				WQGA906,WQ GB276					
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.93	63.5	84.67				WQGA906,WQ GB276					
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.93	63.5	84.67				WQGA906,WQ GB276					

Callsigns

Callsign	Market	Radio Code	Market #	Block	State	County	License Name	Wholly Owner	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq. mil	Status	Action	Approve for Inservc
WQJQ689	Northeast	WU	REA001	C	CT	9007	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	66.49	1000	444.75	proposed	added	1
KNKA404	Hartford-New Britain-Bristol, CT	CL	CMA032	A	CT	9007	Cellco Partnership	Yes	25.000	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	301.17	400	444.75	proposed	added	1
WPOJ730	Hartford, CT	CW	BTA184	C	CT	9007	Cellco Partnership	Yes	10.000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	168.95	1640	444.75	proposed	added	1
KNLH251	Hartford, CT	CW	BTA184	F	CT	9007	Cellco Partnership	Yes	10.000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	168.95	1640	444.75	proposed	added	1
CBRS_CALL SIGN	UNLICENSE	3.5 GHz	UNLICENSE	UNLICENSE	CT	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	-/-	-/-	3.76		444.75	proposed	added	
WQGB276	Hartford-New Britain-Bristol, CT	AW	CMA032	A	CT	9007	Cellco Partnership	Yes	20.000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	84.67	1640	444.75	proposed	added	1
WRNE581	New York, NY	PM	PEA001	A1	CT	9007	Cellco Partnership	Yes	20.000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE582	New York, NY	PM	PEA001	A2	CT	9007	Cellco Partnership	Yes	20.000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE583	New York, NY	PM	PEA001	A3	CT	9007	Cellco Partnership	Yes	20.000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE584	New York, NY	PM	PEA001	A4	CT	9007	Cellco Partnership	Yes	20.000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE585	New York, NY	PM	PEA001	A5	CT	9007	Cellco Partnership	Yes	20.000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	9007	Cellco Partnership	Yes	20.000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	84.67	1640	444.75	proposed	added	1

WRNE586	New York, NY	PM	PEA001	B1	CT	9007	Cellco Partnersh ip	Yes	20.000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE587	New York, NY	PM	PEA001	B2	CT	9007	Cellco Partnersh ip	Yes	20.000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE588	New York, NY	PM	PEA001	B3	CT	9007	Cellco Partnersh ip	Yes	20.000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1

CENTEK engineering

Centered on Solutions℠

Antenna Mount Analysis Report

Site Ref: Portland HS

97 High Street
Portland, CT

Centek Project No. 22017.06

~~Date: May 11, 2023~~
Rev 1: November 9, 2023

Max Stress Ratio = 44%

Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

CENTEK Engineering, Inc.
Mount Analysis
Verizon Site Ref. ~ Portand HS
Portland, CT
Rev 1 ~ November 9, 2023

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CENTEK engineering

Centered on Solutions℠

November 9, 2023

Mr. Phillip Cotto
Structure Consulting Group
49 Brattle Street
Arlington, Ma

Re: Structural Letter ~ Antenna Mount
Verizon – Site Ref: Portland HS
97 High Street
Portland, CT

Centek Project No. 22017.06

Dear Mr. Cotto,

Centek Engineering, Inc. has reviewed the Verizon antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the **proposed mount, consisting of three (3) V-frame sector mounts (SitePro P/N: VFA12-HD)** to support the proposed equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"*.

The loads considered in this analysis consist of the following:

- **Verizon:**
  V-Frames: Three (3) Commscope NNH4-65B-R6 panel antennas, three (3) Samsung MT6413-77A panel antennas, three (3) Samsung RT4423 panel antennas, three (3) Samsung RF4439d-25A (B2/B66A) RRHs, three (3) Samsung RF4461d-13A (B5/B13) RRHs, three (3) Samsung RF4423-48B RRHs and one (1) OVP Box mounted on three (3) V-Frames with a RAD center elevation of 90 ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 120 mph for Portland as required in Appendix P of the 2022 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

CENTEK Engineering, Inc.
Mount Analysis
Verizon Site Ref. ~ Portand HS
Portland, CT
Rev 1 ~ November 9, 2023

Section 2 - Calculations

CENTEK engineering
Centered on Solutions
63-2 North Branford Road
Branford, CT 06405
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P: (203) 488-0580
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Subject:	TIA-222-H Loads
Location:	Portland, CT
Rev. 1: 11/9/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 120$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 90$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 90$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	Id := 56.00	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1.15$$ (Per Table 2-3 of TIA-222-H)

$$I_{Selsmic} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \\ 1.50 & \text{if } SC = 4 \end{cases} = 1.25$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.106$$

$$t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.271$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.238$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 43.16$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.493$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 2.697$

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope NNH4-65B-R6		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 71.969$	in	(User Input)
Appurtenance Width =	$W_{app} := 19.606$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 7.756$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 90$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 3.7$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.25$		

Wind Load (without Ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 9.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 715$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 3.9$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 283$	lbs

Wind Load (with Ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 11.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 145$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 5.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 67$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 9.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 45$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 3.9$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 18$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 1 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 6053$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 196$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 196$	lbs

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Subject:	TIA-222-H Loads
Location:	Portland, CT
Rev. 1: 11/9/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung MT6413-77A		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 28.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.75$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 5.51$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 60$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.8$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 221$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 77$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 48$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.8$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 21$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 14$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2508$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2124$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 69$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 69$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RT4423		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 12.3$	in	(User Input)
Appurtenance Width =	$W_{app} := 8.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 1.4$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 3$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 52$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 8$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 1.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 14$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 5$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 3$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 1$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 150$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 508$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 16$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 16$	lbs

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Rev. 1: 11/9/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4439-25A(B2,B66A)RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 15$	in	(User Input)
Appurtenance Width =	$W_{app} := 15$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 10$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 75$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without Ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 109$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 73$	lbs

Wind Load (with Ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 26$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 19$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 7$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2250$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1610$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 52$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 52$	lbs

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Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4461d-13A(B5B13) RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 14.96$	in	(User Input)
Appurtenance Width =	$W_{app} := 14.96$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 10.23$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 80$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 109$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 74$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 26$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.6$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 19$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 7$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2289$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1623$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot ld = 53$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 53$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4423-48B RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 11.8$	in	(User Input)
Appurtenance Width =	$W_{app} := 8.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 3.6$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 16$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without Ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 50$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 21$	lbs

Wind Load (with Ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 1.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 14$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.6$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 7$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 3$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 1$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 370$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 621$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 20$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 20$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	OVP Box		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 29.5$	in	(User Input)
Appurtenance Width =	$W_{app} := 16.5$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 12.6$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 32$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.8$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without Ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 236$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 180$	lbs

Wind Load (with Ice)

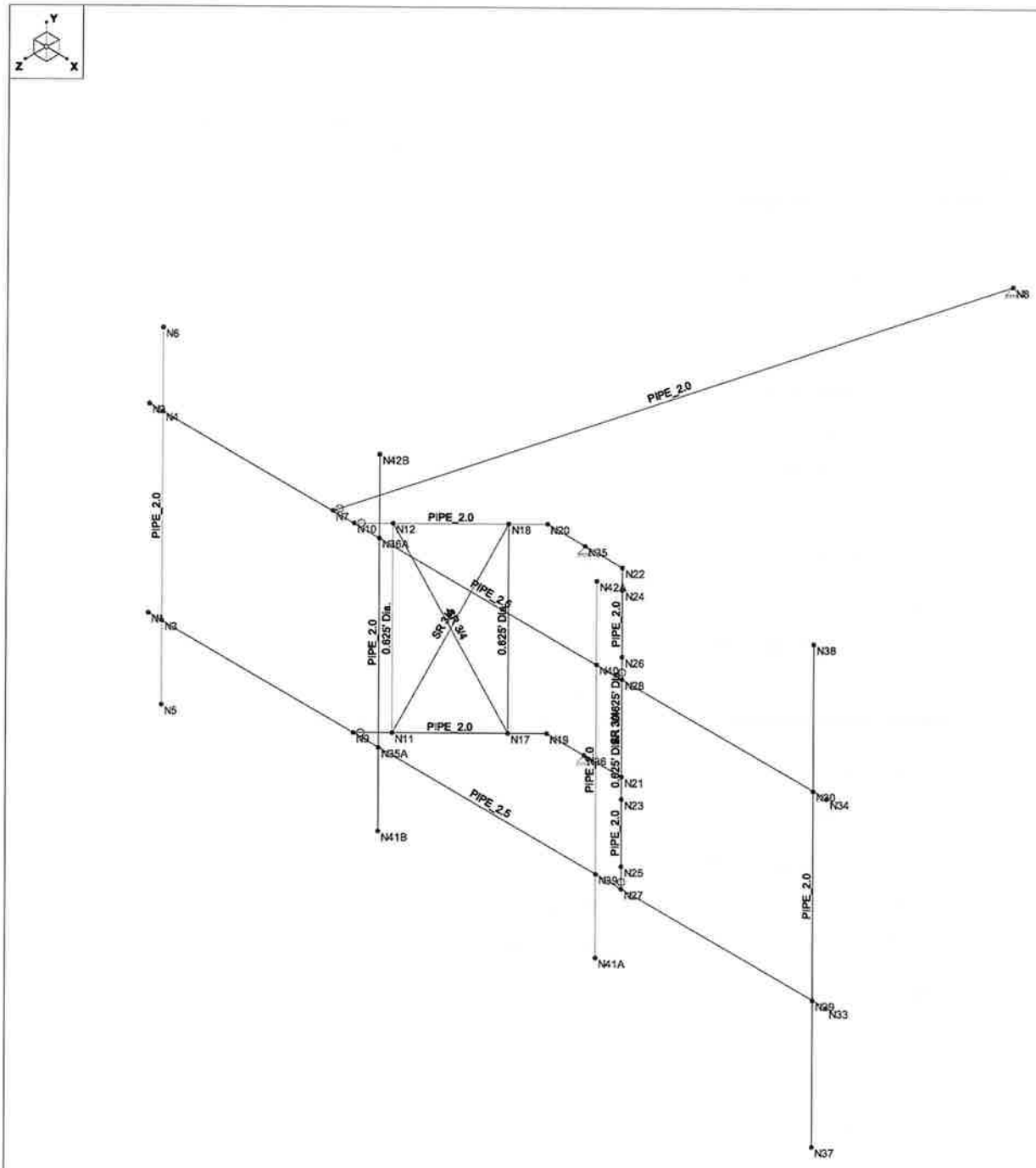
Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 4.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 51$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 41$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 15$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 11$	lbs

Gravity Loads (Ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 6133$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 3107$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 101$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 101$	lbs



Envelope Only Solution

Centek Engineering		
TJL	Portland HS	Nov 9, 2023 at 8:58 AM
22017.06	Member Framing	Mount.R3D

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast_2.0...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Horizontal_2.5 ST...	PIPE_2.5	Beam	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
3	Outrigger_2.0 ST...	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Stabilizer_2.0 ST...	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	0.625" Dia. Bar	0.625' Dia.	Column	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	0.75"Dia. Bar	SR 3/4	Column	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
2	M2	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
3	M3	Stabilizer_2.0 STD ...	10.18			Lbyy						Lateral
4	M4	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
5	M5	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
6	M6	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
7	M7	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
8	M8	0.625" Dia. Bar	3.333									Lateral
9	M9	0.625" Dia. Bar	3.333									Lateral
10	M10	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
11	M11	0.625" Dia. Bar	3.333									Lateral
12	M12	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
13	M13	0.625" Dia. Bar	3.333									Lateral
14	M14	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
15	M15	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
16	PS.2	Antenna Mast_2.0 ...	6			Lbyy						Lateral
17	PS.1	Antenna Mast_2.0 ...	8			Lbyy						Lateral
18	M19	Antenna Mast_2.0 ...	6			Lbyy						Lateral
19	M21A	Antenna Mast_2.0 ...	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N2	N34			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
2	M2	N1	N33			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
3	M3	N7	N8			Stabilizer_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
4	M4	N10	N20			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
5	M5	N9	N19			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
6	M6	N28	N22			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
7	M7	N27	N21			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
8	M8	N12	N11			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
9	M9	N18	N17			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
10	M10	N12	N17			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
11	M11	N26	N25			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
12	M12	N18	N11			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
13	M13	N24	N23			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
14	M14	N26	N23			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
15	M15	N24	N25			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
16	PS.2	N5	N6			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
17	PS.1	N37	N38			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
18	M19	N41A	N42A			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
19	M20	N19	N21			RIGID	None	None	RIGID	Typical
20	M21	N20	N22			RIGID	None	None	RIGID	Typical
21	M21A	N41B	N42B			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0.	-0.	0	
2	N2	0	3.333334	-0.	0	
3	N3	.25	0.	-0.	0	
4	N4	.25	3.333334	-0.	0	
5	N5	.25	-1.333333	-0.	0	
6	N6	.25	4.666667	-0.	0	
7	N7	3.390625	3.333334	-0.	0	
8	N8	6.025403	3.333334	-9.833125	0	
9	N9	3.78125	0.	-0.	0	
10	N10	3.78125	3.333334	-0.	0	
11	N11	4.138628	0.	-0.357378	0	
12	N12	4.138628	3.333334	-0.357378	0	
13	N17	5.206335	0.	-1.425085	0	
14	N18	5.206335	3.333334	-1.425085	0	
15	N19	5.563713	0.	-1.782463	0	
16	N20	5.563713	3.333334	-1.782463	0	
17	N21	6.936287	0.	-1.782463	0	
18	N22	6.936287	3.333334	-1.782463	0	
19	N23	7.293665	0.	-1.425085	0	
20	N24	7.293665	3.333334	-1.425085	0	
21	N25	8.361372	0.	-0.357378	0	
22	N26	8.361372	3.333334	-0.357378	0	
23	N27	8.71875	0.	-0.	0	
24	N28	8.71875	3.333334	-0.	0	
25	N29	12.25	0.	-0.	0	
26	N30	12.25	3.333334	-0.	0	
27	N33	12.5	0.	-0.	0	
28	N34	12.5	3.333334	-0.	0	
29	N35	6.25	3.333334	-1.782463	0	
30	N36	6.25	0.	-1.782463	0	
31	N35A	4.25	0.	-0.	0	
32	N36A	4.25	3.333334	-0.	0	
33	N37	12.25	-2.333333	0	0	
34	N38	12.25	5.666667	0	0	
35	N39	8.25	0.	-0.	0	
36	N40	8.25	3.333334	-0.	0	
37	N41A	8.25	-1.333333	-0.	0	
38	N42A	8.25	4.666667	-0.	0	
39	N41B	4.25	-1.333333	-0.	0	
40	N42B	4.25	4.666667	-0.	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N19						
3	N20						
4	N17						
5	N18						
6	N21						
7	N22						
8	N23						
9	N24						
10	N35	Reaction	Reaction	Reaction			
11	N36	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.045	1.5
2	PS.1	Y	-.045	6.5
3	PS.2	Y	-.03	2
4	PS.2	Y	-.03	4
5	PS.1	Y	-.075	3
6	PS.1	Y	-.08	5
7	M21A	Y	-.016	1
8	M19	Y	-.032	%50
9	M21A	Y	-.003	%50

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.098	1.5
2	PS.1	Y	-.098	6.5
3	PS.2	Y	-.035	2
4	PS.2	Y	-.035	4
5	PS.1	Y	-.052	3
6	PS.1	Y	-.053	5
7	M21A	Y	-.02	1
8	M19	Y	-.101	%50
9	M21A	Y	-.016	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.034	1.5
2	PS.1	X	.034	6.5
3	PS.2	X	.011	2
4	PS.2	X	.011	4
5	PS.1	X	.019	3
6	PS.1	X	.019	5
7	M21A	X	.007	1
8	M19	X	.041	%50
9	M21A	X	.005	%50

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.142	1.5
2	PS.1	X	.142	6.5
3	PS.2	X	.039	2
4	PS.2	X	.039	4
5	PS.1	X	.073	3
6	PS.1	X	.074	5
7	M21A	X	.021	1
8	M19	X	.18	%50
9	M21A	X	.008	%50

Member Point Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.009	1.5
2	PS.1	X	.009	6.5
3	PS.2	X	.003	2
4	PS.2	X	.003	4
5	PS.1	X	.005	3
6	PS.1	X	.005	5
7	M21A	X	.001	1
8	M19	X	.011	%50
9	M21A	X	.001	%50

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.073	1.5
2	PS.1	Z	.073	6.5
3	PS.2	Z	.024	2
4	PS.2	Z	.024	4
5	M19	Z	.051	%50
6	M21A	Z	.014	%50

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.358	1.5
2	PS.1	Z	.358	6.5
3	PS.2	Z	.111	2
4	PS.2	Z	.111	4
5	M19	Z	.236	%50
6	M21A	Z	.052	%50

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.023	1.5
2	PS.1	Z	.023	6.5
3	PS.2	Z	.007	2
4	PS.2	Z	.007	4
5	M19	Z	.015	%50
6	M21A	Z	.003	%50

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.003	.003	0	0
2	M4	X	.003	.003	0	0
3	M5	X	.003	.003	0	0
4	M6	X	.003	.003	0	0
5	M7	X	.003	.003	0	0
6	M8	X	.003	.003	0	0
7	M9	X	.003	.003	0	0
8	M10	X	.003	.003	0	0
9	M11	X	.003	.003	0	0
10	M12	X	.003	.003	0	0
11	M13	X	.003	.003	0	0
12	M14	X	.003	.003	0	0
13	M15	X	.003	.003	0	0
14	PS.2	X	.003	.003	0	0
15	PS.1	X	.003	.003	0	0
16	M19	X	.003	.003	0	0
17	M20	X	.003	.003	0	0
18	M21	X	.003	.003	0	0
19	M21A	X	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.018	.018	0	0
2	M4	X	.018	.018	0	0
3	M5	X	.018	.018	0	0
4	M6	X	.018	.018	0	0
5	M7	X	.018	.018	0	0
6	M8	X	.018	.018	0	0
7	M9	X	.018	.018	0	0
8	M10	X	.018	.018	0	0
9	M11	X	.018	.018	0	0
10	M12	X	.018	.018	0	0
11	M13	X	.018	.018	0	0
12	M14	X	.018	.018	0	0
13	M15	X	.018	.018	0	0
14	PS.2	X	.018	.018	0	0
15	PS.1	X	.018	.018	0	0
16	M19	X	.018	.018	0	0
17	M20	X	.018	.018	0	0
18	M21	X	.018	.018	0	0
19	M21A	X	.018	.018	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.003	.003	0	0
2	M4	X	.003	.003	0	0
3	M5	X	.003	.003	0	0
4	M6	X	.003	.003	0	0
5	M7	X	.003	.003	0	0
6	M8	X	.003	.003	0	0

Member Distributed Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
7	M9	X	.003	.003	0	0
8	M10	X	.003	.003	0	0
9	M11	X	.003	.003	0	0
10	M12	X	.003	.003	0	0
11	M13	X	.003	.003	0	0
12	M14	X	.003	.003	0	0
13	M15	X	.003	.003	0	0
14	PS.2	X	.003	.003	0	0
15	PS.1	X	.003	.003	0	0
16	M19	X	.003	.003	0	0
17	M20	X	.003	.003	0	0
18	M21	X	.003	.003	0	0
19	M21A	X	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.003	.003	0	0
2	M2	Z	.003	.003	0	0
3	M3	Z	.003	.003	0	0
4	M4	Z	.003	.003	0	0
5	M5	Z	.003	.003	0	0
6	M6	Z	.003	.003	0	0
7	M7	Z	.003	.003	0	0
8	M8	Z	.003	.003	0	0
9	M9	Z	.003	.003	0	0
10	M10	Z	.003	.003	0	0
11	M11	Z	.003	.003	0	0
12	M12	Z	.003	.003	0	0
13	M13	Z	.003	.003	0	0
14	M14	Z	.003	.003	0	0
15	M15	Z	.003	.003	0	0
16	PS.2	Z	.003	.003	0	0
17	M19	Z	.003	.003	0	0
18	M20	Z	.003	.003	0	0
19	M21	Z	.003	.003	0	0
20	M21A	Z	.003	.003	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.018	.018	0	0
2	M2	Z	.018	.018	0	0
3	M3	Z	.018	.018	0	0
4	M4	Z	.018	.018	0	0
5	M5	Z	.018	.018	0	0
6	M6	Z	.018	.018	0	0
7	M7	Z	.018	.018	0	0
8	M8	Z	.018	.018	0	0
9	M9	Z	.018	.018	0	0
10	M10	Z	.018	.018	0	0
11	M11	Z	.018	.018	0	0
12	M12	Z	.018	.018	0	0

Member Distributed Loads (BLC 10 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
13	M13	Z	.018	.018	0	0
14	M14	Z	.018	.018	0	0
15	M15	Z	.018	.018	0	0
16	PS.2	Z	.018	.018	0	0
17	M19	Z	.018	.018	0	0
18	M20	Z	.018	.018	0	0
19	M21	Z	.018	.018	0	0
20	M21A	Z	.018	.018	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.003	.003	0	0
2	M2	Z	.003	.003	0	0
3	M3	Z	.003	.003	0	0
4	M4	Z	.003	.003	0	0
5	M5	Z	.003	.003	0	0
6	M6	Z	.003	.003	0	0
7	M7	Z	.003	.003	0	0
8	M8	Z	.003	.003	0	0
9	M9	Z	.003	.003	0	0
10	M10	Z	.003	.003	0	0
11	M11	Z	.003	.003	0	0
12	M12	Z	.003	.003	0	0
13	M13	Z	.003	.003	0	0
14	M14	Z	.003	.003	0	0
15	M15	Z	.003	.003	0	0
16	PS.2	Z	.003	.003	0	0
17	M19	Z	.003	.003	0	0
18	M20	Z	.003	.003	0	0
19	M21	Z	.003	.003	0	0
20	M21A	Z	.003	.003	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					9			
3	Ice Load	None					9			
4	Lm Maintenance Load (500lb)	None								
5	Lv Maintenance Load (250lb)	None								
6	Wind with Ice X	None					9	19		
7	Wind X	None					9	19		
8	Wm Wind X	None					9	19		
9	Wind with Ice Z	None					6	20		
10	Wind Z	None					6	20		
11	Wm Wind Z	None					6	20		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
1	1.4D	Yes	Y		1	1.4	2	1.4																
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5														
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1														
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
5	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1												
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1														
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1												
8	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	.233	3	.025	1	.919	6	0	8	0	8	0	8
2		min	-.271	6	.021	3	-1.212	3	0	1	0	1	0	1
3	N35	max	-.133	6	.687	7	.804	3	0	8	0	8	0	8
4		min	-1.769	3	.384	3	-2.878	6	0	1	0	1	0	1
5	N36	max	.86	7	.658	4	.68	4	0	8	0	8	0	8
6		min	-.568	3	.247	6	-.958	6	0	1	0	1	0	1
7	Totals:	max	0	8	1.335	4	0	3						
8		min	-2.104	3	.827	8	-2.918	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	.063	3	.035	6	.3	6	3.976e-03	6	1.2e-02	6	9.437e-04	3
2		min	-.115	6	-.031	3	-.035	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
3	N2	max	.036	3	.035	6	.452	6	2.539e-03	6	1.23e-02	6	1.072e-03	3
4		min	-.045	6	-.032	3	-.009	4	-2.295e-03	3	-3.806e-04	4	-9.84e-04	6
5	N3	max	.063	3	.032	7	.264	6	3.976e-03	6	1.2e-02	6	9.436e-04	3
6		min	-.115	6	-.028	3	-.034	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
7	N4	max	.036	3	.032	7	.415	6	2.539e-03	6	1.23e-02	6	1.072e-03	3
8		min	-.045	6	-.028	3	-.008	4	-2.295e-03	3	-3.806e-04	4	-9.84e-04	6
9	N5	max	.079	3	.032	7	.201	6	3.906e-03	6	1.2e-02	6	1.014e-03	3
10		min	-.13	6	-.028	3	-.045	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
11	N6	max	.02	3	.032	7	.456	6	2.609e-03	6	1.23e-02	6	1.002e-03	3
12		min	-.029	6	-.028	3	-.041	3	-2.295e-03	3	-3.806e-04	4	-9.841e-04	6
13	N7	max	.036	3	.034	7	.016	3	1.447e-03	6	9.639e-03	6	6.175e-04	3
14		min	-.045	6	.011	3	-.018	6	-1.158e-03	3	-1.301e-03	3	-2.923e-04	6
15	N8	max	0	8	0	8	0	8	1.91e-03	1	7.888e-03	3	1.312e-03	3
16		min	0	1	0	1	0	1	1.435e-03	3	5.127e-05	2	-1.996e-04	6
17	N9	max	.062	3	.033	7	.082	3	2.235e-03	6	5.246e-03	6	3.777e-04	3
18		min	-.115	6	.013	3	-.152	6	-8.113e-04	3	-4.928e-04	1	-4.431e-04	6
19	N10	max	.036	3	.033	7	.023	3	1.311e-03	6	8.501e-03	6	3.855e-04	3
20		min	-.045	6	.013	3	-.061	6	-1.017e-03	3	-1.196e-03	3	-4.005e-04	7
21	N11	max	.05	3	.037	7	.069	3	2.019e-03	6	2.987e-03	3	1.281e-04	3
22		min	-.09	6	.013	3	-.127	6	-5.166e-04	3	-5.778e-03	6	-8.88e-04	6
23	N12	max	.024	3	.037	7	.012	3	1.391e-03	6	2.666e-03	3	4.435e-04	3
24		min	-.036	6	.013	3	-.053	6	-7.218e-04	3	-2.003e-03	6	-5.474e-04	7
25	N17	max	.011	3	.036	7	.031	3	1.191e-03	6	2.786e-03	3	-4.683e-04	3
26		min	-.02	6	.004	3	-.058	6	1.051e-04	3	-4.897e-03	6	-2.42e-03	7

Envelope Joint Displacements (Continued)

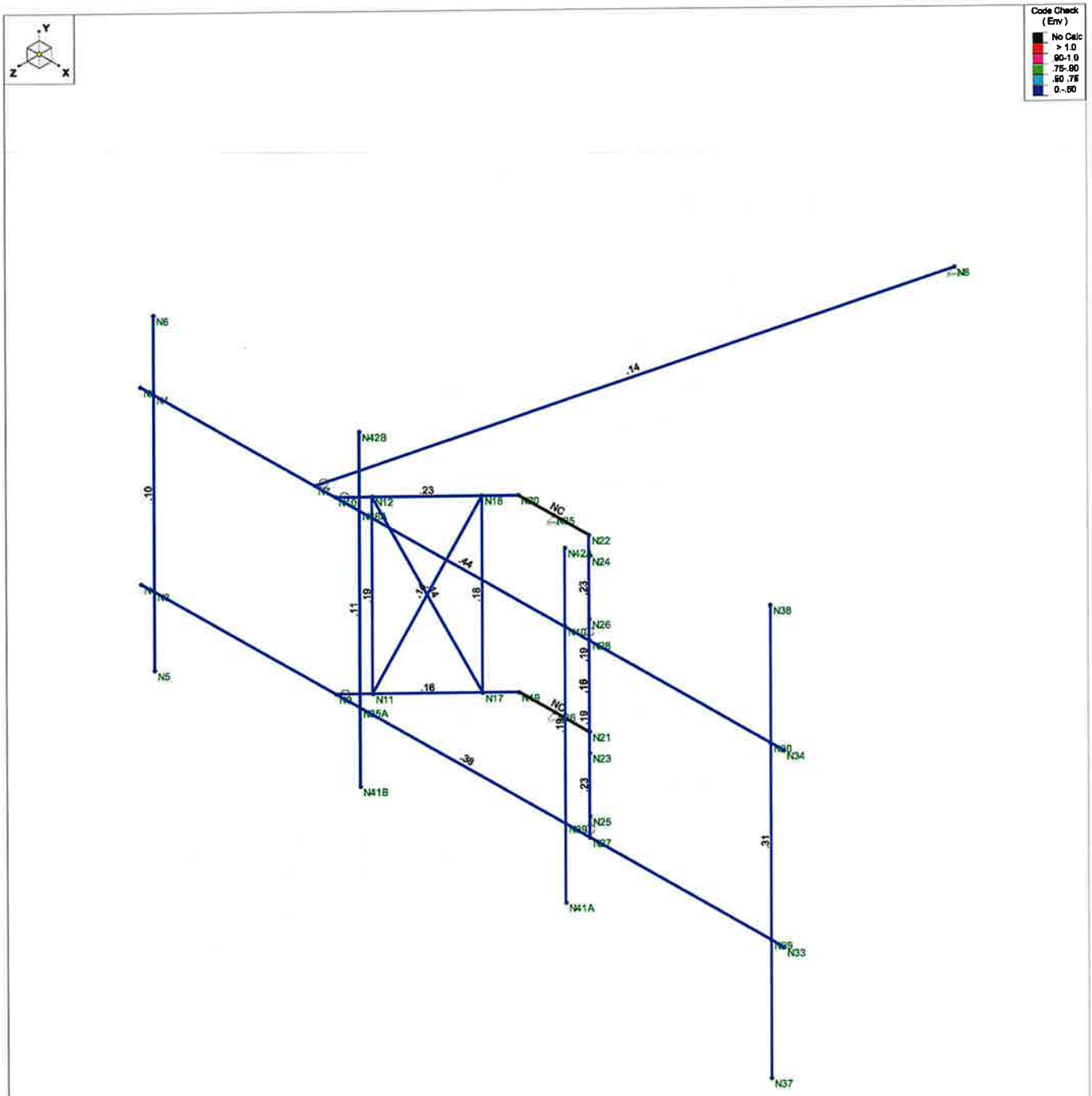
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
27	N18	max	0	3	.036	7	-.005	2	1.01e-03	7	4.415e-04	3	-2.46e-04	3
28		min	-.01	6	.004	3	-.029	6	-5.278e-05	3	-2.066e-03	6	-2.361e-03	7
29	N19	max	0	8	.027	7	.02	3	6.829e-04	7	2.43e-03	3	-4.687e-04	3
30		min	0	1	.004	3	-.038	6	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
31	N20	max	0	8	.027	7	-.004	2	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
32		min	0	1	.004	3	-.02	6	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
33	N21	max	0	8	-.004	3	.038	6	6.829e-04	7	2.43e-03	3	-4.687e-04	3
34		min	0	1	-.027	7	-.02	3	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
35	N22	max	0	8	-.004	3	.02	6	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
36		min	0	1	-.027	7	.004	2	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
37	N23	max	.011	3	-.008	3	.059	6	2.79e-04	3	2.787e-03	3	-6.364e-04	3
38		min	-.021	6	-.042	7	-.031	3	-3.293e-04	6	-5.187e-03	6	-2.611e-03	7
39	N24	max	-.001	3	-.008	3	.03	6	5.174e-04	3	5.077e-04	3	-3.814e-04	3
40		min	-.01	6	-.042	7	.005	2	-5.375e-04	6	-2.405e-03	6	-2.64e-03	7
41	N25	max	.049	3	-.019	3	.131	6	4.08e-04	3	3.007e-03	3	-1.206e-03	3
42		min	-.092	6	-.049	7	-.069	3	-1.606e-03	6	-5.675e-03	6	-2.55e-03	7
43	N26	max	.024	3	-.019	3	.06	6	5.829e-04	3	2.813e-03	3	-5.439e-04	3
44		min	-.038	6	-.049	7	-.014	3	-1.67e-03	6	-2.047e-03	6	-2.545e-03	7
45	N27	max	.062	3	-.028	3	.155	6	9.807e-04	3	3.068e-03	3	-1.82e-03	3
46		min	-.116	6	-.057	7	-.082	3	-1.518e-03	6	-1.661e-02	6	-3.895e-03	7
47	N28	max	.037	3	-.025	3	.069	6	1.105e-03	3	2.157e-03	3	-1.342e-03	3
48		min	-.046	6	-.057	7	-.027	3	-1.011e-03	6	-1.498e-02	6	-3.91e-03	7
49	N29	max	.062	3	-.12	3	1.127	6	1.489e-03	3	2.584e-03	3	-7.332e-04	3
50		min	-.116	6	-.296	7	-.198	3	-4.803e-03	6	-2.599e-02	6	-4.428e-03	7
51	N30	max	.037	3	-.12	3	1.022	6	1.555e-03	3	2.602e-03	3	-1.698e-03	3
52		min	-.046	6	-.296	7	-.131	3	-6.971e-04	7	-2.611e-02	6	-4.426e-03	7
53	N33	max	.062	3	-.122	3	1.205	6	1.489e-03	3	2.584e-03	3	-7.333e-04	3
54		min	-.116	6	-.31	7	-.206	3	-4.803e-03	6	-2.599e-02	6	-4.428e-03	7
55	N34	max	.037	3	-.125	3	1.1	6	1.555e-03	3	2.602e-03	3	-1.698e-03	3
56		min	-.046	6	-.31	7	-.139	3	-6.971e-04	7	-2.611e-02	6	-4.426e-03	7
57	N35	max	0	8	0	8	0	8	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
58		min	0	1	0	1	0	1	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
59	N36	max	0	8	0	8	0	8	6.829e-04	7	2.43e-03	3	-4.687e-04	3
60		min	0	1	0	1	0	1	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
61	N35A	max	.062	3	.03	4	.072	3	1.958e-03	6	3.444e-03	6	1.989e-04	3
62		min	-.115	6	.012	6	-.176	6	-7.375e-04	3	-5.307e-04	1	-7.034e-04	7
63	N36A	max	.036	3	.03	4	.028	3	1.14e-03	6	6.615e-03	6	1.487e-04	3
64		min	-.045	6	.012	6	-.104	6	-8.946e-04	3	-6.161e-04	3	-6.81e-04	7
65	N37	max	.062	3	-.12	3	1.292	6	1.488e-03	3	2.584e-03	3	1.322e-04	3
66		min	-.206	6	-.296	7	-.24	3	-6.029e-03	6	-2.599e-02	6	-4.418e-03	7
67	N38	max	.14	4	-.12	3	1.06	6	1.556e-03	3	2.602e-03	3	-2.2e-03	2
68		min	.043	6	-.296	7	-.087	3	-4.472e-04	7	-2.611e-02	6	-4.435e-03	7
69	N39	max	.062	3	-.018	6	.069	6	9.05e-04	3	3.152e-03	3	-1.268e-03	3
70		min	-.116	6	-.038	4	-.065	3	-1.203e-03	6	-1.414e-02	6	-2.813e-03	7
71	N40	max	.037	3	-.018	6	-.002	2	9.904e-04	3	2.038e-03	3	-7.735e-04	3
72		min	-.046	6	-.038	4	-.015	3	-1.206e-03	6	-1.214e-02	6	-2.824e-03	7
73	N41A	max	.043	3	-.018	6	.089	6	9.05e-04	3	3.152e-03	3	-1.198e-03	3
74		min	-.144	6	-.038	4	-.079	3	-1.273e-03	6	-1.414e-02	6	-2.813e-03	7
75	N42A	max	.061	4	-.018	6	.001	3	9.904e-04	3	2.038e-03	3	-8.439e-04	3
76		min	-.017	6	-.038	4	-.026	6	-1.135e-03	6	-1.214e-02	6	-2.824e-03	7
77	N41B	max	.067	3	.03	4	.084	3	1.887e-03	6	3.444e-03	6	2.808e-04	3
78		min	-.125	6	.012	6	-.207	6	-7.374e-04	3	-5.307e-04	1	-7.032e-04	7

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
79	N42B	max	.034	3	.03	4	.017	4	1.211e-03	6	6.615e-03	6	7.826e-05	3
80		min	-.036	6	.012	6	-.085	6	-8.947e-04	3	-6.161e-04	3	-6.81e-04	7

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

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M1	PIPE_2.5	.444	8....	6	.109	3.776		6 14.559	50.715	3.596	3.5...	2....	H1...
2	M2	PIPE_2.5	.383	8....	6	.094	8.724		6 14.559	50.715	3.596	3.5...	2....	H1...
3	M3	PIPE_2.0	.143	5....	3	.009	10.18		3 9.492	32.13	1.872	1.8...	1....	H1...
4	M4	PIPE_2.0	.228	2....	3	.084	2.521		3 32.032	32.13	1.872	1.8...	1....	H1...
5	M5	PIPE_2.0	.160	2....	7	.068	2.521		4 32.032	32.13	1.872	1.8...	1....	H1...
6	M6	PIPE_2.0	.231	2....	7	.086	.499		7 32.032	32.13	1.872	1.8...	1....	H1...
7	M7	PIPE_2.0	.226	2....	7	.091	.499		7 32.032	32.13	1.872	1.8...	1....	H1...
8	M8	0.625' Dia.	.190	3....	6	.024	3.333		6 1.058	9.94	.104	.104	2....	H1...
9	M9	0.625' Dia.	.177	0	3	.019	0		6 1.058	9.94	.104	.104	2....	H1...
10	M10	SR 3/4	.141	0	3	.020	0		6 6.954	14.314	.179	.179	1	H1...
11	M11	0.625' Dia.	.194	0	3	.023	0		6 1.058	9.94	.104	.104	2....	H1...
12	M12	SR 3/4	.144	0	3	.021	0		6 6.954	14.314	.179	.179	2....	H1...
13	M13	0.625' Dia.	.194	0	3	.019	0		6 1.058	9.94	.104	.104	2....	H1...
14	M14	SR 3/4	.158	0	3	.017	0		6 6.954	14.314	.179	.179	2....	H1...
15	M15	SR 3/4	.151	0	3	.018	0		6 6.954	14.314	.179	.179	1	H1...
16	PS.2	PIPE_2.0	.097	1....	6	.027	1.375		6 20.867	32.13	1.872	1.8...	1....	H1...
17	PS.1	PIPE_2.0	.311	5....	4	.039	5.667		6 14.916	32.13	1.872	1.8...	4....	H1...
18	M19	PIPE_2.0	.195	4....	3	.058	4.625		6 20.867	32.13	1.872	1.8...	1....	H1...
19	M21A	PIPE_2.0	.113	1....	6	.071	1.375		6 20.867	32.13	1.872	1.8...	1....	H1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering		
TJL	Portland HS	Nov 9, 2023 at 8:57 AM
22017.06	Unity Check	Mount.R3D

CENTEK engineering
Centered on Solutions™ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Connection to Host Structure

Location: Portland, CT

Rev. 0: 5/11/23

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 22017.06

Antenna Mount Connection:

Anchor Data:

A307 Threaded Rod =

Number of Anchor Bolts = $N := 4$ (User Input)

Diameter of Bolts = $D := 0.625in$ (User Input)

Design Tension = $T_{design} := 10.4 \cdot kips$ (User Input)

Design Shear = $V_{design} := 6.23 \cdot kips$ (User Input)

Design Reactions:

Fx = $F_x := 1.7 \cdot kips$ (User Input)

Fy = $F_y := 0.7 \cdot kips$ (User Input)

Fz = $F_z := 2.8 \cdot kips$ (User Input)

Anchor Check:

Max Tension Force = $T_{Max} := \frac{F_z}{N} = 700lb$

Max Shear Force = $V_{Max} := \frac{F_y}{N} + \frac{F_x}{N} = 600lb$

Condition 1 = $Condition1 := if\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, "OK", "NG"\right) = "OK"$

% of Capacity = $\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 16.4 \cdot \%$

verizon
NPP RFDS

NORTHEAST > North East > New England > Wallingford-1 > PORTLAND HS CT - B

Cheiban, Ziad - ziad.cheiban@verizonwireless.com - 20230927_153155

Project Details		Location Information	
Carrier Aggregation	N	Site Id	616480547
Ecip	N	Search Ring#	
Project Name	PORTLAND HS CT	E-NodeB ID#	null
Project Alt Name	PORTLAND HS CT	PSLC#	469381
Project Id	16599668	Switch Name	Wallingford-1
Designed Sector Carrier 4G	15	Tower Type	
Designed Sector Carrier 5G	3	Site Type	MACRO
Additional Sector Carrier 4G	0	Street Address	97 High Street
Additional Sector Carrier 5G	0	City	Portland
Suffix	Rev4-2023-09-27	State	CT
FP Solution Type & Tech Type	MCR;4G_700;4G_850;4G_AWS;4G_CBRS;5G_L-Sub6;4G_PCS	Zip Code	06480
		County	Middlesex
		Latitude	41.58071/ 41° 34' 50.556"
		Longitude	-72.63136/ 72° 37' 52.896"

Project Scope

Rev4-2023-09-27
Use RF4461d-13A low band RRH and 6413 C-Band MMU

Antenna Summary

Added Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
					5G	Samsung	MT6413-77A	90	91.2	30(1),150(2),270(3)	PHYSICAL	3
LTE	LTE	LTE	LTE			COMMSCOPE	NNH4-65B-R6	90	93	30(1),150(2),270(3)	PHYSICAL	3
				LTE		Samsung	RT4423	90	90.4	30(19),150(20),270(21)	PHYSICAL	3

Removed Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Retained Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Added: 9	Removed: 0	Retained: 0

Non Antenna Summary

Added Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity
Hybrid Cable	Tower						Hybrid Cables	1-1/4" Hybrid Cables	PHYSICAL	2
OVP	Tower							12 OVP	PHYSICAL	1
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH ORAN (RF4439d-25A)	PHYSICAL	3
RRU	Tower					LTE	Samsung	RF4423-48B	PHYSICAL	3
RRU	Tower	LTE	LTE				Samsung	RF4461d-13A	PHYSICAL	3

Removed Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Retained Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Added: 12	Removed: 0	Retained: 0

Services				
700 LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		5230	5230	5230
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		66.49 (W/MHz) ERP	66.49 (W/MHz) ERP	66.49 (W/MHz) ERP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11232662	11232663	11232664
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services		
850 LTE		**0002 (8118082)**

Sector	01	02	03
Azimuth	30	150	270
Cell/Enodeb-Id	064040	064040	064040
Antenna Model	NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline	90	90	90
DLEARFCN	2450	2450	2450
Mech Down-tilt	0	0	0
Elect Down-tilt	2	2	2
Tip Height	93	93	93
Regulatory Power	301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD
Cell Max Power	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx	4 , 4	4 , 4	4 , 4
Position			
Transmitter Id	11298595	11298596	11298597
Source	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10
Ant. Dimensions H x W x D(inch)	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)	81.82	81.82	81.82

Services			
1900 LTE		**0002 (8118082)**	
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		1050	1050	1050
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298592	11298593	11298594
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services		
AWS LTE		**0002 (8118082)**

Sector	01	02	03
Azimuth	30	150	270
Cell/Enodeb-Id	064040	064040	064040
Antenna Model	NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline	90	90	90
DLEARFCN	2050	2050	2050
Mech Down-tilt	0	0	0
Elect Down-tilt	2	2	2
Tip Height	93	93	93
Regulatory Power	84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP
Cell Max Power	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	4 , 4	4 , 4	4 , 4
Position			
Transmitter Id	11298467	11298468	11298469
Source	VZNPP	VZNPP	VZNPP
Bandwidth	20	20	20
Ant. Dimensions H x W x D(inch)	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)	81.82	81.82	81.82

Services				
CBRS LTE		**0002 (8118082)**		
Sector		19	20	21
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		RT4423	RT4423	RT4423
Antenna Make		Samsung	Samsung	Samsung
Centerline		90	90	90
DLEARFCN		55343, 55541, 55739, 55937	55343, 55541, 55739, 55937	55343, 55541, 55739, 55937
Mech Down-tilt		0	0	0
Elect Down-tilt		7	7	7
Tip Height		90.4	90.4	90.4
Regulatory Power		3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)
Cell Max Power		37.02 dBm	37.02 dBm	37.02 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4423-48B	RF4423-48B	RF4423-48B
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298781	11298782	11298783
Source		VZNPP	VZNPP	VZNPP
Bandwidth		20, 20, 20, 20	20, 20, 20, 20	20, 20, 20, 20
Ant. Dimensions H x W x D(inch)		8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5
Weight(lb)		3.3	3.3	3.3

Services		
CBAND NR		**0002 (8118082)**

Sector	0001	0002	0003
Azimuth	30	150	270
Cell/Enodeb-Id	0640040	0640040	0640040
Antenna Model	MT6413-77A	MT6413-77A	MT6413-77A
Antenna Make	Samsung	Samsung	Samsung
Centerline	90	90	90
DLEARFCN	650006, 655324	650006, 655324	650006, 655324
Mech Down-tilt	0	0	0
Elect Down-tilt	1	1	1
Tip Height	91.2	91.2	91.2
Regulatory Power	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP
Cell Max Power	52.02 dBm	52.02 dBm	52.02 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	MT6413-77A	MT6413-77A	MT6413-77A
Number of Tx,Rx	2 , 2	2 , 2	2 , 2
Position			
Transmitter Id	11298702	11298703	11298704
Source	VZNPP	VZNPP	VZNPP
Bandwidth	100, 60	100, 60	100, 60
Ant. Dimensions H x W x D(Inch)	29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51
Weight(lb)	55.1	55.1	55.1

Callsigns Per Antenna

Sector	Make	Model	Ant CL Height AG	Ant Tip Height	Azimuth	Elect Down-tilt	Mech Down-tilt	Gain	Bandwidth	Regulatory Power	700	850	1900	2100	28 GHz	31 GHz	39 GHz	LSub-6	CBRS
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
19	Samsung	RT4423	90	90.4	30	7	0	10.34	67	3.76									CBRS_CALLSIGN
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	11.94	69.75	66.49	WQJQ689								
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	12.54	65	301.17		KNKA404							
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	12.54	65	301.17		KNKA404							
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	12.54	65	301.17		KNKA404							
21	Samsung	RT4423	90	90.4	270	7	0	10.34	67	3.76									CBRS_CALLSIGN
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	11.94	69.75	66.49	WQJQ689								
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	11.94	69.75	66.49	WQJQ689								
20	Samsung	RT4423	90	90.4	150	7	0	10.34	67	3.76									CBRS_CALLSIGN
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.93	63.5	84.67				WQGA906,WGGB276					
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.93	63.5	84.67				WQGA906,WGGB276					
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.93	63.5	84.67				WQGA906,WGGB276					

Callsigns

Callsign	Market	Radio Code	Market #	Block	State	County	License Name	Wholly Owner	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq. mil	Status	Action	Approve for Insvc
WQJQ689	Northeast	WU	REA001	C	CT	9007	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	66.49	1000	444.75	proposed	added	1
KNKA404	Hartford-New Britain-Bristol, CT	CL	CMA032	A	CT	9007	Cellco Partnership	Yes	25.000	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	301.17	400	444.75	proposed	added	1
WPOJ730	Hartford, CT	CW	BTA184	C	CT	9007	Cellco Partnership	Yes	10.000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	168.95	1640	444.75	proposed	added	1
KNLH251	Hartford, CT	CW	BTA184	F	CT	9007	Cellco Partnership	Yes	10.000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	168.96	1640	444.75	proposed	added	1
CBRS_CALL SIGN	UNLICENSE	3.5 GHz	UNLICENSE	UNLICENSE	CT	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	- / -	- / -	3.76		444.75	proposed	added	
WQGB276	Hartford-New Britain-Bristol, CT	AW	CMA032	A	CT	9007	Cellco Partnership	Yes	20.000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	84.67	1640	444.75	proposed	added	1
WRNE581	New York, NY	PM	PEA001	A1	CT	9007	Cellco Partnership	Yes	20.000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE582	New York, NY	PM	PEA001	A2	CT	9007	Cellco Partnership	Yes	20.000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE583	New York, NY	PM	PEA001	A3	CT	9007	Cellco Partnership	Yes	20.000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE584	New York, NY	PM	PEA001	A4	CT	9007	Cellco Partnership	Yes	20.000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE585	New York, NY	PM	PEA001	A5	CT	9007	Cellco Partnership	Yes	20.000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	9007	Cellco Partnership	Yes	20.000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	84.67	1640	444.75	proposed	added	1

WRNE586	New York, NY	PM	PEA001	B1	CT	9007	Calico Partnership	Yes	20.000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE587	New York, NY	PM	PEA001	B2	CT	9007	Calico Partnership	Yes	20.000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE588	New York, NY	PM	PEA001	B3	CT	9007	Calico Partnership	Yes	20.000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1

verizon

SITE NAME: PORTLAND HS CT
SITE ID: 616480547
97 HIGH STREET
PORTLAND, CT 06480

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP

N.T.S.

VICINITY MAP

N.T.S.

SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH

SITE COORDINATES: LATITUDE: 41° 33' 43.34" N
LONGITUDE: 72° 49' 41.33" W
GROUND ELEVATION: ±502' AMSL.

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. INSTALL (3) PROPOSED COMMSCOPE NNH4-65B-R6 ANTENNAS
2. INSTALL (3) PROPOSED SAMSUNG MT8413-77A ANTENNAS WITH INTEGRATED RADIO
3. INSTALL (3) PROPOSED SAMSUNG RT4423 ANTENNAS WITH INTEGRATED RADIO (RF4423-48B)
4. INSTALL (3) PROPOSED SAMSUNG B2/B66A RRH ORAN (RF4439d-25A) RADIOS
5. INSTALL (3) PROPOSED SAMSUNG B5/B13 RRH ORAN (RF4461d-13A) RADIOS
6. INSTALL (1) PROPOSED RAYCAP OVP 12
7. INSTALL (3) SECTOR FRAME ANTENNA MOUNTS, TYP. (1) PER SECTOR
8. INSTALL CABLE ICE-BRIDGE
9. INSTALL NEW EQUIPMENT PAD, STEEL EQUIPMENT CANOPY AND ASSOCIATED CABINETS
10. INSTALL NEW SMART METER (PGSD)
11. INSTALL ILO CABINET
12. INSTALL TELCO CABINET
13. INSTALL UNISTRUT FRAME TO ACCOMMODATE EQUIPMENT INSTALLATION

PROJECT INFORMATION

SITE NAME:	PORTLAND HS CT
SITE ID:	616480547
SITE ADDRESS:	97 HIGH STREET PORTLAND, CT 06480
APPLICANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
CONTACT PERSON:	MICHAEL HUMPHREYS (CONSTRUCTION MANAGER) VERIZON WIRELESS (980) 360-8410
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-34'-50.63" LONGITUDE: 72°-37'-52.98" GROUND ELEVATION: 350'± A.M.S.L. COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH SOFTWARE.

SHEET INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	SPECIFICATIONS, NOTES, AND ANT. SCHEDULE	0
C-1	COMPOUND, EQUIPMENT PLAN & ELEVATION	0
C-2	ANTENNA CONFIGURATION PLAN, ELEVATION AND DETAIL	0
C-3	SITE AND MISCELLANEOUS DETAILS	0
C-4	TYPICAL CONDUIT PENETRATION DETAILS	0
C-5	EQUIPMENT ICE BRIDGE CANOPY PLAN AND DETAILS	0
C-6	RF DETAILS	0
E-1	ELECTRICAL CONDUIT ROUTING AND RISER DIAGRAM	0
E-2	ELECTRICAL SCHEMATIC DIAGRAM	0
E-3	ELECTRICAL GROUNDING PLANS	0
E-4	TYPICAL ELECTRICAL DETAILS	0
E-5	TYPICAL ELECTRICAL DETAILS	0
E-6	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	BY	DESCRIPTION
0	11/08/23	CBC	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	10/12/23	CBC	PRELIMINARY DRAWINGS - ISSUED FOR CLIENT REVIEW

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SITE ID: 616480547
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PORTLAND CT, 06480

DATE: 11/08/23
SCALE: AS NOTED
JOB NO. 23017.05

TITLE SHEET

T-1

Sheet No. 1 of 11

NOTES AND SPECIFICATIONS:

DESIGN BASIS:

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:
   - RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
   - NOMINAL DESIGN SPEED: 101 MPH (Vasd)
     (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-16).

SITE NOTES:

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2023 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES," 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND ENSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND "HIDDEN" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND BOND OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THIS WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

STRUCTURAL STEEL:

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   - A. STRUCTURAL STEEL (W SHAPES)-----ASTM A992 (FY = 50 KSI)
   - B. STRUCTURAL STEEL (OTHER SHAPES)-----ASTM A36 (FY = 36 KSI)
   - C. STRUCTURAL HSS (RECTANGULAR SHAPES)-----ASTM A500 GRADE B, (FY = 46 KSI)
   - D. STRUCTURAL HSS (ROUND SHAPES)-----ASTM A500 GRADE B, (FY = 42 KSI)
   - E. PIPE-----ASTM A53 (FY = 35 KSI)
   - F. CONNECTION BOLTS-----ASTM A325-N
   - G. U-BOLTS-----ASTM A36
   - H. ANCHOR RODS-----ASTM F 1554
   - I. WELDING ELECTRODE-----ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 90% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1/500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PREEXISTING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA (QTY)	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) CABLES (QTY)
A1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	30'	(P) SAMSUNG C26S RRH-RT4423-48B (1), (P) OVP 13 (1)	(P) 6x12 HYBRIFLEX (2)
A2	PROPOSED	COMMSCOPE: NHH-65B-R6	71.9 x 19.6 x 7.7	90'	30'	(P) SAMSUNG B5/B13 RRH QRAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH QRAN (RF4439d-25A) (1)	
A3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 8.5	90'	30'		
B1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	150'	(P) SAMSUNG C26S RRH-RT4423-48B (1)	
B2	PROPOSED	COMMSCOPE: NHH-65B-R6	71.9 x 19.6 x 7.7	90'	150'	(P) SAMSUNG B5/B13 RRH QRAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH QRAN (RF4439d-25A) (1)	
B3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 8.5	90'	150'		
C1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	270'	(P) SAMSUNG C26S RRH-RT4423-48B (1)	
C2	PROPOSED	COMMSCOPE: NHH-65B-R6	71.9 x 19.6 x 7.7	90'	270'	(P) SAMSUNG B5/B13 RRH QRAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH QRAN (RF4439d-25A) (1)	
C3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 8.5	90'	270'		

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	11/08/23	SM	LS	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
-	10/31/23	SM	LS	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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PORTLAND CT, 06480

DATE: 11/08/23
SCALE: AS NOTED
JOB NO. 23017.06

SPECIFICATIONS, NOTES AND ANT. SCHEDULE

N-1

Sheet No. 2 of 14

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

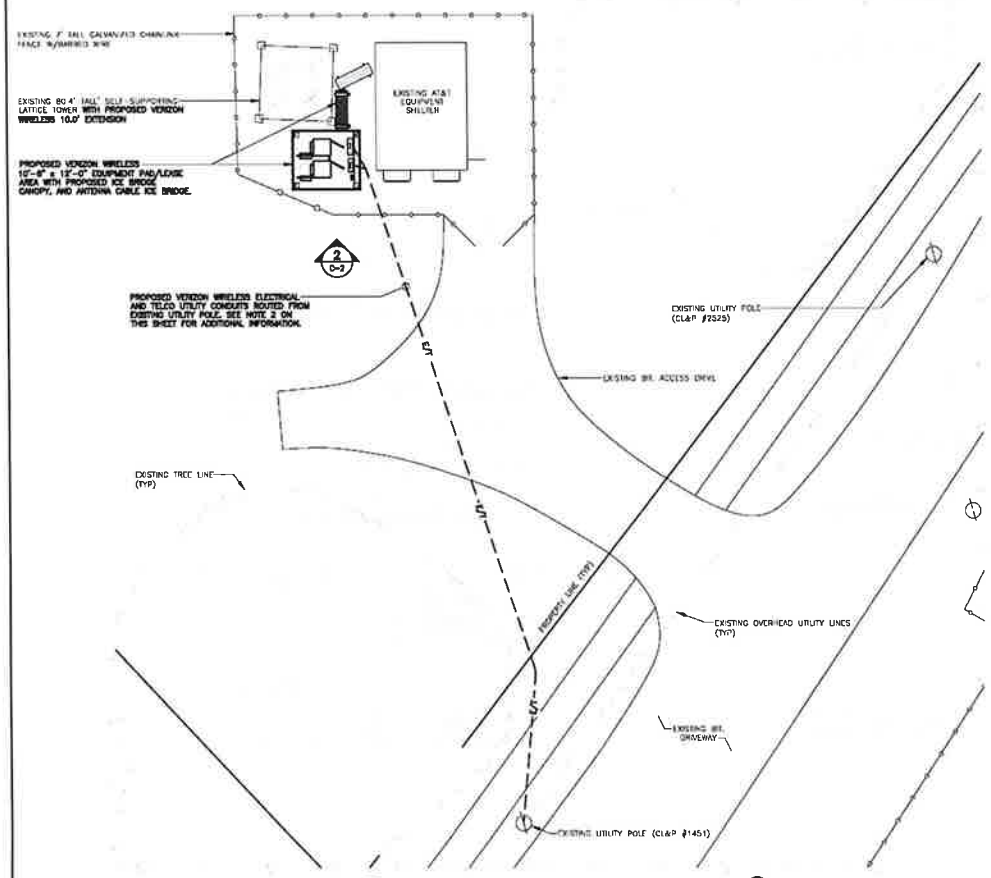
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22017.06) DATED XX/XX/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

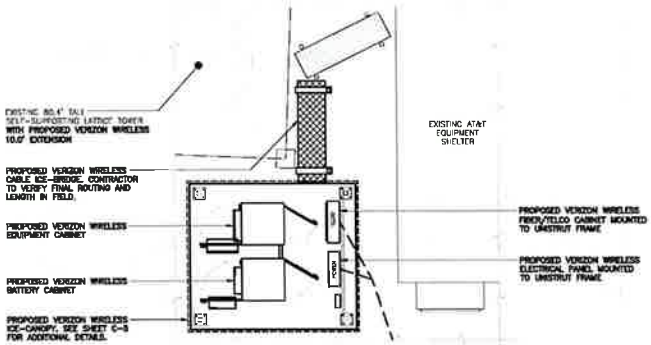
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22017.06) DATED XX/XX/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

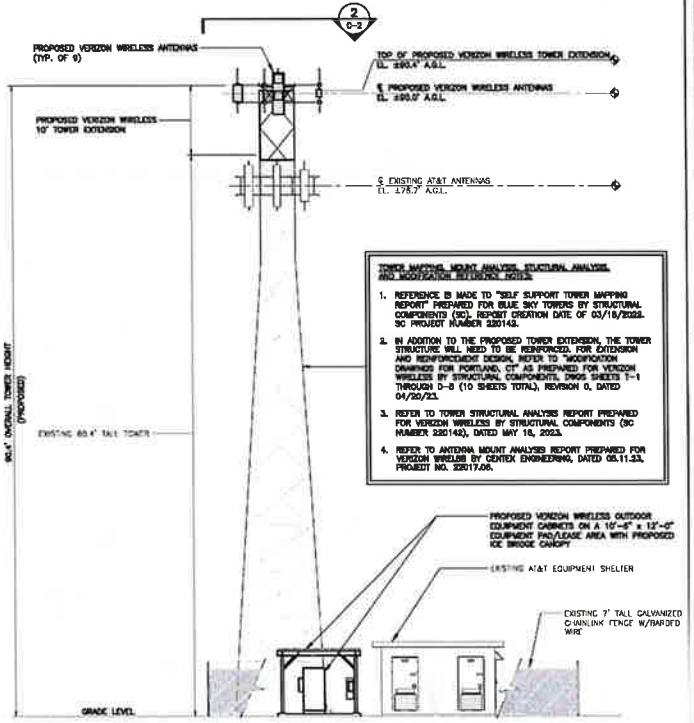
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



1 C-1 **PARTIAL SITE/COMPOUND PLAN - PROPOSED**
SCALE: 1/8" = 1'- 0"



2 C-1 **EQUIPMENT PLAN - PROPOSED CONDITIONS**
SCALE: 3/16" = 1'-0"



TOWER MAPPING, MOUNT ANALYSIS, STRUCTURAL ANALYSIS, AND MODIFICATION REFERENCE NOTES:

1. REFERENCE IS MADE TO "SELF SUPPORT TOWER MAPPING REPORT" PREPARED FOR BLUE SKY TOWERS BY STRUCTURAL COMPONENTS (SC). REPORT CREATION DATE OF 03/18/2022. SC PROJECT NUMBER 220143.
2. IN ADDITION TO THE PROPOSED TOWER EXTENSION, THE TOWER STRUCTURE WILL NEED TO BE REINFORCED. FOR EXTENSION AND REINFORCEMENT DESIGN, REFER TO "MODIFICATION DRAWINGS FOR PORTLAND, CT" AS PREPARED FOR VERIZON WIRELESS BY STRUCTURAL COMPONENTS. DWGS SHEETS T-1 THROUGH D-8 (10 SHEETS TOTAL), REVISION 0, DATED 04/20/23.
3. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED FOR VERIZON WIRELESS BY STRUCTURAL COMPONENTS (SC NUMBER 220142), DATED MAY 16, 2023.
4. REFER TO ANTENNA MOUNT ANALYSIS REPORT PREPARED FOR VERIZON WIRELESS BY CENTEK ENGINEERING, DATED 05.11.23, PROJECT NO. 22017.06.

3 C-1 **WESTERN ELEVATION**
SCALE: 1/8" = 1'- 0"

REV.	DATE	BY	DESCRIPTION
1	10/19/23	TJK	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	07/19/23	TJK	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

Sheets affected by this revision: C-1

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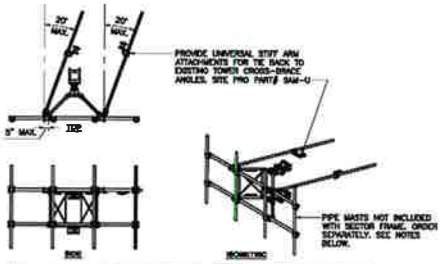
COMPOUND, EQUIPMENT PLAN & ELEVATION

C-1

Sheet No. 3 of 14

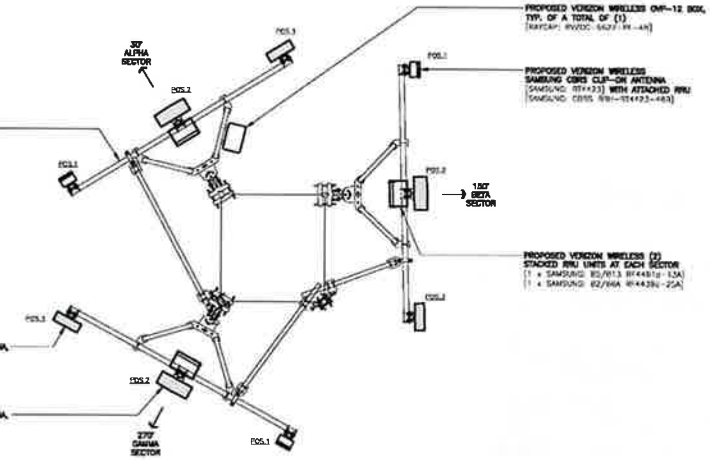


12 FT ANTENNA SECTOR MOUNTING FRAME			
EQUIPMENT	DESCRIPTION	QTY	WEIGHT
MAKE: SITE PRO MODEL: VFA12-HD	12 FT. HEAVY DUTY V-FRAME	3	735 LBS

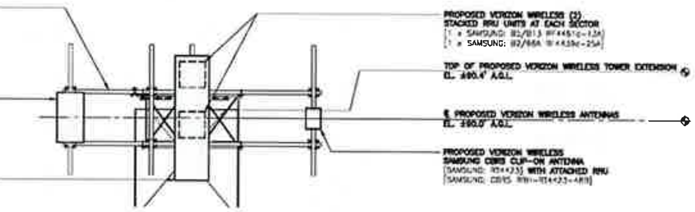
NOTES:

1. GUYED AND SST MOUNTING RANGE: 1 1/2" TO 9 1/2" ROUND LEGS AND 3" TO 6" ANGLES.
2. PIPE MASTS ARE NOT INCLUDED IN SECTOR FRAME KIT. ORDER SEPARATELY (SITE PRO PART# P3D120). WEIGHT LISTED ABOVE DOES NOT INCLUDE PIPE MASTS

1 / C-2 **SECTOR FRAME MOUNT DETAIL**
SCALE: 3/16" = 1'-0"



2 / C-2 **ANTENNA MOUNTING CONFIGURATION PLAN - PROPOSED**
SCALE: 3/8" = 1'- 0"



3 / C-2 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/8" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	03/12/24	TDK	LJB	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	11/08/23	BMP	LJB	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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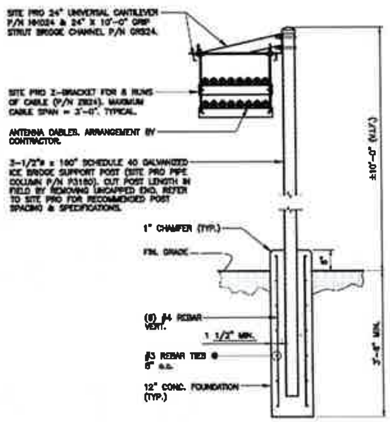
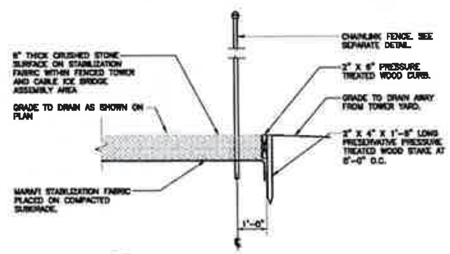
ANTENNA CONFIGURATION PLAN, ELEVATION AND DETAIL

C-2

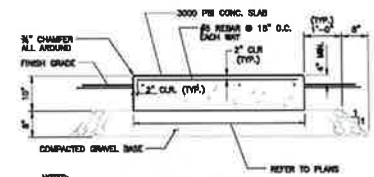
Sheet No. 4 of 11



1 / C-3 **ANTENNA CABLE ICE BRIDGE DETAIL**
SCALE: NOT TO SCALE



2 / C-3 **COMPOUND SURFACING DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. TOP OF CONC. PAD TOLERANCE IS 1/4"±.
2. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH PAD OR CAST CONDUITS IN PLACE AS APPLICABLE. COORDINATE SLEEVE/CONDUIT LOCATIONS WITH CONSTRUCTION MANAGER.
3. REFER TO NOTES ON SHEET N-1 FOR ADDITIONAL REQUIREMENTS.
4. COORDINATE EQUIPMENT CABINET AND PROPANE TANK HOLD-DOWN HARDWARE WITH RESPECTIVE MANUFACTURERS.

3 / C-3 **CONCRETE PAD DETAIL (TYP)**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
	12/12/24	TJK	TJB	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
A	11/08/23	SMP	TJB	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW

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PORTLAND CT, 06480

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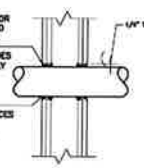
JOB NO. 23017.06

SITE AND MISCELLANEOUS DETAILS

C-3

Sheet No. 6 of 14

PIPE OR CONDUIT	ANNULAR SPACE IN.	MIN. FILL MATERIAL THICKNESS	F RATING HR
PIPE	3/4"	1 1/4"	2
CONDUIT	3/4"	3/4"	1

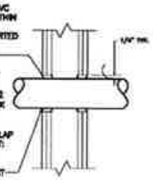


UL SYSTEM NUMBER: WL1051
F RATING – 1 & 2 HR.

1 / C-4 PIPE AND CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

SCALE: NOT TO SCALE

MAX. DIA. OF THROUGH PENETRANT	NOMINAL ANNULAR SPACE IN.	FILL MATERIAL TYPE
1"	1/2"	FSP 1100 PUTTY
2"	1"	FS 1900 SEALANT



UL SYSTEM NUMBER: WL2036
F RATING – 1 & 2 HR.

2 / C-4 PVC CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

SCALE: NOT TO SCALE

NOTES:

1. FLOOR OR WALL ASSEMBLY – MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 30-7/8 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

   A. STEEL FLOOR UNIT/FLOOR ASSEMBLY (NOT SHOWN) – AS AN ALTERNATE TO ITEM 1, THE FLOOR ASSEMBLY MAY CONSIST OF A FLUTED STEEL FLOOR UNIT/ CONCRETE FLOOR ASSEMBLY. THE FLOOR ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL FLOOR CEILING DESIGN IN THE FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   B. CONCRETE – MIN 2-1/2 IN. THICK REINFORCED LIGHTWEIGHT ON NORMAL WEIGHT (100-150 PCF) CONCRETE, AS MEASURED FROM THE TOP PLANE OF THE FLOOR UNITS.

   C. STEEL FLOOR AND FORM UNITS* – COMPOSITE OR NON-COMPOSITE 1-1/2 TO 3 IN. DEEP FLUTED GALV STEEL UNITS AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. MAX DIAM OF OPENING IS 30-7/8 IN.

2. THROUGH-PENETRANT – ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. TO MAX 7/8 IN. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   A. STEEL PIPE NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

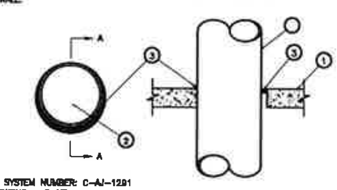
   C. COPPER PIPE NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   D. COPPER TUBING NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. CONDUIT NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.

   F. CONDUIT NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).

3. FILL, VOID OR CAVITY MATERIAL* – SEALANT – MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE AND CONCRETE, A MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.

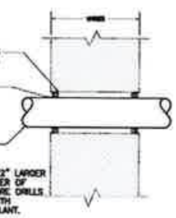


SECTION A–A

UL SYSTEM NUMBER: C-AJ-1291
F RATING – 2-HR

3 / C-4 METAL PIPE THROUGH CONCRETE FLOOR/ WALL OR BLOCK WALL

SCALE: NOT TO SCALE

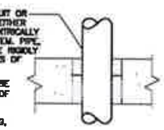


NOTE:
CORE HOLE 1 1/2" LARGER THAN THE DIAMETER OF THE CONDUIT. CORE DRILLS TO BE SEALED WITH ELASTOMERIC SEALANT.

4 / C-4 PIPE AND CONDUIT PENETRATION DETAIL IN NON-RATED PARTITION

SCALE: NOT TO SCALE

FLOOR OR WALL	MIN. THICK.	MAX. PIPE DIA.	MIN. ANNULAR SPACE	MAX. ANNULAR SPACE	MIN. FILL MAT. THICK.	MIN. FORM. MAT. THICK.	F RATING
F	2 3/4"	1 1/2"	3/8"	2 1/8"	1"	2 3/4"	2
F	2 3/4"	6"	3/8"	3/4"	1"	2 3/4"	2
F	2 3/4"	6"	3/8"	1"	2"	1 3/4"	2
F	4 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	1"	2"	2 1/2"	3
W	5 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
W	5 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
W	6 1/2"	1 1/2"	3/8"	2 1/8"	2"	3 1/2"	3
W	6 1/2"	6"	3/8"	1"	2"	2 1/2"	3



THICKNESS OF SEALANT APPLIED FLUSH W/THE TOP SURFACE OF BOTH SIDES OF FLOOR/WALL (SEE TABLE), USG INTERIORS-TYPE SS

UL SYSTEM NUMBER: CAJ1020

F RATING – 3 HR.

5 / C-4 PIPE AND CONDUIT PENETRATION DETAIL IN CONCRETE OR MASONRY

SCALE: NOT TO SCALE

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0	02/12/24	TOK	LM	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
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TYPICAL CONDUIT PENETRATION DETAILS

C-4

Sheet No. 8 of 14

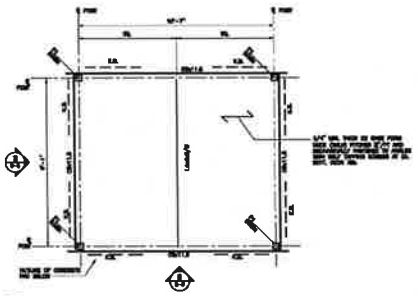
PLAN NOTES AND LEGEND

1. VERIFY ALL DIMENSIONS, ELEVATIONS, EXISTING FRAMING MEMBER SIZES AND GENERAL CONDITIONS PRIOR TO COMMENCEMENT OF WORK. NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCIES BETWEEN THESE DRAWINGS AND EXISTING CONDITIONS.

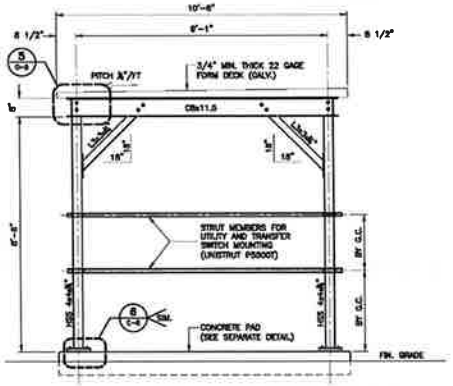
INDICATES HSS4x4x1/4 ASTM A500 GR. B (F_y = 46ksi) STEEL POST.

INDICATES SPAN DIRECTION.

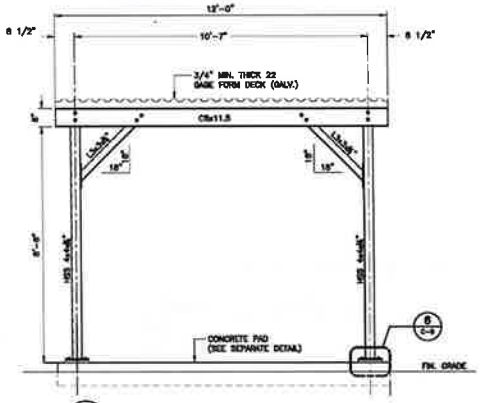
X.X. INDICATES L3x3x1/4 ASTM A36 (F_y=36 KSI) STEEL ANGLE



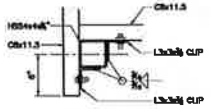
1 C-5 ICE BRIDGE CANOPY - ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"



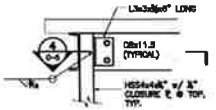
3 C-5 ICE BRIDGE CANOPY ELEVATION
1/2" = 1'-0"



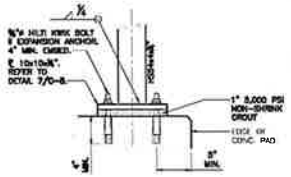
2 C-5 ICE BRIDGE CANOPY ELEVATION
SCALE: 1/2" = 1'-0"



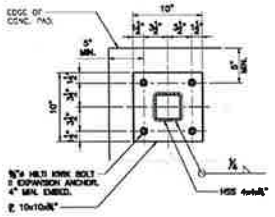
4 C-5 CANOPY FRAME CONNECTION
SCALE: 1-1/2" = 1'-0"



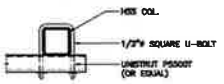
5 C-5 CANOPY FRAME CONNECTION
SCALE: 1-1/2" = 1'-0"



6 C-5 CANOPY POST CONNECTION
SCALE: 1-1/2" = 1'-0"



7 C-5 CANOPY POST BASE PLATE
SCALE: 1-1/2" = 1'-0"



8 C-5 STRUT TO COL. CONN. DETAIL (TYP)
SCALE: 1-1/2" = 1'-0"

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1	12/15/23	TAS	CONSTRUCTION DRAWINGS — ISSUED FOR CONSTRUCTION
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EQUIPMENT ICE BRIDGE CANOPY PLAN AND DETAILS

C-5

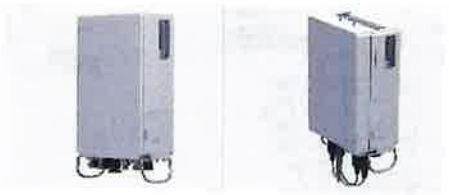
Sheet No. 7 of 14

MT6413-77A

ANTENNA		
EQUIPMENT	DIMENSIONS	
MAKE: SAMSUNG MODEL: MT6413-77A	28.90"H x 15.75"W x 5.51"D	

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS'S CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. ANTENNA HAS ITS OWN BUILT-IN RRU.

1 C-6 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE



RRH ONLY — ALL-IN-ONE ANTENNA & RRH

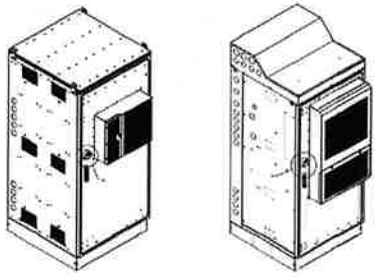
CBRS CLIP-ON ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RT4423	12"H x 8.7"W x 1.5"D	3.3 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RT4423-48(A/B)	11.8"H x 8.7"W x 4.2"D	15.43 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. RT4423-48A IS FOR DC
   RT4423-48B IS FOR AC (AC AND DC TYPE HAVE SAME SIZE AND WEIGHT)
3. DIMENSIONS AND WEIGHT SHOWN ARE FOR THE RRU ONLY.

2 C-6 **COMBINED RRH/CLIP-ON ANTENNA DETAIL**
NOT TO SCALE



CABINET-1200 (BATTERY) — CABINET-1200 (EQUIPMENT)

SIDE-BY-SIDE ANTENNA MOUNTING KIT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: CMC74-36E	80"H x 36"W x 43"D	453 LBS.
MAKE: COMMSCOPE MODEL: CMC74-36B	80"H x 36"W x 43"D	846 LBS.

NOTES:
1. CONTRACTOR TO CONFIRM CABINET MAKE/MODEL AND QUANTITY WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

3 C-6 **PROPOSED EQUIPMENT CABINET DETAIL**
SCALE: NOT TO SCALE

ELEVATION - FRONT

BOTTOM

12-PORT SECTOR ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: NHH-65B-R6	72"L x 19.6"W x 7.7"D	83.1 LBS. (W/OUT MOUNT KIT)

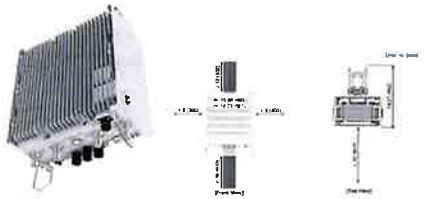
4 C-6 **SECTOR ANTENNA DETAIL**
NOT TO SCALE

RRH - ISOMETRIC — RRH CLEARANCES

DUAL BAND RRH (REMOTE RADIO UNIT)				
EQUIPMENT	BANDS	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4439d-25A	B2: PCS (1900 MHz) B66: AWS (2100 MHz)	15.0"H x 15.0"W x 10.0"D	74.7 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-6 **DUAL-BAND AWS/PCS MACRO RADIO UNIT DETAIL**
SCALE: NOT TO SCALE



RRH - ISOMETRIC — RRH CLEARANCES

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4416d-13A	14.96"H x 14.96"W x 10.23"D	79.1 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-6 **DUAL-BAND 700/850 MHZ MACRO RADIO UNIT DETAIL**
SCALE: NOT TO SCALE

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RF DETAILS

C-6

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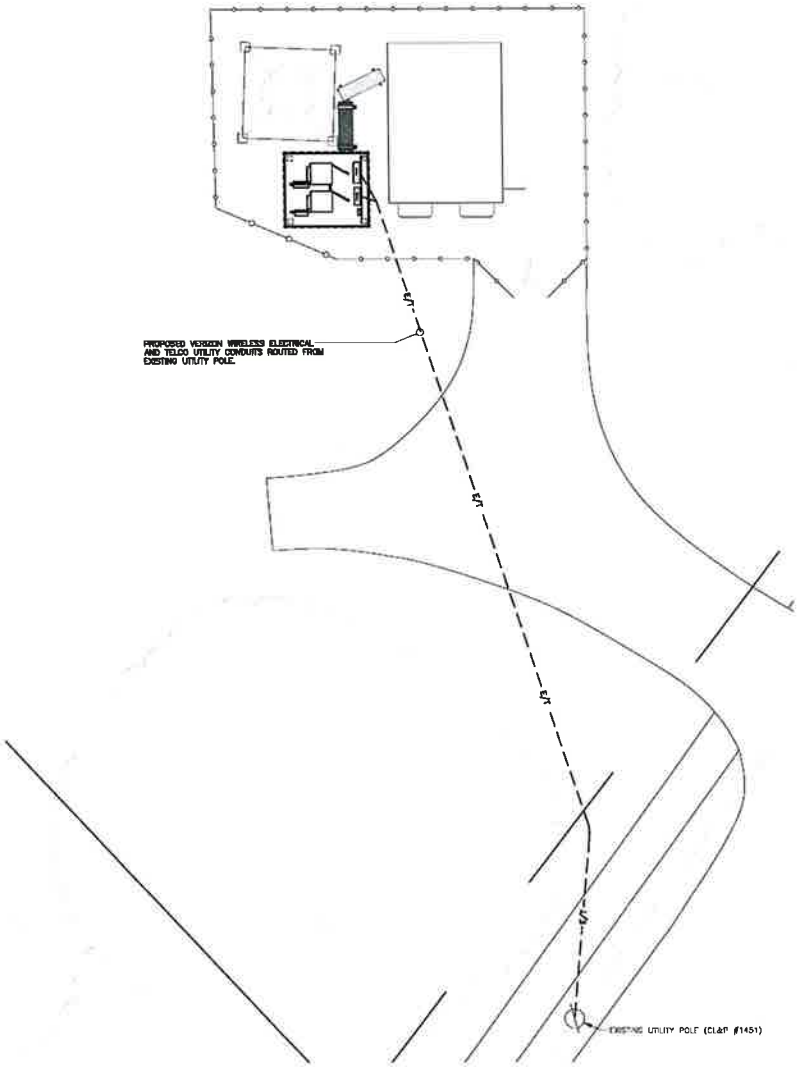
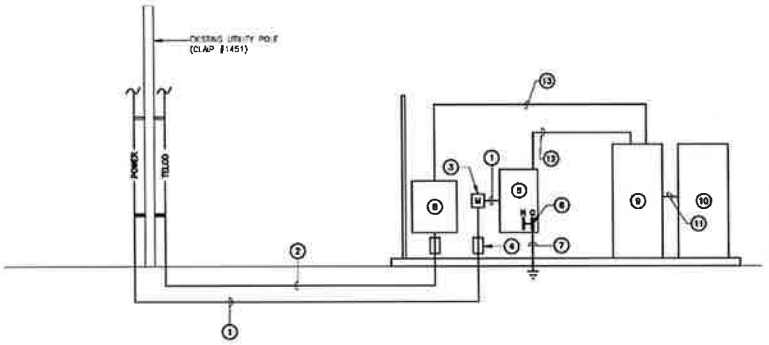


1 E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1/8" = 1'- 0"

RISER NOTES

1. (3) #3/0 AWG, 3"C.
2. NEW 4" TELCO CONDUIT ROUTED FROM EXISTING UTILITY POLE TO NEW EQUIPMENT LOCATION. CONTRACTOR TO VERIFY FINAL ROUTING IN FIELD.
3. 200A, 240V, 1Ø UTILITY COMPANY APPROVED METER SOCKET.
4. EXPANSION COUPLING (TYPICAL).
5. NEW 200A, 240V, 1Ø, ILC CABINET
6. #4 AWG MAIN BONDING JUMPER.
7. #4 AWG GROUNDING ELECTRODE BONDED TO EQUIPMENT GROUND RING. REFER TO GROUNDING SCHEMATIC ON DWG. E-2.
8. 3' X 3' X 1' HOFFMAN BOX.
9. VERIZON WIRELESS EQUIPMENT CABINET
10. VERIZON WIRELESS BATTERY CABINET
11. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
12. POWER CONDUIT AND CONDUCTORS FOR CABINETS. COORDINATE WITH MANUFACTURER AND CONSTRUCTION MANAGER.
13. CONDUITS AND CONDUCTORS FOR TELCO CONNECTION TO EQUIPMENT CABINETS AS REQUIRED BY MANUFACTURER AND CONSTRUCTION MANAGER FOR PROPER OPERATION OF EQUIPMENT.



2 E-1 **ELECTRICAL RISER DIAGRAM**
SCALE: NOT TO SCALE

REV.	DATE	BY	DESCRIPTION
1	10/18/23	TM	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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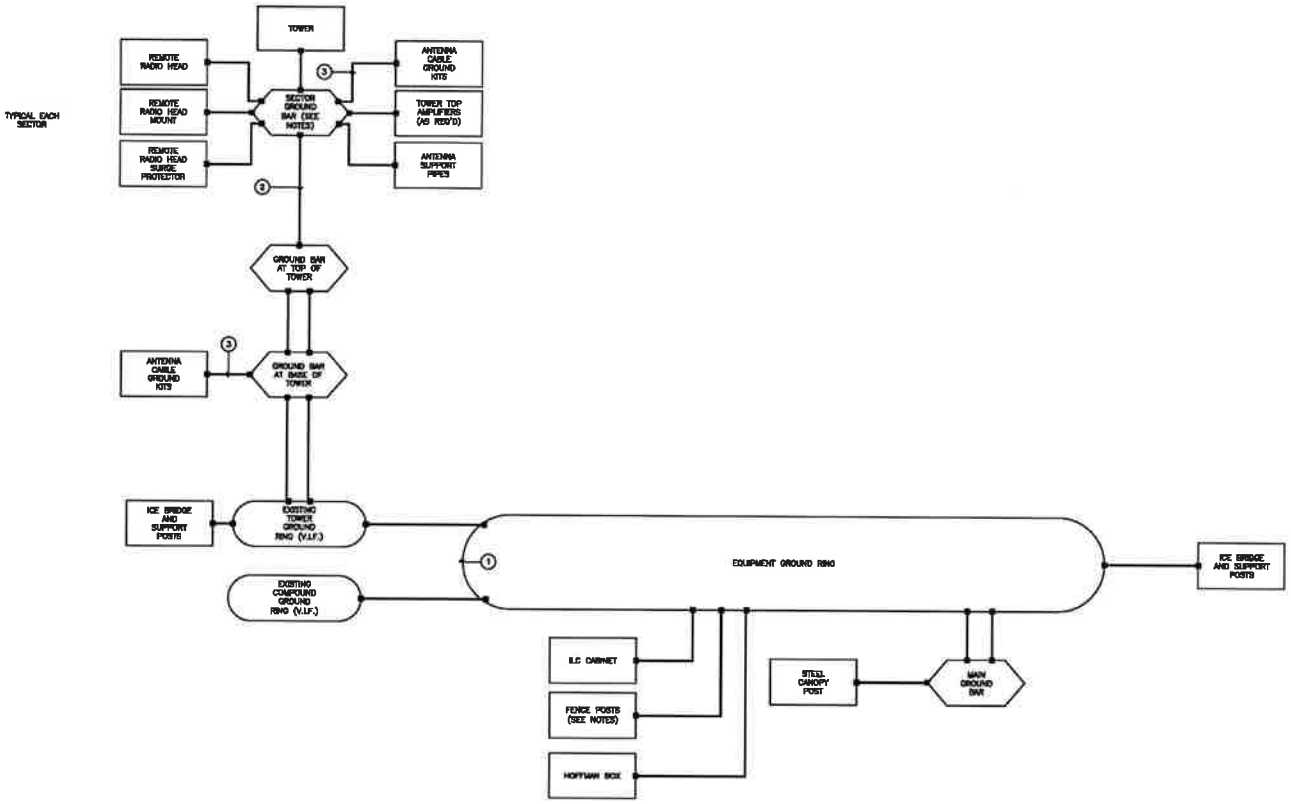
ELETRICAL CONDUIT ROUTING AND RISER DIAGRAM

E-1

Sheet No. 3 of 14



1 / E-2 ELECTRICAL SCHEMATIC DIAGRAM
SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

1. GROUND RING, #2 AWG BCW
2. #2/0 GREEN INSULATED
3. #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
12. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
13. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
14. BOND PROPANE TANK TO GROUND RING PER NEC AND MANUFACTURERS SPECIFICATIONS. COORDINATE WITH TANK MANUFACTURER FOR REQUIREMENTS PRIOR TO INSTALLATION.
15. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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ELECTRICAL SCHEMATIC DIAGRAM

E-2

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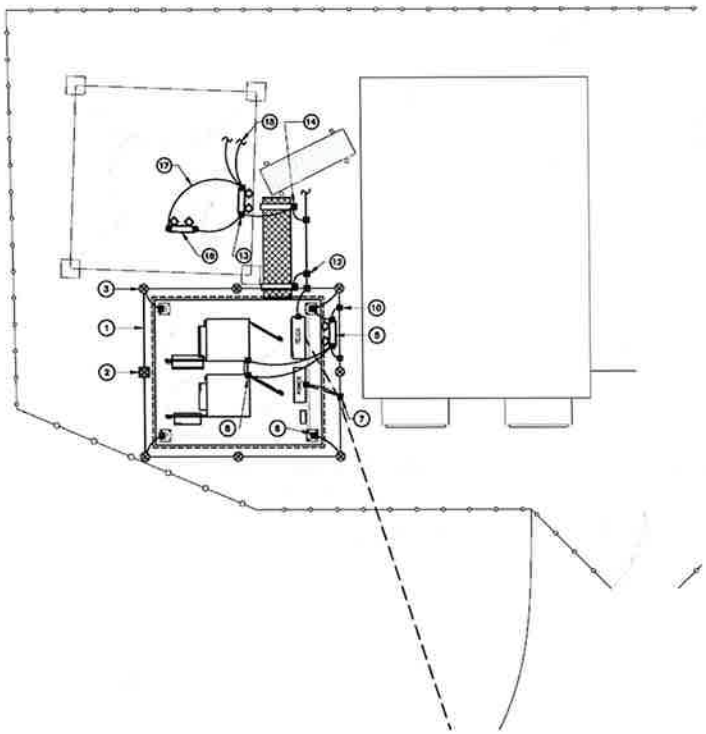
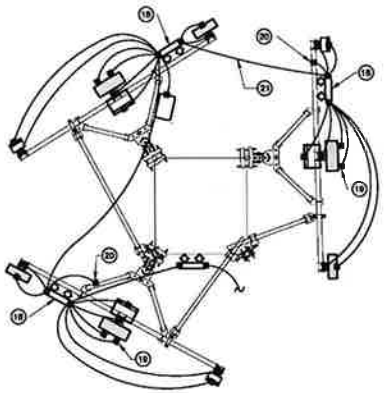
GROUNDING PLAN NOTES:

1. #2 SOLID TINNED BCW GROUND RING (INSTALL AS SHOWN ALONG COMPOUND PERIMETER, AND COMPLETELY ENCIRCLING THE EQUIPMENT PAD).
2. GROUNDING ROD WITH ACCESS (TYP.) SEE DETAILS.
3. GROUNDING ROD (TYP.) SEE DETAILS.
4. CONNECT FENCE TO COMPOUND GROUNDING RING.
5. MAIN GROUND BAR TYP.
6. BOND CANOPY POST TO GROUND RING TYP. EACH CORNER.
7. BOND CABINETS TO GROUND RING PER NEC AND MANUFACTUTIER REQUIREMENTS.
8. BOND EQUIPMENT CABINETS TO GROUND BAR PER NEC AND MANUFACTURER REQUIREMENTS.
9. NOT USED.
10. BOND GROUND BAR TO GROUND RING TYP. 2 PLACES.
11. NOT USED.
12. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING SEE DETAILS.
13. LOWER TOWER MOUNTED GROUND BAR.
14. BOND GROUND BAR TO ICE-BRIDGE.
15. BOND GROUND BAR TO TOWER GROUND RING TYP.
16. UPPER TOWER MOUNTED GROUND BAR.
17. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR. TYP. 2 PLACES
18. SECTOR GROUND BAR TYP.
19. BOND ANTENNA MOUNTING PIPES TO SECTOR GROUND BAR.
20. BOND SECTOR GROUND BAR TO ANTENNA FRAME STEEL TYP.
21. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.



1 E-3 **COMPOUND GROUNDING PLAN**
SCALE: NOT TO SCALE



2 E-3 **ANTENNA GROUNDING PLAN**
SCALE: NOT TO SCALE

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A	10/19/26	CONSTRUCTION DRAWINGS — ISSUED FOR CONSTRUCTION
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ELECTRICAL GROUNDING PLANS

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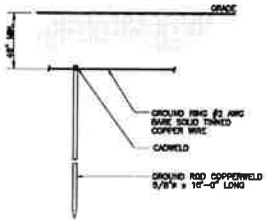
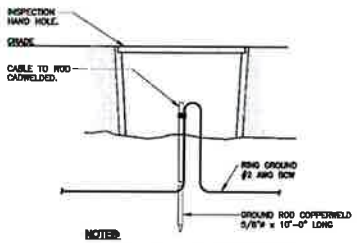


NOTES:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

1 E-4 **GROUND ROD DETAIL**
SCALE: NOT TO SCALE

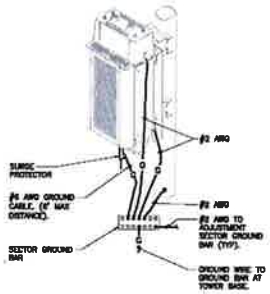


NOTES:

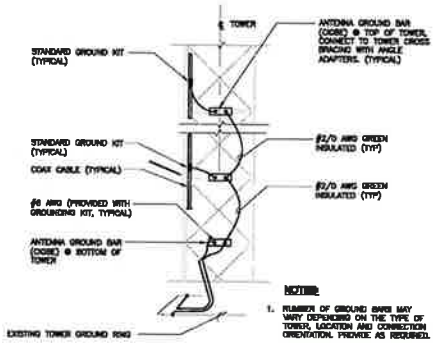
1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

2 E-4 **GROUND ROD WITH ACCESS DETAIL**
SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



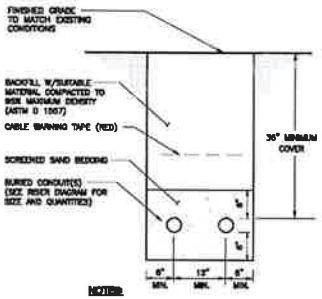
3 E-4 **RRH POLE MOUNT GROUNDING**
SCALE: NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

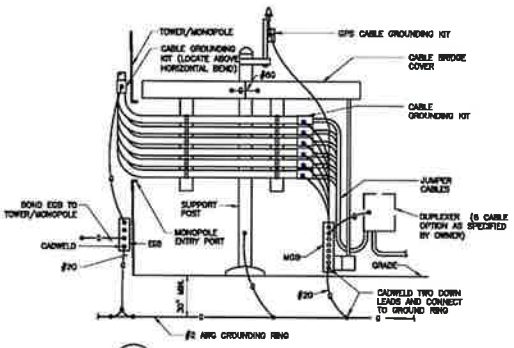
4 E-4 **ANTENNA CABLE GROUNDING - LATTICE TOWER**
SCALE: NOT TO SCALE



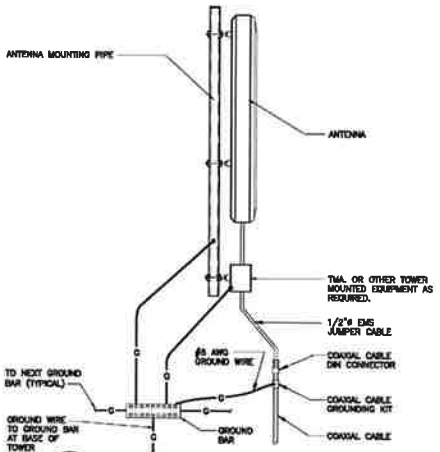
NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN UTILITY SOURCE AND SERVICE EQUIPMENT, COORDINATE WITH UTILITY COMPANY FOR BURIAL DEPTH REQUIREMENTS.
4. COORDINATE WITH ELECTRICAL ENGINEER WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN SERVICE EQUIPMENT AND EQUIPMENT SHELTER.

5 E-4 **TYPICAL ELECTRICAL TRENCH DETAIL**
SCALE: NOT TO SCALE



6 E-4 **CABLE BRIDGE GROUNDING DIAGRAM**
SCALE: NOT TO SCALE



7 E-4 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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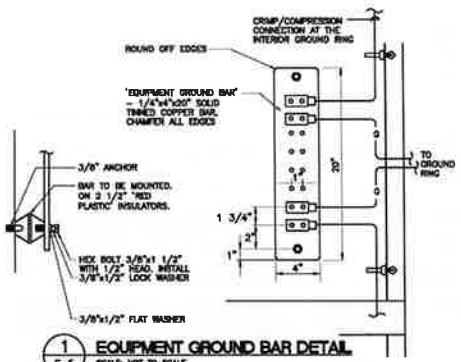
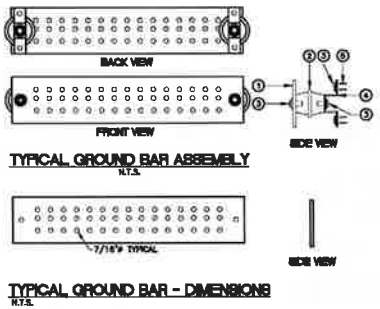


1 E-5 **EQUIPMENT GROUND BAR DETAIL**
SCALE: NOT TO SCALE

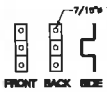


TYPICAL GROUND BAR ASSEMBLY
N.T.S.

TYPICAL GROUND BAR - DIMENSIONS
N.T.S.

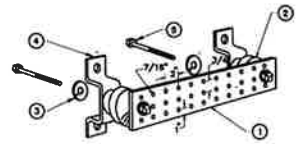
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-0"Lx4"Wx1/4"T.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE - 3/8"ø EXPANSION BOLT FOR CONCRETE.



BRACKET FOR GROUND BAR-DIMENSIONS
N.T.S.

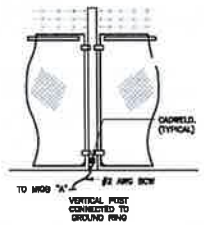
2 E-5 **MASTER/EQUIPMENT GROUND BAR DETAILS**
SCALE: NOT TO SCALE



NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-6.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

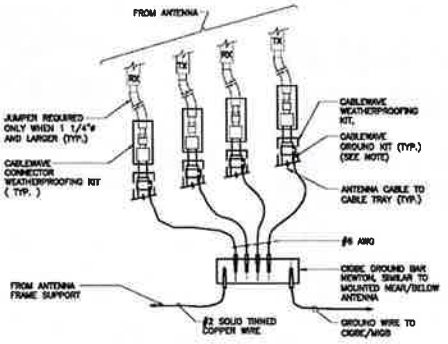
3 E-5 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. VERTICAL POSTS SHALL BE BONDED TO THE RING AT EACH CORNER AND AT EACH GATE POST. AS A MINIMUM ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 FOOT STRAIGHT RUN OF FENCE.
2. HORIZONTAL POLES SHALL BE BONDED TO EACH OTHER.
3. BOND EACH HORIZONTAL POLE / BRACE TO EACH OTHER AND TO EACH VERTICAL POST THAT IS BONDED TO THE EXTERIOR GROUND RING.

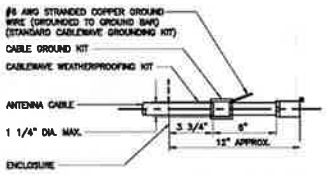
4 E-5 **GROUND-STD. DETAIL FENCE GROUNDING**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

5 E-5 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

6 E-5 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL 200A, 208V, 3P, 4 WIRE ELECTRIC SERVICE WITH SMART SUB-METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT.
2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
3. GENERATOR
4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, ETC. AS INDICATED OR NOTED ON PLANS.
5. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, GROUND BARS, ETC.
6. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
7. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN ENTANGLEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSCRIBED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION. INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH OVER NEC TABLE 300.5 [2]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE.	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE.	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.
[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, BOULEVARDS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".
[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-1", ETC.).

SECTION 16460

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16690).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16880
(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16950

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL TESTING AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS. FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	07/13/23	LJS	LJS	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
B	11/08/23	BBP	LJS	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

verizon

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless

SITE NAME: PORTLAND HB CT
SITE ID: 616480547
97 HIGH STREET
PORTLAND CT, 06480

DATE: 11/08/23
SCALE: AS NOTED
JOB NO.: 22017.06

ELECTRICAL SPECIFICATIONS

E-6

Sheet No. 14 of 14

Structural Components
Bringing It All Together.

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221

Voice: 866-386-7622

January 22, 2024

BST Management, LLC
352 Park Street
Suite 106
North Reading, MA 01864

Re: Comprehensive Structural Analysis Report

Structure:	80.4ft Self-Supporting Tower with 10ft Extension
Site Address:	97 High Street, Portland, Connecticut 06480 (Middlesex County) Latitude: 41.5807°N, Longitude: 72.6238°W
Site Name:	BST Management, LLC – Portland Verizon – Portland
Site Number:	BST Management, LLC – CT-1680 Verizon – 469381
SC Number:	230262
Status:	**Structure Passes (79% Capacity)** **Foundation Passes**

Per your request, Structural Components, LLC has completed a structural analysis for the above referenced project to verify the tower's compliance to the following design criteria:

Standard:	TIA-222-H *Structural Standard for Antenna Supporting Structures and Antennas*
Building Code:	2021 International Building Code w/Amendments 2022 Connecticut State Building Code
Design Basic Wind Speed without Ice:	120 mph 3-second gust V_{ULT}
Design Basic Wind Speed with Ice:	50 mph 3-second gust
Ice Thickness:	1" radial
Serviceability Basic Wind Speed:	60 mph 3-second gust
Exposure Category:	C
Topographic Category:	1
Ground Elevation:	345ft
Risk Category:	II
Seismic Site Class:	D, S_s=0.208, S_1=0.056
Seismic Design Category:	B

Please refer to the following structural analysis report, which gives complete details of the tower loading, results, information provided, and necessary assumptions.

We trust you find this report satisfactory. Please do not hesitate to contact us if you should have any questions or concerns.

Best Regards,
Structural Components LLC

Wesley Culver
Engineering Manager

/TR

Michael DeBoer, P.E.
Connecticut P.E. # 0018022

01/23/2024

1 LOADING CONFIGURATION

The following antennas, mounts, transmission lines, and other appurtenances were considered for the structural analysis.

Elevation (ft)		Equipment	Feedlines	Notes
Mount	Equip			
90.5	90.5	(1) 5/8" x 6' Lightning Rod	—	Existing
90.0	**90.0**	**(3) CommScope NNH4-65B-R6 Panels** **(3) Samsung RT4423 Panels** **(3) Samsung MT6413-77A Panels** **(3) Samsung CBRS RRH - RT4401-48A RRUs** **(3) Samsung RF4439d-25A RRUs** **(3) Samsung RF4440d-13A RRUs** **(1) CommScope FE-16148-OVP-B12 TMA** **(3) SitePro VFA12-HD Sector Frame Mounts**	**(2) 6x12 Hybrid**	**Verizon Final**
77.0	77.0	(1) L6" x 6" x 7/16" Ring Mount	—	Existing
76.7[4]	78.7	(3) Ericsson RRUS 32 B2 (1) Raycap DC6-48-60-18-8F SSD	(6) 7/8" TX (3) 0.92" OD DC (4) 3/4" OD DC (1) 3/8" Fiber (1) 1/2" Fiber	AT&T Final
	77.2	(3) Ericsson RRUS 32 B30[3] (3) Ericsson RRUS 32 B66A[3] (1) Raycap DC6-48-60-18-8F SSD		
	76.7	(3) CCITPA65R-BU6DA-K Panels (3) Ericsson AIR6449 B77D Panels (3) Ericsson AIR6419 B77G Panels (3) CCIDMP65R-BU6DA Panels (3) Ericsson RRUS 4478 B14 (3) Ericsson RRUS 4449 B5/B12 (1) Raycap DC9-48-60-24-8C-EV SSDs (3) 12' Sector Frame Mounts		
75.0	75.0	(1) L6" x 6" x 7/16" Ring Mount	—	Existing
73.0	73.0	(1) 2-3/8" x 8' Pipe Mount		
67.7	67.7	(1) L6" x 6" x 7/16" Ring Mount		

1) Elevations reference centerline of panel, yagi, mounts, and dish antennas, and base of whip antennas, in relation to the base of the tower.
2) Refer to the feed line diagram and analysis output in Appendix A for the location and orientation of feedlines and equipment.
3) Secondary appurtenances such as TMAs, Diplexers, and RRUs are considered to be installed directly behind panel antennas for frontal area shielding. See analysis output for magnitude of individual shielding.
4) Elevations adjusted from Structural Components Mapping dated 03/15/2022, Job # 220142.

2 RESULTS

The analysis was performed using tnxTower v8.1.1.0, a structural analysis program developed by Tower Numerics, Inc. specifically for the communication tower industry.

2.1 TOWER MEMBER STRESS LEVELS

The tower has the following stress ratios in its structural members.

Elev. (ft)	Member	Stress Ratio*
0 – 90.4	Legs	0.79
0 – 90.4	Bracing	0.64
0 – 90.4	Connections	0.64

Stress ratio (SR) criteria:
SR ≤ 1.00 is completely within code limits.
SR ≤ 1.05 is considered within acceptable tolerance of code limits.
SR > 1.05 is outside acceptable tolerance of code limits and requires structural modifications.
* Seismic analysis for similar structures under similar loading conditions has been shown to produce significantly lower stress ratios than wind and ice. Therefore, seismic analysis has not been included in the current analysis.

2.2 FOUNDATION REACTIONS

The reactions listed below are for the design wind speed listed. Reactions are factored loads.

Reaction Type	Current Wind Reactions	Current Iced Reactions	Foundation Status
Moment (ft-kips)	1,265.9	320.4	Passes*
Shear (kips)	22.7	5.6	
Axial (kips)	21.8	43.6	
Leg Compression (kips)	73.9	--	
Leg Uplift (kips)	64.4	--	
Leg Shear (kips)	11.1	--	

* See Appendix A for foundation calculations.

2.3 TOWER DEFLECTION

The tower deflections have been reviewed and are believed to be acceptable for the proposed equipment. The carrier(s) should review the deflections for the service wind condition included in Appendix A for compatibility with their equipment.

3 PROVIDED INFORMATION AND ASSUMPTIONS

The following information was directly used to generate this report, and can be found in Appendix B.

Document	Author	Date	Reference
Collocation Application	Verizon	11/21/2023	CT-1680
Mount Analysis	Centek Engineering	11/09/2023	22017.06 REV1
Structural Analysis Report – Verizon	Structural Components, LLC	05/18/2023	230262
Post Modification Inspection Report	Structural Components, LLC	09/19/2023	230193

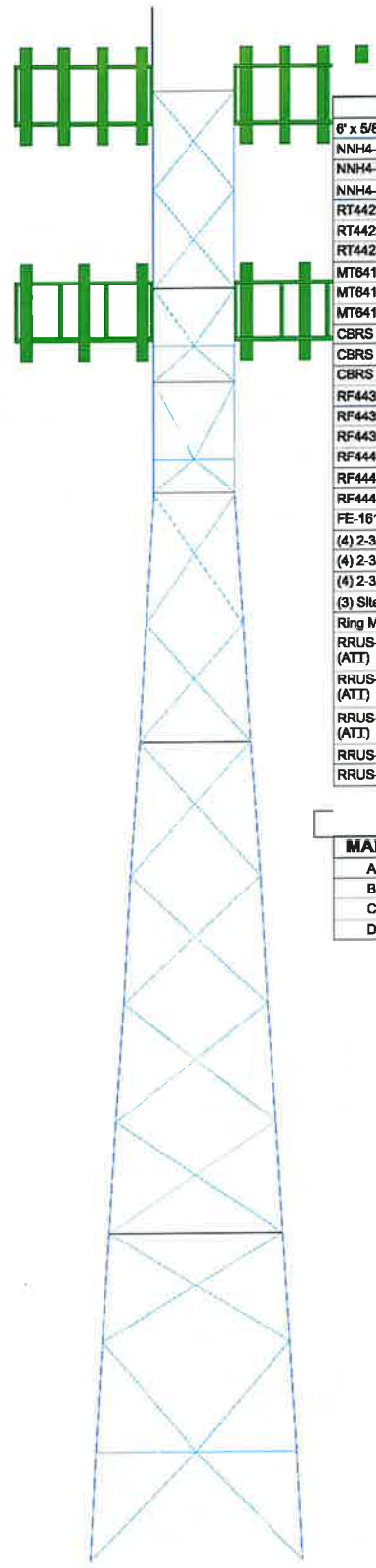
The following assumptions were made in order to complete the analysis. These assumptions must be checked. If they do not accurately represent the existing or proposed tower, foundation, soil, and loading conditions, we must be notified so that we can make the appropriate changes to our analysis, conclusions, and recommendations.

1. The tower and foundation are in good condition with no corrosion, damage or fatiguing issues which could reduce the carrying capacity of the tower.
2. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
3. All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.
4. The following assumptions regarding member minimum material or type apply to this structure, unless otherwise noted in analysis:
   - Angle Legs: A36
   - Angle Bracing: A36
   - Splice Bolts: A307
   - Gusset Plates: A36
   - Brace Bolts: A325N
5. The feedline and appurtenance configuration is as stated in the report. All antennas, coax, cables and waveguide cables are assumed to be properly installed and supported as per manufacturer requirement.
6. The support mounts and/or platforms are not analyzed and are considered adequate to support the loading.
7. All mounting systems connect at tower bracing points. Local stresses are not considered unless noted otherwise in analysis.
8. Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
9. The soil parameters are as per data supplied, or as assumed, and stated in the calculations.

4 CONCLUSIONS

To the best of our knowledge and belief the tower and foundations satisfy the requirements of the applicable codes and standards having jurisdiction over the work for the loadings and conditions as outlined in this report. **Structural modifications are not required at this time.**

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L5x5x5/16				L5x5x3/8			L4x4x3/8					L4x4x1/4
Leg Grade							A36							
Diagonals	L3x3x5/16		C			L2x2 1/2x3/16				B	L2 1/2x2 1/2x3/16		A	L2x2x1/4
Diagonal Grade							A36							
Top Girts	N.A.		L2x2 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16		N.A.		2L4x4x3/8	N.A.	D	L2 1/2x2 1/2x3/16
Bottom Girts					N.A.					E			N.A.	
Horizontals						N.A.				D	N.A.	D		N.A.
Red. Horizontals	F	L1 3/4x1 3/4x3/16					N.A.							
Red. Diagonals		L1 3/4x1 3/4x3/16					N.A.							
Inner Bracing		N.A.	L2x2x3/16		N.A.		L2 1/2x2x3/16		N.A.	G	N.A.	G		N.A.
Face Width (ft)	13.083	11.4363	10.6142	9.7793	8.883	7.9252	6.9059	6.0147						5.0416
# Panels @ (ft)	12.2597	2 @ 6.7075	1 @ 6.688	1 @ 6.792	1 @ 7.292	1 @ 7.792	1 @ 8.292	1 @ 7.25	1 @ 7.917	1 @ 2	1 @ 4.75	H	1 @ 3.5	2 @ 6.06292
Weight (lb)	9055.0	979.7	953.6	918.8	888.0	820.6	792.8	656.9	522.3	446.6	753.1	358.2	448.4	788.4



DESIGNED APPURTENANCE LOADING

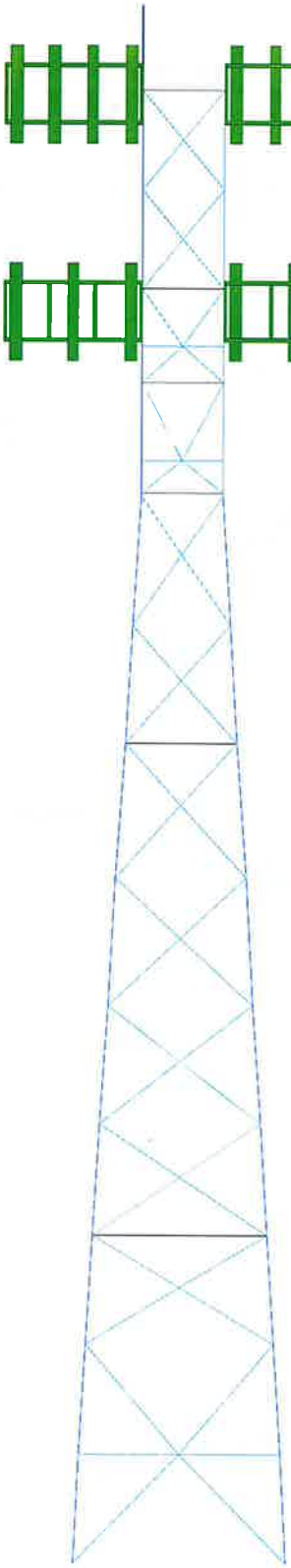
TYPE	ELEVATION	TYPE	ELEVATION
6' x 5/8" Lighting Rod	90.5	RRUS-32 (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
NNH4-65B-R6 (Verizon)	90	RRUS-32 (Full Frontal Shielding) (ATI)	76.7
RT4423 (Verizon)	90	DC6-48-60-18-8F (ATI)	76.7
RT4423 (Verizon)	90	DC6-48-60-18-8F (ATI)	76.7
RT4423 (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
MT6413-77A (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
MT6413-77A (Verizon)	90	TPA65R-BU6DA-K (ATI)	76.7
MT6413-77A (Verizon)	90	AIR6449 B77D (ATI)	76.7
CBRS RT4401 RRH (Verizon)	90	AIR6449 B77D (ATI)	76.7
CBRS RT4401 RRH (Verizon)	90	AIR6449 B77D (ATI)	76.7
CBRS RT4401 RRH (Verizon)	90	AIR6419 B77G (ATI)	76.7
RF4439d-25A (Verizon)	90	AIR6419 B77G (ATI)	76.7
RF4439d-25A (Verizon)	90	AIR6419 B77G (ATI)	76.7
RF4439d-25A (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
RF4440d-13A (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
RF4440d-13A (Verizon)	90	DMP65R-BU6DA (ATI)	76.7
RF4440d-13A (Verizon)	90	4478 RRU (ATI)	76.7
FE-16148-OVP-B12 (Verizon)	90	4478 RRU (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	4478 RRU (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	4449 RRU (ATI)	76.7
(4) 2-3/8" x 8' Pipe Mount (Verizon)	90	4449 RRU (ATI)	76.7
(3) SitePro VFA12-HD (Verizon)	90	4449 RRU (ATI)	76.7
Ring Mount	77	DC9-48-60-24-8C-EV (ATI)	76.7
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	(3) 12' Sector Frames (ATI)	76.7
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	Ring Mount	75
RRUS-32 (Full Frontal Shielding) (ATI)	76.7	2-3/8" x 8' Pipe Mount	73
RRUS-32 (ATI)	76.7	Ring Mount	67.7
RRUS-32 (ATI)	76.7		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: 240022			
Project: Portland (CT-1680)			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 01/22/24		Scale: NTS
Path:			Dwg No. E-1



Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L5x5x5/16			L5x5x3/8				L4x4x3/8					L4x4x1/4
Leg Grade							A36							
Diagonals	L3x3x5/16		C			L2x2 1/2x3/16				B	L2 1/2x2 1/2x3/16	A		L2x2x1/4
Diagonal Grade							A36							
Top Girts	N.A.		L2x2 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16		N.A.		2L4x4x3/8	N.A.	D	L2 1/2x2 1/2x3/16
Bottom Girts					N.A.					E			N.A.	
Horizontals	F					N.A.				D	N.A.	D		N.A.
Red. Horizontals	L1 3/4x1 3/4x3/16						N.A.							
Red. Diagonals	L1 3/4x1 3/4x3/16						N.A.							
Inner Bracing	N.A.		L2x2x3/16		N.A.		L2 1/2x2x3/16		N.A.		N.A.		G	N.A.
Face Width (ft)	13.083	11.4363	10.6142	9.7793	8.883	7.9252	6.9059	6.0147						5.0416
# Panels @ (ft)	2 @ 6.7075		1 @ 6.688	1 @ 6.792	1 @ 7.292	1 @ 7.792	1 @ 8.292	1 @ 7.25		1 @ 7.917	1 @ 4.75	H	1 @ 3.5	2 @ 6.08292
Weight (lb)	9055.0	953.8	819.8	685.0	620.6	556.9	792.6	497.4		852.5	735.1	309.2	448.6	798.4

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2 1/2x3/16	E	L3x3x3/16
B	L2x2x3/16	F	L1 3/4x1 3/4x3/16
C	L2 1/2x2 1/2x3/16	G	L2 1/2x2x3/16
D	L4x3 1/2x1/4	H	1 @ 2.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 78.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 73846 lb
SHEAR: 12790 lb

UPLIFT: -64310 lb
SHEAR: 11083 lb

AXIAL
43534 lb

SHEAR
5511 lb

MOMENT
320366 lb-ft

TORQUE 2925 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL
21718 lb

SHEAR
22639 lb

MOMENT
1265889 lb-ft

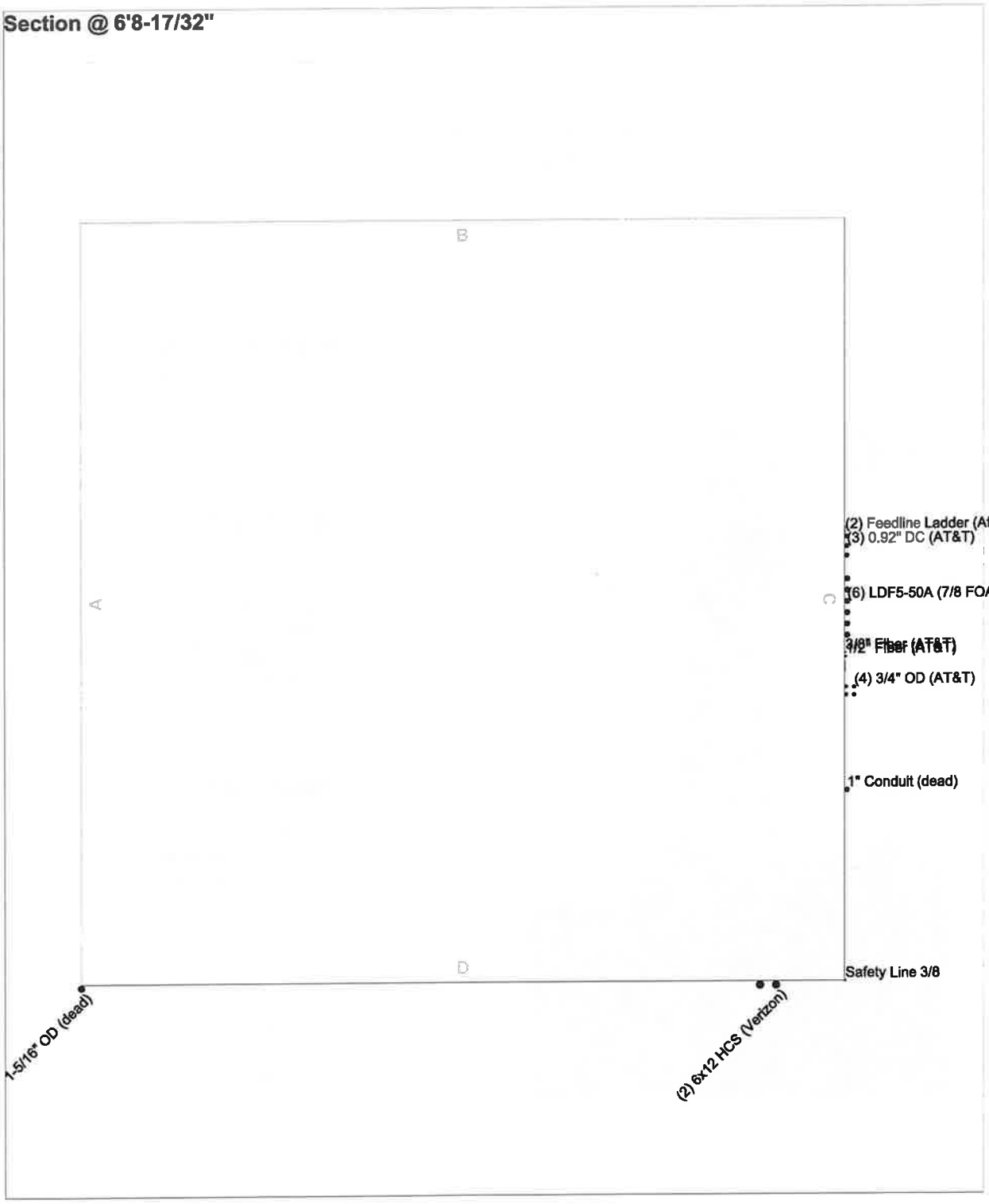
TORQUE 9732 lb-ft
REACTIONS - 120 mph WIND

Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: *240022*			
Project: *Portland (CT-1680)*			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 01/22/24		Scale: NTS
Path:			Dwg No. E-1

Feed Line Plan
6'8-17/32"

_____ Round _____ Flat _____ App In Face _____ App Out Face



Structural Components, LLC
1870 West 64th Lane, Unit A
Denver, CO 80221
Phone: (866) 386-7622
FAX:

Job: 240022			
Project: Portland (CT-1680)			
Client: BST Management, LLC	Drawn by: treed		App'd:
Code: TIA-222-H	Date: 01/22/24		Scale: NTS
Path:			Dwg No. E-7

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Structural Components, LLC
1870 W. 64th Lane
Denver, CO 80221

Voice: 720-304-8839
Fax: 720-489-3764

SELF SUPPORTING TOWER
POST MODIFICATION INSPECTION REPORT

Site Name - Portland
Site # - CT-1680

PREPARED FOR:

BLUE SKY TOWERS LLC

PREPARED BY:

Stephen Kasanovich
Structural Components, LLC
SC Job # 230193

DATE:

September 19, 2023

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REPORT SUMMARY

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
SITE (ID):	CT-1680	TOWER TYPE:	SST
ADDRESS:	97 High Street	TOWER HEIGHT:	90'
	Portland, CT 06480	WEATHER:	75F, sunny, N wind 0-5mph
LEAD:	Wilson Worn	SUPPORT:	Ani Doke

PROJECT

Subject: Post Modification Inspection of SST Tower Reinforcement and Extension

Location: 97 High Street
Portland, CT 06480

Structure: 90' SST Tower

Purpose: The purpose of this post modification inspection is to ensure that the proposed modification has been completed per the attached structural modification drawings and meets all guidelines from Structural Components.

PARTICIPATION PERSONNEL

SRR Representative: Ricardo Costa
Blue Sky Towers, LLC
352 Park St STE 106
North Reading, MA 01864

SUPPLEMENTAL INFORMATION

Appendix A - Redlined Modification Drawings
Appendix B - Photos During and After Construction
Appendix C - Material Testing Reports

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REPORT CONTENTS

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
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	Portland, CT 06480	WEATHER:	75F, sunny, N wind 0-5mph
LEAD:	Wilson Worn	SUPPORT:	Ani Doke

Note: See Modification Drawings for Referenced Standards

REQUIREMENT FOR STRUCTURAL OBSERVATION		
STRUCTURAL OBSERVATION REQUIRED	DESIGN PARAMETER	NOTES
NO	EXPOSURE CATEGORY B AND VASD ≥ 120 MPH AND AT LEAST ONE OF THE FOLLOWING CRITERIA: I) RISK CATEGORY III OR IV AND/OR II) HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT	
NO	EXPOSURE CATEGORY C OR D AND VASD ≥ 110 MPH AND AT LEAST ONE OF THE FOLLOWING CRITERIA: I) RISK CATEGORY III OR IV AND/OR II) HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT	
NO	SEISMIC DESIGN CATEGORY C, D, E OR F AND AT LEAST ONE OF THE FOLLOWING CRITERIA: I) RISK CATEGORY III OR IV AND/OR II) HEIGHT OF THE STRUCTURE IS GREATER THAN 75 FT	

INSPECTION OF SOILS AND EARTHWORK CONSTRUCTION		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
NO	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY ***PERIODIC***	
NO	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL ***PERIODIC***	
NO	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS ***PERIODIC***	
NO	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL ***CONTINUOUS***	
NO	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY ***PERIODIC***	

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REPORT CONTENTS

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
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LEAD:	Wilson Worn	SUPPORT:	Anl Doke

Note: See Modification Drawings for Referenced Standards

INSPECTION OF REINFORCED CONCRETE CONSTRUCTION

INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
NO	INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT. ***PERIODIC***	
NO	INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1705.2.2, ITEM 2b --	
NO	INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE ***CONTINUOUS***	
NO	INSPECTION OF HORIZONTAL OR UPWARD SLOPING ANCHORS INSTALLED IN HARDENED CONCRETE ***CONTINUOUS***	
NO	INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE (OTHER ORIENTATIONS) ***PERIODIC***	
NO	VERIFYING USE OF DESIGN MIX ***PERIODIC***	
NO	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE ***CONTINUOUS***	
NO	INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURES AND TECHNIQUES ***PERIODIC***	
NO	INSPECTION OF PRESTRESSED CONCRETE: a. APPLICATION OF PRESTRESSING FORCES b. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC-FORCE-RESISTING SYSTEM ***CONTINUOUS***	
NO	ERECTION OF PRECAST CONCRETE MEMBERS ***PERIODIC***	
NO	VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POSTTENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS ***PERIODIC***	
NO	INSPECTION OF FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED ***PERIODIC***	

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REPORT CONTENTS

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
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LEAD:	Wilson Worn	SUPPORT:	Anl Doke

Note: See Modification Drawings for Referenced Standards

MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
YES	IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS ***PERIODIC***	APPROVED
YES	MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED ***PERIODIC***	MATERIAL CERTIFICATIONS AVAILABLE, APPROVED
INSPECTION OF HIGH STRENGTH BOLTING		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
YES	SNUG TIGHT JOINTS ***PERIODIC***	APPROVED
NO	PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCHMARKING, TWIST OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION ***PERIODIC***	
NO	PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCHMARKING, OR CALIBRATED WRENCH METHODS OF INSTALLATION ***CONTINUOUS***	
MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD-FORMED STEEL DECK		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
YES	FOR STRUCTURAL STEEL, IDENTIFICATION MARKINGS TO CONFORM TO AISC 303 ***PERIODIC***	APPROVED
NO	FOR OTHER STEEL IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS ***PERIODIC***	
YES	MANUFACTURER'S CERTIFIED TEST REPORTS ***PERIODIC***	MATERIAL CERTIFICATIONS AVAILABLE, APPROVED
MATERIAL VERIFICATION OF WELD FILLER MATERIALS		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
YES	IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS ***PERIODIC***	
YES	MANUFACTURER'S CERTIFICATION OF COMPLIANCE REQUIRED ***PERIODIC***	
INSPECTION OF WELDING		
INSPECTION REQUIRED	VERIFICATION AND INSPECTION	NOTES
NO	COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS ***CONTINUOUS***	
NO	MULTIPASS FILLET WELDS ***CONTINUOUS***	
NO	SINGLE-PASS FILLET WELDS >5/16" ***CONTINUOUS***	
NO	PLUG AND SLOT WELDS ***CONTINUOUS***	
YES	SINGLE-PASS FILLET WELDS <5/16" ***PERIODIC***	

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PHOTO SUMMARY

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
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Item #1 on S-1 Sheet

INSTALL NEW 1-3/4"x1-3/4"x3/16" ANGLE SUB-HORIZONTALS AND1-3/4"x1-3/4"x3/16" ANGLE SUB-DIAGONALS FROM 0' - 13' 4"













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PHOTO SUMMARY

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	Blue Sky Towers	DATE AT SITE:	Monday, September 11, 2023
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LEAD:	Wilson Worn	SUPPORT:	Ani Doke

Item #2 on S-1 Sheet

REPLACE EXISTING TOP GIRTS WITH NEW 2-1/2"x2"x1/4" ANGLES AT 20'










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PHOTO SUMMARY

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

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Item #3 on S-1 Sheet

INSTALL NEW 10' TOWER EXTENSION AT 80'. INSTALL 5/8" x 6' LIGHTNING ROD TO THE EXTENSION TOP GIRT.

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PHOTO SUMMARY

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	Portland, CT 06480	WEATHER:	75F, sunny, N wind 0-5mph
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Item #3 on S-1 Sheet

INSTALL (2) NEW SAFETY CLIMB SYSTEMS FROM 0' - 91'

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1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	SRR Towers, Inc	DATE AT SITE:	Monday, September 11, 2023
SITE (ID):	CT-1680	TOWER TYPE:	SST
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LEAD:	Wilson Worn	SUPPORT:	Ani Doke

APPENDIX A

REDLINED MODIFICATION DRAWINGS

Friday, April 21, 2023 2:31:37 PM

Z:\Jobs\Blue Sky Tower III LLC\Portland - CT 1680\230218 - RFQ QTE PO SA INV\Drawings\Upgrade_Drawings\

MODIFICATION DRAWINGS FOR PORTLAND, CT

verizonwireless

SITE NAME:

BST MANAGEMENT, LLC - PORTLAND
VERIZON - PORTLAND

SITE NUMBER:

BST MANAGEMENT, LLC - CT-1680
VERIZON - 469381

SITE INFORMATION

SITE ADDRESS:
97 HIGH STREET
PORTLAND CT 06480

SITE COORDINATES:
LATITUDE: 41.5807° N
LONGITUDE: 72.6238° W

SITE ACCESS ISSUES:
NO SITE ACCESS ISSUES NOTED.

CODE COMPLIANCE

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

DESIGN DATA

STANDARD:
TIA-222-H
BUILDING CODE:
2021 INTERNATIONAL BUILDING CODE W/ AMENDMENTS
2022 CONNECTICUT STATE BUILDING CODE
DESIGN BASIC WIND SPEED WITHOUT ICE:
120 MPH 3-SEC. GUST ULTIMATE
DESIGN BASIC WIND SPEED WITH ICE:
50 MPH 3-SEC. GUST
ICE THICKNESS:
1" RADIAL
SERVICEABILITY BASIC WIND SPEED:
60 MPH 3-SEC. GUST
EXPOSURE CATEGORY:
C
TOPOGRAPHIC CATEGORY:
1
GROUND ELEVATION:
345 FT
RISK CATEGORY:
II
SEISMIC SITE CLASS:
D, Ss= 0.280, S1=0.056
SEISMIC DESIGN CATEGORY:
B

PROJECT SUMMARY

APPLICANT/LESSEE:
VERIZON
CONTRACTORS:
CONSTRUCTION:
TBD.
CONSULTANTS:
STRUCTURAL COMPONENTS, LLC
1-866-386-7622
FOR ENGINEERING QUESTIONS CONTACT: WESLEY CULVER
FOR CONSTRUCTION AND FIELD SERVICES QUESTIONS CONTACT: HOWARD ROTCHFORD
TOWER OWNER:
BST MANAGEMENT, LLC
352 PARK STREET
SUITE 106
NORTH READING, MA 01864

SHEET INDEX

ARCHITECTURAL:
T-1 TITLE SHEET
GN-1 GENERAL CONSTRUCTION NOTES
GN-2 SPECIAL INSPECTIONS
STRUCTURAL:
BOM BILL OF MATERIALS
S-1 SPECIFICATIONS
DETAILS:
D-1 SUB-DIAG. & SUB-HORZ. INSTALL DETAILS
D-2 TOP GIRT INSTALL DETAILS
D-3 TOWER EXTENSION DETAILS
D-4 SAFETY CLIMB INSTALL DETAILS
D-5 SAFETY CLIMB INSTALL DETAILS (CONT'D)

BLUE SKY TOWERS LLC

Structural Components
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC

97 HIGH STREET
PORTLAND CT 06480

SELF SUPPORT
TOWER
MODIFICATION

TITLE SHEET

T-1 | 0

GENERAL NOTES:

1. THE MODIFICATIONS OUTLINED IN THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE TIA-222-H TOWER CODE.
2. PLANS, SECTIONS, AND DETAILS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.
3. UNLESS NOTED OTHERWISE = U.N.O.
4. ALL WORK ON THESE DRAWINGS SHALL BE PERFORMED BY A QUALIFIED CONTRACTOR WITH A MINIMUM OF 5 YEARS OF PAST TOWER EXPERIENCE AND SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE WITH WORKING KNOWLEDGE OF THE TIA CODE "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS".
5. CONTRACTOR AND/OR SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PERMITTING REQUIRED OR PROVIDE PROOF THAT THE LOCAL JURISDICTION DOES NOT REQUIRE A PERMIT FOR THE WORK COMPLETED.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL CODES AND OSHA SAFETY REGULATIONS AND PERFORMED UNDER NORMAL WEATHER CONDITIONS WITH WINDS NOT IN EXCESS OF 30 MPH.
7. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL EXISTING EQUIPMENT, ANTENNAS, TX AND STRUCTURES. THE CONTRACTOR IS ALSO RESPONSIBLE FOR THE PROTECTION OF WORKERS, PUBLIC AND PRIVATE PROPERTY DURING CONSTRUCTION UP UNTIL COMPLETION OF WORK.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE FOR COMPENSATIONS SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN THE DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER/CLIENT FOR CONSIDERATIONS BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREA.
9. ANY SUBSTITUTIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR INSTALLATION.
10. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.
11. CONTRACTOR SHALL PROMPTLY REMOVE ANY AND ALL DEBRIS FROM SITE AND RESTORE AS BEST AS POSSIBLE TO PRECONSTRUCTION CONDITION INCLUDING BUT NOT LIMITED TO ANY DIVOTS OR ROADWAY OR SURROUNDING AREA.
12. DIGITAL PHOTOGRAPHS SHALL BE TAKEN OF SITE ACCESS, COMPOUND AND TOWER PRIOR TO CONSTRUCTION, DURING CONSTRUCTION AND POST CONSTRUCTION INCLUDING BUT NOT LIMITED TO ALL REINFORCED AREAS. CLOSE-OUT REPORT SHALL FOLLOW WITHIN 3 BUSINESS DAYS.

PARTS / FABRICATION / SHOP DRAWINGS:

1. ALL PARTS INCLUDED IN THESE DRAWINGS ARE MANUFACTURED AND OR SUPPLIED BY STRUCTURAL COMPONENTS, LLC. PARTS FROM OTHER MANUFACTURERS ARE NOT TO BE USED UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER OF RECORD.
2. ALL FABRICATION / SHOP DRAWINGS ARE TO BE REVIEWED FOR COMPLIANCE TO THE STRUCTURAL DRAWINGS AND SIGNED OFF BY THE STRUCTURAL ENGINEER PRIOR TO FABRICATION.

EARTHWORK:

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED FOUNDATION WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PROVIDE SHORING AND BRACING AS MAY BE REQUIRED DURING CONSTRUCTION TO ACHIEVE THE FINAL COMPLETED STRUCTURE.
3. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE SHORING AND BRACING ELEMENTS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
5. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

FOUNDATION DESIGN:

1. REFER TO GEOTECHNICAL REPORT REFERENCED IN PASSING WITH MODIFICATIONS STRUCTURAL FOR SOILS INFORMATION.
2. CONTRACTOR SHALL VERIFY THAT THE SOILS ENCOUNTERED CORRESPOND TO THE GEOTECHNICAL REPORT WHILE EXCAVATING. THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD IF ANY UNEXPECTED SOILS ARE ENCOUNTERED.
3. ALL FILL SHALL BE CLEAN AND FREE OF ORGANIC OR FROZEN SOILS AND FOREIGN MATERIALS. STRUCTURAL BACKFILL SHALL BE COMPACTED IN 12 INCH LOOSE LIFTS TO 97% OF MAXIMUM DRY DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698.
4. LOOSE MATERIAL SHALL BE REMOVED FROM BOTTOM OF EXCAVATION PRIOR TO PLACING CONCRETE.
5. CONCRETE SHALL BE PLACED AS SOON AS PRACTICAL AFTER EXCAVATION TO AVOID DISTURBANCE OF BEARING AND SIDE WALL SURFACES.
6. FOLLOW ALL RECOMMENDATIONS IN GEOTECHNICAL REPORT FOR SUB-GRADE PREPARATION UNDER FOUNDATION ELEMENTS.

CAST-IN-PLACE CONCRETE:

1. ALL CONCRETE DESIGN IS BASED ON THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14/318R-14).
2. ALL STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. U.N.O.
3. CONCRETE SHALL BE PROPORTIONED UTILIZING TYPE II CEMENT. CONCRETE SUSCEPTIBLE TO FREEZING SHALL BE FORMULATED FOR MAXIMUM FROST RESISTANCE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE.
4. COLD WEATHER AND/OR HOT WEATHER CONCRETING PROCEDURES SHALL BE PROVIDED, IF CONDITIONS WARRANT, AS RECOMMENDED IN THE ACI MANUAL OF CONCRETE PRACTICE.
5. ALL ANCHOR BOLTS IN NEW FOUNDATIONS SHALL BE PLACED WITH SETTING TEMPLATES.

REINFORCING STEEL:

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE.
2. REINFORCING BARS SHALL BE DEFORMED AND CONFORM TO ASTM A615-79 AND SHALL BE GRADE 60, EXCEPT TIES WHICH MAY BE GRADE 40.
3. AT REINFORCING STEEL SPLICES IN CONCRETE, LAP BARS 40 DIAMETERS FOR SIZES UNDER #7 AND 48 DIAMETERS FOR SIZES #7 AND LARGER U.N.O.
4. EXCEPT AS NOTED ON THE DRAWINGS, MINIMUM CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 318-14/318R-14.
5. NO.5 OR LARGER REINFORCING BARS SHALL NOT BE RE-BENT WITHOUT APPROVAL BY THE STRUCTURAL ENGINEER.
6. WELDING OF REBAR IS STRICTLY PROHIBITED.

BACKFILLING:

1. BACKFILLING OF SOILS AROUND FOUNDATION BASES / ANCHORS SHALL BE COMPLETED BEFORE ERECTION OF TOWER BEGINS.
2. BACKFILL SHALL BE COMPACTED IN LIFTS TO 90% COMPACTION.
3. BACKFILL SHALL BE NATIVE SOILS; IMPORTED FILL SHALL BE VERIFIED WITH THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER PRIOR TO BACKFILLING.

STRUCTURAL STEEL:

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH 2010 AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, 2010 AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AND CHAPTER 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES (SEE FABRICATION DRAWINGS FOR SPECIFIC GRADES FOR SPECIFIC PARTS):
   - CHANNELS, SOLID ROUND, & ANGLES ——— ASTM A36, (FY = 36 KSI)
   - PLATES ——— A572 GR. 50, (FY = 50 KSI)
   - HSS ——— ASTM A500 GR. B, (FY = 46 KSI)
   - STEEL PIPE ——— ASTM A53 GR. B, (FY = 35 KSI)
   - U-BOLTS ——— ASTM A307, (FY = 36 KSI) w/ LOCKING DEVICE U.N.O.
   - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS AS PER THE TIA CODE:
   - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
   - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
   - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
   - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH.

CORROSION CONTROL:

1. ALL STEEL MEMBERS SHALL HAVE CORROSION CONTROL AS OUTLINED IN THE TIA CODE AND STATED BELOW:
   - STEEL MEMBERS SHALL BE HOT DIPPED GALVANIZED PER ASTM A123.
   - FASTENERS AND HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A153 OR ASTM B695 CLASS 50 (A490 BOLTS SHALL NOT BE HOT DIPPED GALVANIZED).
   - GUYS STANDS SHALL BE PROTECTED IN ACCORDANCE WITH ASTM A475 OR AS86 MINIMUM CLASS A COATING.
   - GUY ANCHORAGE IN DIRECT CONTACT OF GROUND SHALL BE HOT DIPPED GALVANIZED PER ASTM A123.
   - ALL REPAIRS SHALL BE PROTECTED IN ACCORDANCE WITH ASTM A780.
2. ALL FIELD CUT SURFACES SHALL BE REPAIRED WITH (2) COATS OF A 93% ZINC RICH PAINT PER ASTM A780 (ZRC PREFERRED).
3. ALL DAMAGED SURFACES, WELDED AREAS AND AUTHORIZED NON-GALVANIZED MEMBERS OR PARTS (EXISTING OR NEW) SHALL BE PAINTED WITH (2) COATS OF ZINC RICH PAINT (ZRC PREFERRED).
4. GUY ANCHOR GALVANIZATION SHALL EXTEND A MIN OF 6" INTO CONCRETE.

BOLTS:

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED IN SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES.
3. ALL BOLTS WITHOUT DTI WASHERS SHALL BE INSTALLED SNUG FIT UNTIL THE SECTION IS FULLY COMPACTED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT", TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG FIT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1/2 TURN BEYOND SNUG FIT.
5. FOR SITES WITH DTI WASHERS, REFER TO MANUFACTURER'S RECOMMENDED CALIBRATION PROCEDURE. HTTP://WWW.APPLIEDBOLTING.COM/PDF/SQUIRT_INSTALL.PDF
   - CHECK THE FIRST SET OF BOLTS WITH THE RECOMMENDED FEELER GAUGE TO VERIFY THE PROPER AMOUNT OF "SQUIRT".
   - FOR THE REMAINING BOLTS WITH DTI WASHERS, TIGHTEN UNTIL THE VOLUME AND APPEARANCE OF THE SQUIRT MATCHES THE FIRST "CALIBRATION" SET. THE NUMBER OF SQUIRTS MUST BE AT LEAST THE NUMBER OF BUMPS MINUS ONE. (FOR INSTANCE A FIVE BUMP DTI SHOULD SQUIRT IN AT LEAST FOUR PLACES).
   - PROVIDE OF THE FULLY ENGAGED SQUIRTER DTI WASHERS MUST BE TAKEN WITHIN 24 HOURS OF INSTALLATION BY THE CONTRACTOR.
6. FOR SETS OF BOLT, TIGHTEN GROUP INCREMENTALLY. COMPRESS ALL UNTIL MEMBERS ARE IN FIRM CONTACT. THEN COMPLETE FINAL BOLT TENSIONING.

WELDS:

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH AISC AND AWS WELDING CODE - STEEL, AWS D1.1/D1.1M:2008 SPECIFICATIONS AND RECOMMENDATIONS.
2. ALL FIELD WELDS SHALL BE PERFORMED BY SMAW OR FCAW PROCESSES ONLY AND USE THE FOLLOWING ELECTRODE SPECIFICATIONS:
   - FILLER METAL YIELD <= 55 KSI
     - SMAC - 7013-X, 7016-X, 7018-X, OR 7028-X
     - FCAW - E7XT-X, OR E7XT-X4
   - FILLER METAL YIELD > 55 KSI
     - SMAC - 8013-X, 8016-X OR 8018-X
     - FCAW - E8XT-X, AND E8XTX-X4
   - ALL FILLER METAL IS ASSUMED TO BE <= 55 KSI UNLESS WELD CALLOUT SPECIFIES OTHERWISE
   - ALL FCAW WIRE MUST BE SELF-SHIELDED
3. REFER TO STRUCTURAL DRAWINGS FOR ALL FIELD WELD SIZES AND TYPES.
4. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES.
5. REFER TO A DETAILED WELDING SPECIFICATION AND GUIDELINE BY STRUCTURAL COMPONENTS PRIOR TO COMMENCEMENT OF WORK.
6. CONTRACTOR RESPONSIBLE FOR PROTECTING NEARBY COMBUSTIBLE MATERIALS FROM HEAT, FLAME, SPARKS, AND SLAG BY MOVING OR COVERING THEM.
7. FIRE WATCH MUST REMAIN IN THE WORK AREA 30 MINUTES MINIMUM AFTER WELDING OR CUTTING OPERATIONS HAVE ENDED.

GUY ASSEMBLIES:

1. ALL GUY ASSEMBLIES AND COMPONENTS SHALL HAVE THE MINIMUM DESIGN STRENGTHS AS SHOWN ON THE STRUCTURAL DRAWINGS.
2. GUY STRANDS SHALL BE EXTRA HIGH STRENGTH (EHS) OR EQUAL AND SHALL BE IN ACCORDANCE WITH ASTM A475.
3. STRUCTURAL STRANDS SHALL BE IN ACCORDANCE WITH ASTM A586 OR EQUAL.
4. GUY GRIPS SHALL BE DESIGNED SPECIFICALLY FOR THE FULL STRENGTH OF THE GUY WIRES THEY ARE BEING USED FOR.
5. SOCKETS SHALL BE IN ACCORDANCE WITH ASTM A27 AND A148.
6. ZINC POURED ATTACHMENTS SHALL BE IN ACCORDANCE WITH ASTM B6.
7. SHACKLES AND TURNBUCKLES SHALL BE FORGED FROM AISI GRADE 1035 OR 1045 STEEL OR EQUIVALENT.
8. INITIAL TENSION OF GUYS SHALL BE AS STATED ON THE STRUCTURAL DRAWINGS.
9. TURNBUCKLE LOCKS SHALL BE INSTALLED AND SECURELY FIXED THROUGH ALL TURNBUCKLES.
10. FACTORY INSTALLED COMPONENTS SHALL BE PROOF LOADED, PRE-STRESSED AND HAVE LENGTH MEASUREMENTS CHECKED IN ACCORDANCE WITH CHAPTER 9 OF THE TIA CODE.
11. THE MAXIMUM DEVIATION FOR THE DESIGN INITIAL TENSION SHALL BE 10% FOR GUYS UP TO AND INCLUDING 1" DIAMETER OF THE SPECIFIED DESIGN INITIAL TENSION AT AN ANCHORAGE, CORRECTED FOR AMBIENT TEMPERATURE.
12. THE MAXIMUM DEVIATION FOR THE DESIGN INITIAL TENSION SHALL BE 5% FOR GUYS GREATER THAN 1" DIAMETER OF THE SPECIFIED DESIGN INITIAL TENSION AT AN ANCHORAGE, CORRECTED FOR AMBIENT TEMPERATURE.
13. FOR NEWLY INSTALLED GUY WIRES FINAL TURNBUCKLE GAPS MUST ALLOW FOR 3" OF ADJUSTMENT IN EITHER DIRECTION. FOR EXAMPLE, A 12" TURNBUCKLE SHALL HAVE A RANGE BETWEEN 3" AND 9".

TOLERANCES:

1. CONSTRUCTION OF TOWERS SHALL MEET ALL OF THE TOLERANCE REQUIREMENTS AS OUTLINED IN CHAPTER 6.1.2 OF THE TIA CODE.

GROUT:

1. ALL GROUT BENEATH BASE PLATES SHALL BE NON-SHRINK, "EMBECO","FIVE-STAR" OR EQUAL.
2. ALL GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI. U.N.O.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS:

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PROVIDE TEMPORARY BRACING AS MAY BE REQUIRED DURING CONSTRUCTION TO ACHIEVE THE FINAL COMPLETED STRUCTURE.
3. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE BRACING ELEMENTS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
5. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

PAINT:

1. AS NOTED IN DRAWINGS, CLEAN AND PAINT PROPOSED STEEL ACCORDING TO FAA ADVISORY CIRCULAR AC 70/7460-1K.

PROTECTIVE GROUNDING:

1. GROUNDING OF THE TOWER SHALL BE IN ACCORDANCE WITH SECTION 10 OF THE TIA-222-H CODE WITH THE FOLLOWING EXCEPTIONS:
   - NO TESTING TO VERIFY FINAL RESISTANCE WILL BE COMPLETED UNLESS SPECIFICALLY REQUESTED BY CLIENT AND NOTED IN THE DRAWINGS.
   - ALTERNATIVE GROUNDING METHODS FOR SITE SPECIFIC CONDITIONS DESIGNED IN ACCORDANCE WITH MOTOROLA R56 "STANDARDS AND GUIDELINES FOR COMMUNICATION SITES" MAY BE APPROVED BY THE ENGINEER OF RECORD AND PRESENTED IN THE DRAWINGS.

MAPPING:

1. FIELD MAPPING SHALL BE IN ACCORDANCE WITH CHAPTER 14 OF THE TIA CODE.
2. CONTRACTOR SHALL THOROUGHLY INSPECT AND SURVEY EXISTING STRUCTURE TO VERIFY DIMENSIONS, ELEVATIONS, FRAMING, ETC. WHICH AFFECT THE WORK SHOWN ON THE DRAWINGS.
3. REPORT ANY VARIATIONS OR DISCREPANCIES TO THE STRUCTURAL ENGINEER BEFORE PROCEEDING.

MAINTENANCE:

1. A CONTINUOUS INSPECTION OF THE STRUCTURE SHALL BE COMPLETED PER TIA RECOMMENDATIONS AS OUTLINED IN CHAPTER 14 OF THE TIA CODE. ANY DEFECTS SHALL BE REPORTED TO ENSURE THE STRUCTURAL INTEGRITY FOR THE LIFE OF THE STRUCTURE.

AJAX BOLTS:

1. AJAX BOLTS USED FOR STRUCTURAL CONNECTIONS SHALL BE AJAX 'ONESIDE' PCB.B W/ SLEEVE AND SHALL BE THE SIZE AS SPECIFIED ON THE STRUCTURAL DRAWINGS.
2. ALL AJAX BOLTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS AND DETAILS SHOWN IN DRAWINGS.
3. ALL AJAX BOLTS SHALL RUST PROOF GALVANIZED.
4. AJAX BOLTS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES.

THREADED REBAR:

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF THREADED REBAR REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
2. THREADED REBAR SHALL BE DEFORMED AND CONFORM TO THE FOLLOWING MINIMUM GRADES:
   - GRADE 75 ——— ASTM A615, (FY = 75 KSI, Fu = 100 KSI)
   - GRADE 90 ——— ASTM A615, (FY = 90 KSI, Fu = 100 KSI)
   - 150 KSI ——— ASTM A722, (FY = 127.5 KSI, Fu = 150 KSI)
3. THREADED REBAR SHALL HAVE A MINIMUM SIZE EQUAL TO THE SIZE AS INDICATED ON THE STRUCTURAL DRAWINGS.
4. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY THE SAME MANUFACTURER AS THE REINFORCING BARS. (SEE BELOW)
5. ALL BARS AND PARTS ARE TO BE HOT DIPPED GALVANIZED.
6. WELDING OF ALL-THREAD BARS IS STRICTLY PROHIBITED.

DYWIDAG THREADBAR REINFORCING BAR ATTACHMENTS:

1. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH DYWIDAG REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY DYWIDAG-SYSTEMS INTERNATIONAL.
2. ANCHOR BOLTS ARE TO BE ASTM A615 FOR ALL ALL-THREAD REINFORCING BAR GRADES EXCEPT FOR 150 KSI WHICH SHALL BE ASTM A722.
3. HEX NUTS AND JAM NUTS ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES
4. HARDENED WASHERS ARE TO BE ASTM A436 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
5. COUPLERS SHALL BE 'STOP-TYPE COUPLING AND ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.

WILLIAMS FORM ALL-THREAD REINFORCING BAR ATTACHMENTS:

1. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH WILLIAMS FORM ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY WILLIAMS FORM ENGINEERING CORP.
2. ANCHOR BOLTS ARE TO BE ASTM A615 FOR ALL ALL-THREAD REINFORCING BAR GRADES EXCEPT FOR 150 KSI WHICH SHALL BE ASTM A722.
3. HEX NUTS AND JAM NUTS ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES
4. HARDENED WASHERS ARE TO BE ASTM F436 FOR ALL ALL-THREAD REINFORCING BAR GRADES.
5. COUPLERS SHALL BE 'STOP-TYPE COUPLING AND ARE TO BE ASTM A108 FOR ALL ALL-THREAD REINFORCING BAR GRADES.

THREADED REBAR (VGX REINFORCING RODS):

1. ALL DETAILING, FABRICATION, AND PLACEMENT OF THREADED REBAR REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
2. THREADED REBAR SHALL BE DEFORMED AND CONFORM TO THE FOLLOWING MINIMUM GRADES:
   - GRADE 75 ——— ASTM A615, (FY = 75 KSI, Fu = 100 KSI)
   - GRADE 90 ——— ASTM A615, (FY = 90 KSI, Fu = 100 KSI)
   - GRADE 150 ——— ASTM A722, (FY = 127.5 KSI, Fu = 150 KSI)
3. THREADED REBAR SHALL HAVE A MINIMUM SIZE EQUAL TO THE SIZE AS INDICATED ON THE STRUCTURAL DRAWINGS.
4. ALL COUPLERS, NUTS AND LOCK NUTS USED WITH ALL-THREAD REINFORCING BARS SHALL BE OF THE APPROPRIATE SIZE AND PITCH TO MATCH THE CORRESPONDING BAR SIZE AND SHALL BE MANUFACTURED BY THE SAME MANUFACTURER AS THE REINFORCING BARS. (SEE BELOW)
5. ALL BARS AND PARTS ARE TO BE HOT DIPPED GALVANIZED.
6. WELDING OF ALL-THREAD BARS IS STRICTLY PROHIBITED.
7. ALL VGX REINFORCING RODS AND HELICAL ANCHORS SHALL BE PROOF LOADED TO THE LOADS AS SHOWN BELOW. INCREASE LOADS ON EACH ANCHOR AROUND THE POLE IN INCREMENTS OF 10 KIPS UNTIL PROOF LOAD ON ALL ANCHORS IS MET.
   - #14 GRADE 75 ——— 70 KIPS
   - #11 GRADE 75 ——— 50 KIPS
   - #11 GRADE 90 ——— 60 KIPS
   - #11 150 KSI ——— 70 KIPS
8. PRE-TENSIONING OF VGX REINFORCING RODS SHALL BE PROVIDED AFTER ALL PROOF LOADS HAVE BEEN APPLIED. PRE-TENSION LOADS ARE AS FOLLOWS:
   - #14 GRADE 75 ——— 11.2 KIPS
   - #11 GRADE 75 ——— 7.8 KIPS
   - #11 GRADE 90 ——— 9.4 KIPS
   - #11 150 KSI ——— 11.2 KIPS

HELICAL PIERS (BY OTHERS):

1. HELICAL PIERS SHALL BE DESIGNED FOR A VERTICAL LOAD AND A HORIZONTAL LOAD AS DETAILED IN THE PASSING WITH MODIFICATIONS STRUCTURAL ANALYSIS.
2. HELICAL PIERS SHALL BE INSTALLED TO HAVE A MINIMUM FACTOR OF SAFETY OF 1.5.
3. ALL HELICAL PIERS AND CONNECTIONS TO RVG BASE TERMINATION SHALL BE DESIGNED BY THE HELICAL PIER SUPPLIER, SUCH THAT THEY PROVIDE THE MINIMUM ALLOWABLE CAPACITIES AS INDICATED ON THE DRAWINGS. DESIGN SHALL BE SEALED BY A LICENSED PROFESSIONAL ENGINEER.
4. REFER TO GEOTECHNICAL REPORT REFERENCED IN PASSING WITH MODIFICATIONS STRUCTURAL FOR SOILS INFORMATION.
5. ALL STEEL FOR HELICAL PIERS SHALL BE HOT-DIP GALVANIZED.
6. HELICAL PIERS SHALL BE INSTALLED TO THE MANUFACTURERS SPECIFICATIONS. DOCUMENTATION OF THE INSTALLED CAPACITIES SHALL BE FURNISHED TO THE STRUCTURAL ENGINEER AFTER INSTALLATION IS COMPLETE.

REINFORCEMENT REQUIREMENTS OF EXISTING STRUCTURES:

1. ALL MODIFICATIONS AND REINFORCEMENTS TO THE STRUCTURE ARE BASED ON A RIGOROUS STRUCTURAL ANALYSIS.
2. ALL ADDED STRUCTURAL COMPONENTS HAVE BEEN DESIGN IN ACCORDANCE WITH THE CODES AS STATED ABOVE.
3. ALL ASSUMPTIONS MADE SHALL BE VERIFIED WITH THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.

ANCHOR REINFORCEMENT INSTALLATION:

1. CONTRACTOR SHALL VERIFY THAT DRILLING CLEARANCE AT POLE AND ACCESS IS SATISFACTORY PRIOR TO CONSTRUCTION. ANY OBSTACLES SHALL BE REPORTED IMMEDIATELY TO ENGINEER.
2. DRILL HOLES SHALL BE LOCATED FAR ENOUGH INSIDE THE EDGE OF CAISSON OR PIER TO AVOID REBAR CAGE. DISTANCE SHOWN IN DRAWINGS.
3. COMPRESSED AIR SHALL BE USED TO BLOW DEBRIS OUT OF THE NEWLY DRILLED HOLES.
4. HOLES IN BASEPLATE ARE PREFERABLY DRILLED. IF HOLES IN BASEPLATE ARE TORCHED, EDGES SHALL BE GROUND SMOOTH AND REPAINED ACCORDING TO "CORROSION CONTROL" SECTION.
5. PHOTOS SHALL BE TAKEN OF EACH HOLE WITH A TAPE MEASURE INSERTED TO SHOW ACTUAL DEPTH OF HOLE. HOLES SHALL BE NUMBERED WITH A MARKER PER DRAWINGS FOR REFERENCE.
6. HILTI RE 150 EPOXY SHALL BE USED TO SET ANCHORS. ALTERNATIVE EPOXY MAY BE APPROVED BY ENGINEER OF RECORD IF REQUESTED. FOLLOW MANUFACTURERS INSTRUCTIONS.
7. AFTER EPOXY HAS CURED FOR A MINIMUM OF 24 HOURS, TOP OFF HOLE WITH ADDITIONAL EPOXY TO CROWN OVER CONCRETE AND ENSURE THAT THERE WILL BE NO WATER RETENTION AROUND ANCHOR ROD.

BLUE SKY TOWERS LLC

Structural Components
Bringing It All Together

1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
5					
4					
3					
2					
1					
0	4/28/23	MODIFICATION DRAWINGS	RM	TR	WC

SITE INFORMATION:

97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:

SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:

GENERAL
CONSTRUCTION NOTES

SHEET NUMBER	REVISION
GN-1	0

1. **GENERAL INSPECTION NOTES:**
   a. THE CONSTRUCTION OF THE PROPOSED STRUCTURAL ELEMENTS SHOWN IN THESE DRAWINGS SHALL NOT BE CONSIDERED AS COMPLETE UNTIL THE SPECIAL INSPECTIONS AND STRUCTURAL OBSERVATIONS MARKED IN THE FOLLOWING TABLES HAVE BEEN REVIEWED AND APPROVED BY THE ENGINEER OF RECORD (EOR) AND SUBMITTED TO THE BUILDING OFFICIAL.
   b. THIS SPECIAL INSPECTION PROGRAM DOES NOT RELIEVE THE CONTRACTOR OF HIS OR HER RESPONSIBILITIES.
   c. THE QUALIFICATIONS OF ALL SPECIAL INSPECTORS MUST BE SUBMITTED TO THE EOR FOR REVIEW AND APPROVAL.
   d. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL INSPECTORS SUCH THAT WORK MAY BE INSPECTED AT APPROPRIATE TIMES.
   e. THE EOR OR PERSONNEL WORKING UNDER THE DIRECTION OF THE EOR MAY BE CONTRACTED TO COMPLETE THE SPECIAL INSPECTIONS.
   f. ANY CHANGES NOTED DURING THE INSPECTIONS MUST BE REVIEWED AND APPROVED BY THE EOR.
   g. THE GENERAL CONTRACTOR SHALL PROVIDE AN AS-BUILT SET OF PLANS TO THE EOR DOCUMENTING ALL CHANGES THAT OCCURRED DURING CONSTRUCTION.
   h. REFER TO THE NOTES THAT ACCOMPANY EACH TABLE FOR SPECIFICS ON REQUIRED INSPECTIONS

2. **DUTIES OF THE SPECIAL INSPECTOR:**
   a. ANY CHANGES NOTED DURING THE INSPECTION MUST BE REVIEWED AND APPROVED BY THE EOR.
   b. THE INSPECTOR SHALL OBSERVE THE WORK FOR COMPLIANCE WITH THE JURISDICTION APPROVED PLANS, SPECIFICATIONS AND APPLICABLE PROVISIONS OF THE IBC. SHOP DRAWINGS MAY BE USED ONLY AS AN AID TO INSPECTIONS.
   c. CONTINUOUS SPECIAL INSPECTIONS REQUIRE FULL-TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED.
   d. PERIODIC SPECIAL INSPECTIONS REQUIRE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK.
   e. THE INSPECTOR SHALL BRING NON-CONFORMING ITEMS TO THE IMMEDIATE ATTENTION OF THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL BRING ALL NON-CONFORMING ITEMS TO THE IMMEDIATE ATTENTION OF THE EOR. IF ANY ITEM IS NOT RESOLVED IN A TIMELY MANNER AND IS ABOUT TO BE INCORPORATED IN THE WORK, THE SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY THE EOR.
   f. ALL NON-CONFORMING ITEMS, EVEN IF CORRECTED, SHALL BE DESCRIBED ON AN ASCE DAILY REPORT FORM AND ON AN ASCE DISCREPANCY NOTICE FORM.
   g. THE SPECIAL INSPECTOR SHALL COMPLETE AN ASCE DAILY REPORT FORM, AN INTERIM REPORT FORM AND/OR A DISCREPANCY NOTICE FORM FOR EACH DAY'S INSPECTIONS. FORMS CAN BE OBTAINED UPON REQUEST FROM THE EOR.
   h. THE SPECIAL INSPECTOR OR INSPECTION AGENCY SHALL SUBMIT FINAL SIGNED REPORTS TO THE EOR.

3. **REQUIREMENTS FOR STRUCTURAL OBSERVATION:**
   STRUCTURES MEETING THE FOLLOWING CRITERIA ARE REQUIRED TO HAVE SPECIAL INSPECTIONS CONDUCTED BY REGISTERED PROFESSIONAL ENGINEERS:
   - THE STRUCTURE IS CLASSIFIED AS RISK CATEGORY IV
   - $V_{ULT} \geq$ 130 MPH AND THE FOLLOWING CRITERIA:
     - RISK CATEGORY III OR IV.
   - SEISMIC DESIGN CATEGORY D, E OR F AND THE FOLLOWING CRITERIA:
     - RISK CATEGORY III OR IV
   - SEISMIC DESIGN CATEGORY E AND THE FOLLOWING CRITERIA:
     - RISK CATEGORY I OR II
     - THE STRUCTURE IS GREATER THAN TWO STORIES ABOVE THE GRADE PLANE

   THE FOLLOWING ARE EXCEPTIONS TO THESE REQUIREMENTS:
   - STRUCTURAL STEEL (CONCRETE NOT EXCEPTED) DESIGNED FOR SEISMIC DESIGN CATEGORY B OR C THAT WAS NOT SPECIFICALLY DESIGNED FOR SEISMIC RESISTANCE AND HAS A RESPONSE MODIFICATION FACTOR OF 3 OR LESS (EXCLUDING CANTILEVERED COLUMNS SYSTEMS).
   - FOUNDATION MODIFICATIONS OR TOWER MODIFICATIONS DESIGNED FOR SEISMIC CATEGORY D, E OR F WHERE THE ORIGINAL TOWER OR FOUNDATION IS CAPABLE OF WITHSTANDING SEISMIC LOADS WITHOUT CONSIDERING REINFORCEMENTS.

4. **REFERENCED STANDARDS:**
   a. ACI 318-14
   b. AISC 360-16 AND AISC 303-10 IN ACCORDANCE WITH AISC FIFTEENTH EDITION
   c. AWS D1.1 – 15, D1.3 – 08, D1.4 – 17
   d. ASTM C 31/C 31M – 15, ASTM C 172/C 172M – 14a

5. **SOILS AND EARTHWORK INSPECTION NOTES:**
   a. THE FINAL DEPTH AND SOIL CONDITION SHALL BE INSPECTED PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE. THIS SHALL INCLUDE VERIFYING THAT THE SOIL TYPE AND MATERIAL MATCHES THE GEOTECHNICAL REPORT REFERENCED IN THE PASSING WITH MODIFICATIONS ANALYSIS. IF THERE IS ANY DOUBT TO SOIL CONDITION/TYPE THEN ADDITIONAL TESTING MAY BE REQUIRED TO VERIFY DESIGN BEARING CAPACITY. CONTACT THE EOR WITH ANY OBSERVED ISSUES.
   b. THE BOTTOM OF EXCAVATION SHALL BE INSPECTED TO ENSURE THAT NO EXCESS LOOSE OR FOREIGN MATERIALS ARE PRESENT.
   c. THE DENSITY AND LIFT THICKNESS SHALL BE CONTINUOUSLY MONITORED DURING BACKFILL TO MATCH RECOMMENDATIONS IN GEOTECHNICAL REPORT. IF NO RECOMMENDATIONS ARE LISTED, THE BACKFILL SHALL BE PERFORMED IN 9-12" HORIZONTAL LIFTS TO NOT LESS THAN 90% OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT DETERMINED IN ACCORDANCE WITH ASTM 1557. THE FILL SHALL BE FREE FROM LARGE ROCKS, WASTE AND DEBRIS.

6. **REBAR INSPECTION NOTES:**
   a. ALL REBAR PARTS LISTS, INCLUDING MATERIAL SPECIFICATIONS, MUST BE MAINTAINED AND PROVIDED TO THE EOR.
   b. ALL REBAR MUST BE INSPECTED BEFORE CONCRETE IS POURED INCLUDING BUT NOT LIMITED TO PLACEMENT, SIZES, BEND DIAMETERS, SPACING, LAP DISTANCES, CLEAR COVER AND TIES.
   c. ANY EMBEDDED DOWELS SET WITH EPOXY OR GROUT MUST BE INSPECTED BEFORE CONCRETE IS POURED. THIS INCLUDES FINAL DEPTH AND HOLE DIAMETER, HOLE DRILLING AND CLEANING PROCEDURES. THE EPOXY OR GROUT APPLICATION MUST BE INSPECTED AND VERIFIED TO FOLLOW MANUFACTURER'S RECOMMENDATIONS. HORIZONTAL OR UPWARD SLOPING PLACEMENT OF DOWELS WITH EPOXY MUST BE CONTINUOUSLY MONITORED.
   d. ANY CONDUITS OR OTHER ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE INSPECTED TO CONFORM WITH ACI 318: 6.3.

7. **CONCRETE INSPECTION NOTES:**
   a. BATCH DESIGN MIX RECORDS MUST BE RETAINED AND PROVIDED TO THE EOR.
   b. AT LEAST 5 TEST CYLINDERS MUST BE TAKEN PER TRUCK IN ACCORDANCE WITH ASTM D3666.
   c. SLUMP, AIR CONTENT AND TEMPERATURE TESTS MUST BE COMPLETED AT THE TIME THAT TEST CYLINDERS ARE TAKEN. THIS INFORMATION SHALL BE DOCUMENTED WITH THE STRENGTH TESTS.
   d. ALL TEST CYLINDERS MUST BE CURED ON SITE AT IDENTICAL CONDITIONS AS TESTED CONCRETE.
   e. IF ANY COLD WEATHER, HOT WEATHER OR ACCELERATE CURING METHODS ARE USED, THESE PROCEDURES AND MATERIALS MUST BE DOCUMENTED.
   f. FINAL BREAK TESTS MUST BE COMPLETED AND PASS REQUIREMENTS IN ACI 318: 5.6.3.3 BEFORE NEW CONCRETE CAN BE LOADED.

8. **ANCHOR ROD AND EMBEDMENT INSPECTION NOTES:**
   a. FOR EMBEDMENTS SET IN UNCURED CONCRETE, THE SPECIAL INSPECTOR SHALL VERIFY THAT THE EMBEDMENT MATCHES THE DRAWINGS FOR GEOMETRY, ELEVATION AND LOCATION.
   b. FOR EMBEDMENTS SET IN HARDENED CONCRETE, THE HOLE DIAMETER(S) AND DEPTH(S) MUST BE INSPECTED BY THE SPECIAL INSPECTOR PRIOR TO SETTING THE EMBEDMENT. THE TECHNIQUE FOR DRILLING OR CORING AND CLEANING MUST BE DOCUMENTED BY THE SPECIAL INSPECTOR AND CONFIRMED TO MATCH DRAWINGS. GROUT OR EPOXY PRODUCTS AND VOLUMES MUST BE RECORDED BY THE SPECIAL INSPECTOR ON A PER HOLE BASIS.
   c. VERTICALLY ORIENTATED EMBEDMENTS MUST BE PERIODICALLY MONITORED DURING INSTALLATION FOR ELEVATION AND TO VERIFY THE PROCEDURES MATCH MANUFACTURER'S RECOMMENDATIONS.
   d. HORIZONTAL AND UPWARDLY SLOPING EMBEDMENTS MUST BE CONTINUOUSLY INSPECTED DURING ALL INSTALLATION ACTIVITIES TO VERIFY THE PROCEDURES MATCH MANUFACTURER'S RECOMMENDATIONS.

9. **STRUCTURAL STEEL SHOP FABRICATION INSPECTION NOTES:**
   a. SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY EOR PRIOR TO FABRICATION OF PARTS.
   b. ALL BOLT MATERIAL SPECIFICATIONS MUST BE MAINTAINED FROM MANUFACTURER PROVIDED TO THE EOR.
   c. ALL SHOP WELDING SHALL BE INSPECTED AND APPROVED BY A CERTIFIED WELDING INSPECTOR IN ACCORDANCE WITH AWS D1.1.
   d. ALL WELDING MATERIAL SPECIFICATIONS MUST BE MAINTAINED FROM MANUFACTURER PROVIDED TO THE EOR.

10. **STRUCTURAL STEEL FIELD FABRICATION INSPECTION NOTES:**
    a. FOR DTI WASHERS "LOT" CALIBRATION DETAILS MUST BE PROVIDED TO THE EOR. ALL DTI WASHERS INSTALLED MUST BE INSPECTED TO DETERMINE THEY HAVE MET THE TENSIONING SPECIFIED BY THE "LOT" CALIBRATION DETAILS.
    b. FOR ANY OTHER DIRECT TENSION INDICATORS USED, THE CALIBRATION AND INSTALLATION TECHNIQUES MUST BE INSPECTED FOR CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS.
    c. FOR SNUG TIGHT CONNECTIONS ALL PARTS MUST BE INSPECTED TO VERIFY THAT THE CONNECTED MATERIALS HAVE BEEN DRAWN TOGETHER AND PROPERLY SNUGGED. ANY LOCK WASHERS USED MUST BE VERIFIED TO BE FULLY COMPRESSED.
    d. FOR ANY FIELD FABRICATION INCLUDING CUTTING, PUNCHING OR DRILLING, THE FINAL DIMENSIONS MUST BE VERIFIED TO MATCH THE DRAWINGS.
    e. ALL COLD-GALVANIZED SURFACES MUST BE INSPECTED TO HAVE BEEN COATED PROPERLY. A PHOTOGRAPH OF THE COLD-GALVANIZING PRODUCT WITH THE SITE SIGN IS REQUIRED AS PART OF THE INSPECTION RECORDS.

11. **FIELD WELDING INSPECTION NOTES:**
    ALL FIELD WELDS SHALL BE INSPECTED BY A CERTIFIED WELDING INSPECTOR IN ACCORDANCE WITH AWS D1.1. THIS INCLUDES, BUT IS NOT LIMITED TO, FIELD PREPARATION OF AREAS TO BE WELDED, WELDING MATERIALS TO BE USED, WELDING PROCEDURES AND TECHNIQUES, FINAL SIZE AND QUALITY OF WELD AND SURFACE FINISH OF WELDED AREAS.

12. **GUY WIRE TENSION INSPECTION NOTES:**
    a. FINAL GUY WIRE TENSIONS MEASUREMENTS AND TOWER ALIGNMENT MEASUREMENTS MUST BE MADE FOLLOWING ALL GUY WIRE TENSION ADJUSTMENTS.
    b. FINAL GUY WIRE TENSIONS MUST BE DOCUMENTED FOR EACH LEVEL BY CONTRACTOR. THIS SHALL INCLUDE PHOTOS TAKEN WITH TENSION METER OR DIRECT TENSION DEVICE AND WHITE BOARD SHOWING SITE, ANCHOR, GUY LEVEL, TEMPERATURE AND TENSION READING.
    c. CALIBRATION CERTIFICATION OF TENSION METERS SHALL BE PROVIDED TO THE EOR.
    d. FINAL ALIGNMENT OF TOWER SHALL BE MEASURED AND DOCUMENTED BY CONTRACTOR AS SHOWN ON A-1 SHEET. THIS ALIGNMENT SHALL ALSO BE MEASURED AND VERIFIED WITH CLOSEOUT INSPECTION.

SPECIAL INSPECTION CHECKLIST

INSPECTION	DESCRIPTION (SEE ABOVE NOTES)	REQUIRED	RESPONSIBILITY	FREQUENCY
STRUCTURAL OBSERVATION	IBC: 1704.6	NO	SE (RPE)	
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
PERFORM CLASSIFICATION OF COMPACTED FILL MATERIALS	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	PERIODIC
PERFORM TESTING OF COMPACTED FILL MATERIALS	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	CONTINUOUS
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	TA	CONTINUOUS
PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	REFER TO GEOTECHNICAL REPORT IF AVAILABLE	NO	SI	CONTINUOUS
INSPECTION OF REINFORCEMENT, INCLUDING PRE-STRESSING TENDONS, AND VERIFY PLACEMENT	ACI 318: CH 20, 25.2, 25.3, 26.6.1-26.6.3, IBC: 1908.4	NO	SI	PERIODIC
INSPECTION OF REINFORCING STEEL WELDING	AWS D1.4, ACI 318: 26.6.4	NO	CWI	PERIODIC
INSPECTION OF ANCHORS CAST IN CONCRETE	ACI 318: 17.8.2	NO	SI	CONTINUOUS
INSPECTION OF ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	ACI 318: 17.8.2.4	NO	SI	CONTINUOUS
INSPECTION OF MECHANICAL ANCHORS AND ADHESIVE ANCHORS (OTHER ORIENTATIONS OR NOT UNDER SUSTAINED TENSION LOADS)	ACI 318: 17.8.2	NO	SI	PERIODIC
VERIFY MIX DESIGN: A. GC TO PROVIDE MIX DESIGN TO EOR PRIOR TO CONCRETE ORDER FOR REVIEW AND APPROVAL B. EOR TO APPROVE OR REJECT MIX DESIGN	ACI 318: CH 19, 26.4.3, 26.4.4, IBC: 1904.1, 1904.2, 1908.2, 1908.3	NO	GC EOR	PERIODIC
SAMPLING AND TESTING OF FRESH CONCRETE IMMEDIATELY PRIOR TO PLACEMENT FOR SLUMP, AIR AND TEMPERATURE	ASTM C 172, ASTM C 31, ACI 318: 26.5, 26.12, IBC: 1908.10	NO	TA	CONTINUOUS
INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	ACI 318: 26.5, IBC: 1908.6, 1908.7, 1908.8	NO	SI	CONTINUOUS
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURES AND TECHNIQUES	ACI 318: 25.6.3-26.5.5, IBC: 1908.9	NO	SI	PERIODIC
INSPECTION OF PRE-STRESSED CONCRETE FOR APPLICATION OF PRE-STRESSING FORCES AND GROUTING OF BONDED PRE-STRESSING TENDONS	ACI 318: 26.10	NO	SI	CONTINUOUS
INSPECTION OF ERECTION OF PRECAST CONCRETE MEMBERS	ACI 318: 26.9	NO	SI	PERIODIC
VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO LOADING, STRESSING OF TENDONS AND/OR REMOVAL OF FORMS: A. TA TO PROVIDE CONCRETE BREAK TEST(S) TO GC WHEN REQUESTED B. GC TO PROVIDE CONCRETE BREAK TEST(S) TO EOR FOR APPROVAL C. EOR TO APPROVE OR REJECT REQUESTED ACTIONS BASED ON TESTED STRENGTH(S)	ACI 318: 26.11.2	NO	TA GC EOR	PERIODIC
INSPECTION OF FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	ACI 318: 26.11.1.2(f)	NO	SI	PERIODIC
FULL-TESTING OF INSTALLED FOUNDATION SYSTEMS OR EMBEDMENTS: A. SI SHALL CONDUCT TESTING OR OBSERVE TESTING BY OTHERS FOR CONFORMANCE WITH DRAWINGS B. SI SHALL DOCUMENT TEST RESULTS IN A REPORT	REFER TO DRAWINGS	NO	SI	CONTINUOUS
BASE PLATE GROUTING	REFER TO DRAWINGS	NO	SI	PERIODIC
IDENTIFICATION OF HARDWARE MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE ASTM MATERIAL STANDARDS	YES	SI	PERIODIC
HARDWARE MANUFACTURER CERTIFICATE OF COMPLIANCE	—	YES	FAB	PERIODIC
FIELD INSPECTION OF STRUCTURAL STEEL MEMBERS	REFER TO DRAWINGS	NO	SI	PERIODIC
SNUG TIGHT JOINTS	AISC 360, SECTION N5, IBC: 1705.2	YES	SI	PERIODIC
PRE-TENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCH-MARKING, TWIST OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION	AISC 360, SECTION N5, IBC: 1705.2	NO	SI	PERIODIC
PRE-TENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCH-MARKING, OR CALIBRATED WRENCH METHODS OF INSTALLATION	AISC 360, SECTION N5, IBC: 1705.2	NO	SI	PERIODIC
IDENTIFICATION OF STRUCTURAL STEEL MARKINGS TO CONFORM TO AISC 303	AISC 303, SECTION 6.1	NO	SI	CONTINUOUS
IDENTIFICATION OF OTHER STEEL MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE ASTM MATERIAL STANDARDS	YES	FAB	PERIODIC
STRUCTURAL STEEL MANUFACTURER CERTIFIED TEST REPORTS	—	NO	FAB	PERIODIC
WELD FILLER IDENTIFICATION AND MARKING TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS	APPLICABLE AWS STANDARDS	YES	FAB	PERIODIC
WELD FILLER MATERIAL MANUFACTURER CERTIFICATION OF COMPLIANCE	—	NO	CWI	PERIODIC
COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS	AWS D1.1, IBC 1705.2	NO	FAB	PERIODIC
MULTI-PASS FILLET WELDS	AWS D1.1, IBC 1705.2	NO	CWI	CONTINUOUS
SINGLE-PASS FILLET WELDS > 5/16"	AWS D1.1, IBC 1705.2	NO	CWI	CONTINUOUS
PLUG AND SLOT WELDS	AWS D1.1, IBC 1705.2	NO	CWI	CONTINUOUS
SINGLE-PASS FILLET WELDS ≤ 5/16"	AWS D1.1, IBC 1705.2	NO	CWI	CONTINUOUS

TABLE KEY: EOR – ENGINEER OF RECORD; SI – SPECIAL INSPECTOR UNDER CONTRACT WITH GC AND APPROVED BY EOR; RPE – REGISTERED PROFESSIONAL ENGINEER UNDER CONTRACT WITH GC AND APPROVED BY EOR; TA – 3RD PARTY TESTING AGENCY UNDER CONTRACT WITH GC; GC – GENERAL CONTRACTOR; CWI – CERTIFIED WELDING INSPECTOR UNDER CONTRACT WITH GC; FAB – FABRICATOR QA/QC REPRESENTATIVE

BLUE SKY TOWERS LLC

Structural Components

1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

STATE OF CONNECTICUT — MICHAEL T. DE BIASE — No. 18922 — LICENSED PROFESSIONAL ENGINEER

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/23/23	MODIFICATION DRAWINGS	RM	TR	WC
1					
2					
3					
4					
5					

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
SPECIAL INSPECTIONS

SHEET NUMBER: GN-2
REVISION: 0

PORTLAND_CT-1680 (SC Job #230218) BOM

Quantity Required	Quantity Supplied	Elevations	Part Number	Revision	Description	Piece Weight	Total Weight
					SUB-DIAGONAL, SUB-HORIZONTAL, TOP GIRT, & HW		
16	16	0'-0" TO 13'-4"	CP-03102-07	0	3/8" THICK GUSSET PLATE	3.73	59.68
16	16		CP-03102-08	0	1-3/4"x1-3/4"x3/16" LONG SUB-HORIZONTAL	8.01	128.16
16	16		CP-03102-09	0	1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL	11.85	189.60
32	35		HK1-0815-10	0	1/2" x 1-1/2" A325 BOLT HW KIT	0.24	8.40
64	70		HK1-0817-10	0	1/2" x 1-3/4" A325 BOLT HW KIT	0.26	18.20
4	4	20'-0"	CP-03102-10	0	2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT	41.20	164.80
8	9		H01-1015-12	0	5/8" x 1-1/2" A325 BOLT	0.33	2.97
16	18		H01-1017-12	0	5/8" x 1-3/4" A325 BOLT	0.35	6.30
24	27		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	0.81
24	27		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	3.51
					BOLT ON TOWER EXTENSION & HW		
16	16	80'-0"	CP-03102-01	0	EXTENSION - INNER & OUTER LEG SPLICE PLATE	1.97	31.52
8	8	80'-0"	CP-03102-02	0	EXTENSION - LEG SPLICE SHIM PLATE	0.44	3.52
4	4	80'-0" TO 90'-0"	CP-03102-03	0	EXTENSION - LEG	66.00	264.00
16	16	80'-0" TO 90'-0"	CP-03102-04	0	EXTENSION - DIAGONAL	23.92	382.72
4	4	90'-0"	CP-03102-05	0	EXTENSION - TOP GIRT	15.64	62.56
54	60	80'-0" TO 90'-0"	H01-1020-12	0	5/8" x 2" x 1-1/4" A325 BOLT	0.29	17.40
40	45		H01-1017-12	0	5/8" x 1-3/4" x 1-1/4" A325 BOLT	0.26	11.70
94	105		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	3.15
94	105		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	13.65
8	10		H82-0010-02	0	RINGFILL - 5/8" BOLT - 1/4" THICK	0.19	1.90
1	1	90'-0"	H41-0010-06	0	5/8" x 6' LIGHTNING ROD KIT	5.50	5.50
					SAFETY CLIMB & HW		
2	2	90'-0"	CP-03102-06	0	LADDER TOP CONNECTION ANGLE	2.33	4.66
4	5	90'-0"	H01-1017-12	0	5/8" x 1-3/4" x 1-1/4" A325 BOLT	0.26	1.30
4	5		H04-0010-01	0	5/8" HEAVY LOCK WASHER	0.03	0.15
4	5		H02-0010-11	0	5/8"-11 A563DH NUT	0.13	0.65
1	1	79'-0" TO 91'-0"	CW-01133-01	0	12 FT LADDER WELDMENT	76.52	76.52
4	4	79'-0" TO 91'-0"	P597-018-06	0	CLIMBING LADDER BACKING PLATE	0.74	2.96
8	9	79'-0" TO 91'-0"	H26-1085-60	0	3/8" x 3/4" x 8-1/2" x 6" ROUND J-BOLT	0.32	2.88
8	9		H03-0006-02	0	3/8" F436 FLAT WASHER	0.01	0.09
8	9		H04-0006-01	0	3/8" SPRING LOCK WASHER	0.01	0.09
8	9		H02-0006-16	0	3/8"-16 HEAVY HEX NUT	0.04	0.36
1	1	7'-0" TO 57'-0"	H42-130-50	0	AF - 50' SAFETY CLIMB - ROUND & ANGLE LEG - SS - 14RCL50SS	115.00	115.00
1	1	54'-0" TO 91'-0"	H42-130-50	0	AF - 50' SAFETY CLIMB - ROUND & ANGLE LEG - SS - 14RCL50SS	115.00	115.00
1	1	54'-0"	CP-03102-07	0	AF - 2IN TO 4IN ROUND AND ANGLE LEG TERM. BRACKET - 14AFVB1	8.00	8.00
1	1	54'-0"	CP-03102-08	0	AF - SAFETY CLIMB BOTTOM TENSIONER BRACKET - 14AFPMJHB01	4.00	4.00
						TOTAL WEIGHT	1711.71

BLUE SKY TOWERS LLC

Structural Components

1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

STATE OF CONNECTICUT · SHAEL T. DEMPSEY · No. 18012 · LICENSED PROFESSIONAL ENGINEER

REVISIONS:

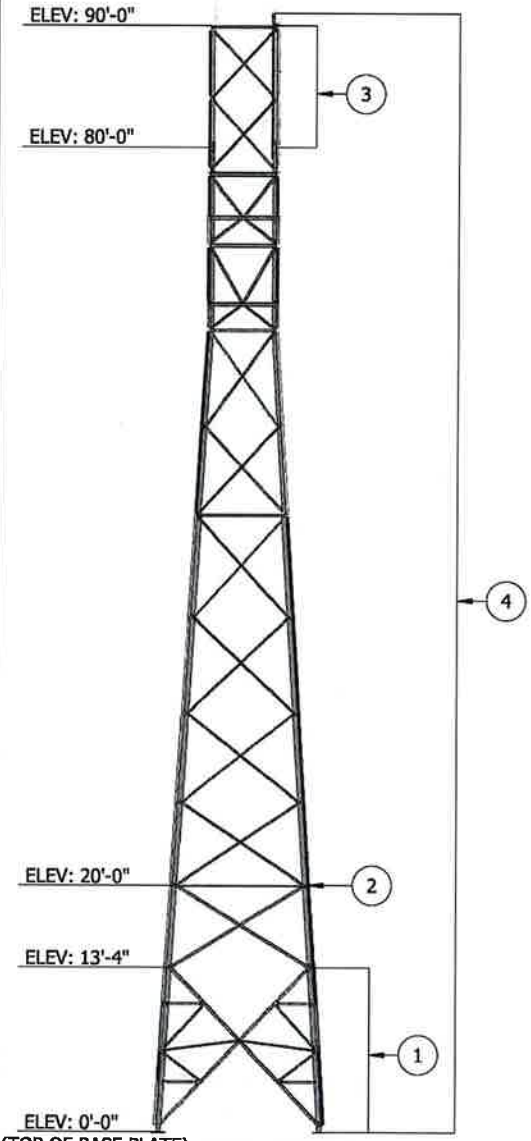
NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
BILL OF MATERIALS

SHEET NO: BOM
REVISION: 0



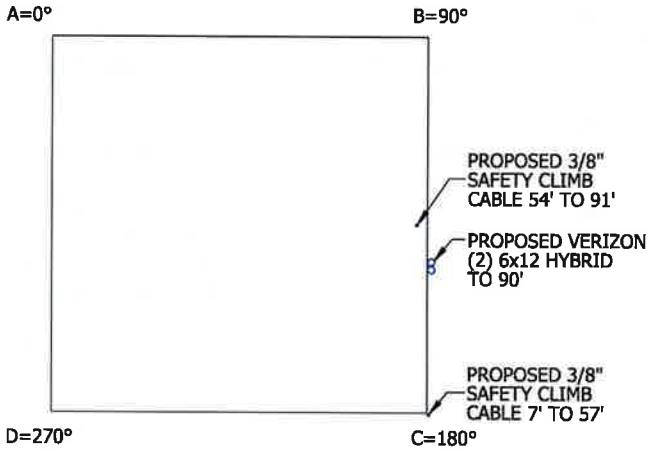
NOTE: ELEVATIONS ARE ROUNDED TO THE NEAREST INCH.

TOWER SPECIFICATIONS	
MANUFACTURER	UNKNOWN
TOWER TYPE / HEIGHT	(4) LEG SELF SUPPORT / 80' TOWER EXTENDED TO 90'

CURRENT STRUCTURAL ANALYSIS	
COMPANY	STRUCTURAL COMPONENTS, LLC
AUTHOR / FILE # / DATE	MICHAEL DEBOER, P.E. / 230218 / 4-20-2023

TOWER MODIFICATION SCHEDULE

ITEM	DESCRIPTION	ELEVATION		DWG. NO.
		BOTTOM	TOP	
1	INSTALL SUB-DIAGONALS AND SUB-HORIZONTALS.	0' - 0"	13' - 4"	D-1
2	UPGRADE TOP GIRT.	20' - 0"	20' - 0"	D-2
3	INSTALL NEW 10 FT TOWER EXTENSION.	80' - 0"	90' - 0"	D-3
4	INSTALL NEW SAFETY CLIMBS.	0' - 0"	91' - 0"	D-4 & D-5



NOTE: ONLY PROPOSED COAX LINES ARE SHOWN.

BLUE SKY TOWERS LLC

Structural Components
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

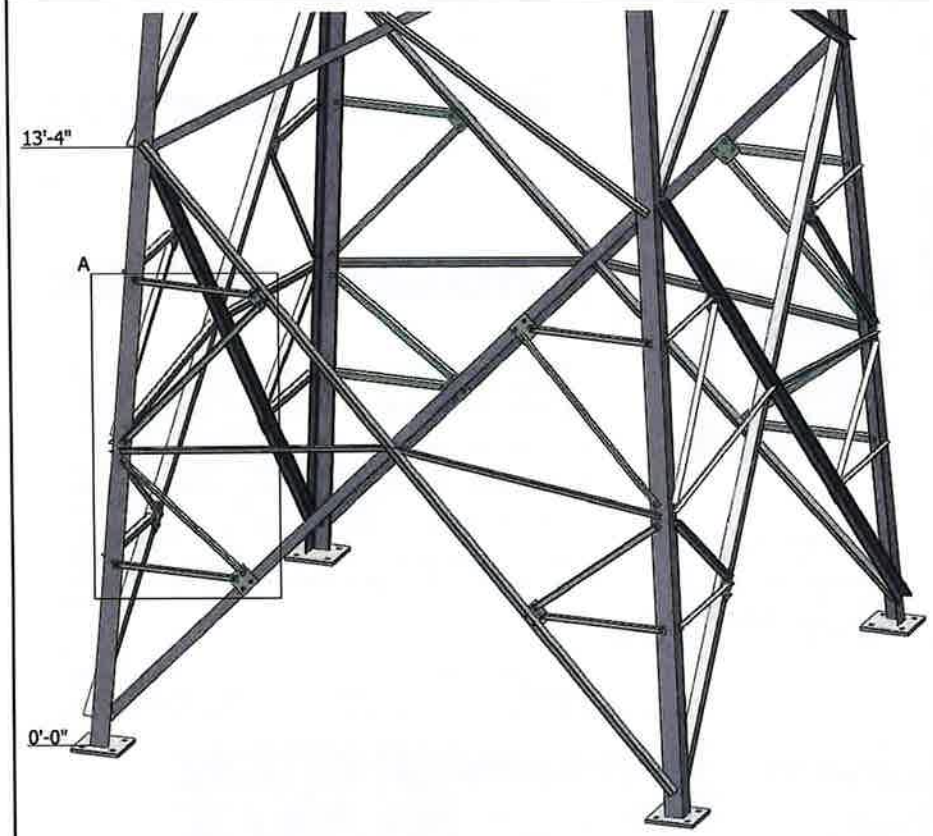
NO.	DATE	DESCRIPTION	BY	CHK	APP'D
5					
4					
3					
2					
1			RM	TR	WC
0	4/20/23	MODIFICATION DRAWINGS			

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
SPECIFICATIONS

SHEET TITLE:	REVISION:
S-1	0



CP-03102-08
1-3/4"x1-3/4"x3/16" LONG SUB-HORIZONTAL

CP-03102-09
1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL

NOTES:
1. 9/16" HOLES WILL NEED TO BE FIELD DRILLED THROUGH THE TOWER LEGS AND MAIN DIAGONALS TO ACCOMMODATE FIT UP. ENSURE THE LEG HOLES HAVE A 1-1/2" C-E TEAR OUT AND USE THE GUSSET PLATE AS A TEMPLATE TO LOCATE THE DIAGONAL HOLES.
2. SUB-HORIZONTALS AND SUB-DIAGONALS ARE SENT LONG WITH ONE END BOLT HOLE SHOP FABRICATED. ANGLES WILL NEED TO BE FIELD FABRICATED FOR FIT UP.
3. TRIM ANGLES TO LENGTH AND MATCH THE SHOWN SHOP FABRICATED END BOLT DIMENSIONS.
4. COAT ALL EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

BLUE SKY TOWERS LLC

Structural Components
1870 W 64TH LANE
DENVER, CO 80221
(888) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

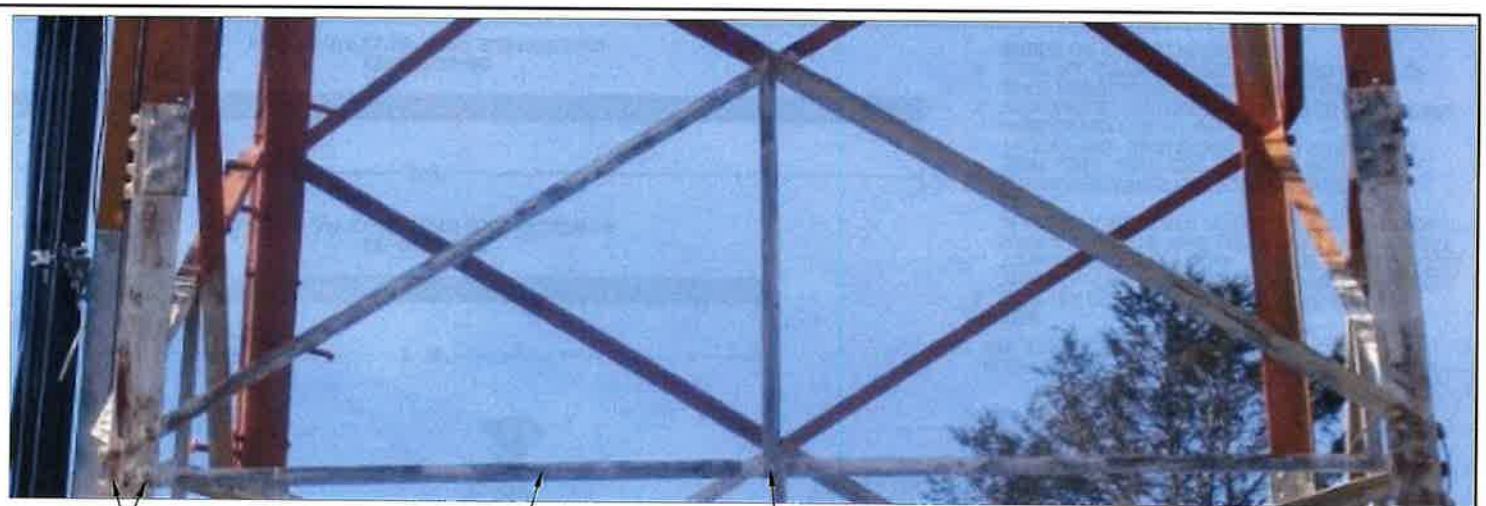
NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
SUB-DIAG. & SUB-HORZ. INSTALL DETAILS

SHEET TITLE: D-1 | REVISION: 0



TYPICAL GIRT END BOLTS:
(2) 5/8" x 1-3/4" A325 BOLTS
(2) 5/8" LOCK WASHERS
(2) 5/8" NUTS

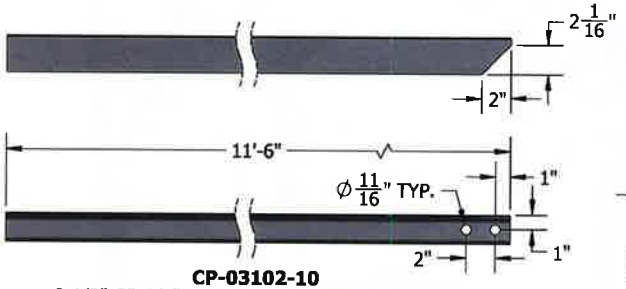
REPLACE EXISTING TOP GIRTS WITH NEW 2-1/2"x2"x1/4" ANGLE.
TYP. PER TOWER FACE

RE-ATTACH THE VERTICAL ANGLE TO THE REPLACEMENT TOP GIRT WITH:
(1) 5/8" x 1-1/2" A325 BOLT
(1) 5//8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

RE-ATTACH THE INTERNAL MEMBERS TO THE REPLACEMENT TOP GIRT WITH:
(1) 5/8" x 1-1/2" BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

NOTES:
1. REPLACEMENT TOP GIRT ANGLES ARE SENT LONG WITH ONE END SHOP FABRICATED. ANGLES WILL NEED TO BE FIELD FABRICATED FOR FIT UP.
2. TRIM ANGLES TO LENGTH AND MATCH THE SHOWN SHOP FABRICATED END BOLT DIMENSIONS.
3. THE SHOP FABRICATED COPE IS ESTIMATED, COPE ANGLES AS NEEDED TO ACCOMMODATE FIT UP.
4. COAT ALL EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.
5. DO NOT REMOVE ANY TOWER HARDWARE OR MEMBERS IF WIND SPEEDS ARE FORECAST TO BE 20 MPH OR HIGHER.
6. ALL NEW TOP GIRT REPLACEMENT HARDWARE PROVIDED.

NOTE:
MATCH THE EXISTING TOP GIRT COPE TO ACCOMMODATE FIT UP. THE SHOP FABRICATED COPE IS ESTIMATED AND MAY NEED TO BE MODIFIED.



CP-03102-10
2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT

BLUE SKY TOWERS LLC

Structural Components
Bringing It All Together

1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

STATE OF CONNECTICUT
SHAWN T. DE BOER
No. 18966
LICENSED PROFESSIONAL ENGINEER

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
5					
4					
3			RM	TR	WC
2					
1					
0	4/20/23	MODIFICATION DRAWINGS			

SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

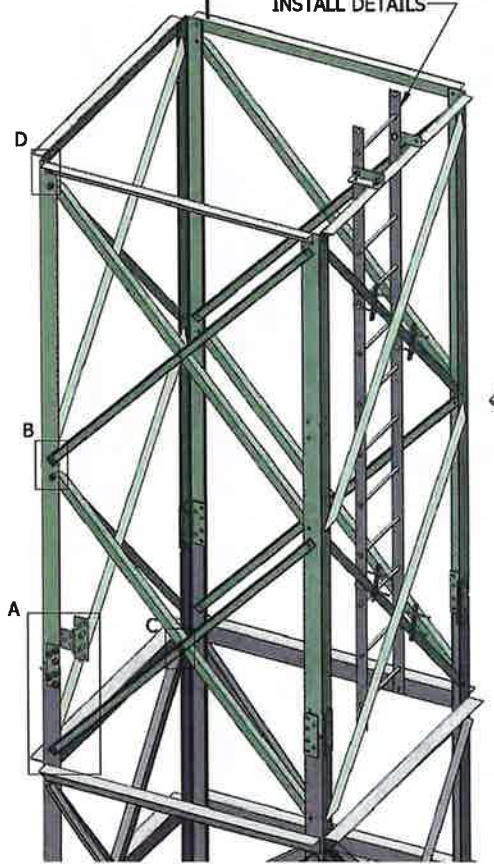
DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
TOP GIRT INSTALL DETAILS

SHEET TITLE:	REVISION:
D-2	0

INSTALL THE PROVIDED 5/8" x 6' LIGHTNING ROD TO THE EXTENSION TOP GIRT AT THE DESIRED LOCATION.
FIELD DRILL A 11/16" HOLE IN THE TOP GIRT TO ACCOMMODATE FIT UP.

NOTE: REFERENCE THE FOLLOWING SHEET FOR LADDER INSTALL DETAILS

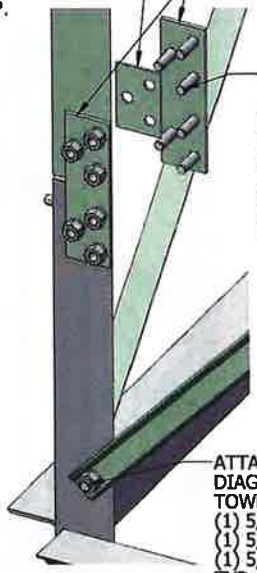


REMOVE THE (4) EXISTING TOWER TOP GIRTS PRIOR TO INSTALLING THE TOWER EXTENSION.

1/8" THICK SHIM PLATE

TYPICAL 1/4" THICK SPLICE PLATE

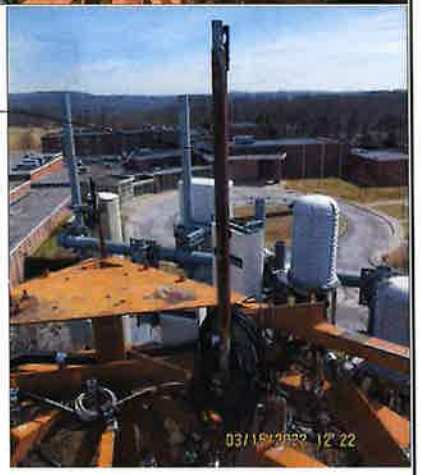
BOLT THE EXTENSION TO THE TOWER LEG WITH:
(6) 5/8" x 2" A325 BOLTS
(6) 5/8" LOCK WASHERS
(6) 5/8" NUTS
TYP. PER LOCATION
(6) BOLTS PER ANGLE FACE
(12) TOTAL BOLTS PER LEG
11/16" HOLES WILL NEED TO BE FIELD DRILLED INTO THE EXISTING TOWER LEGS TO ACCOMMODATE FIT UP. USE THE SPLICE PLATES TO LOCATE THE FIELD DRILLED HOLES.

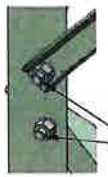


DETAIL A

ATTACH THE EXTENSION DIAGONAL TO THE EXISTING TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION
NOTE: FIELD DRILL 11/16" HOLE TO ACCOMMODATE FIT UP. ENSURE THERE IS A MINIMUM 1-1/4" C-E TEAR OUT ON THE LEG.

THE 1-5/16" OD SAFETY CLIMB RAIL MAY BE REMOVED PRIOR TO INSTALLING THE TOWER EXTENSION.





DETAIL B

BOLT THE SINGLE DIAGONAL TO THE TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL C

STITCH BOLT THE DIAGONALS TOGETHER WITH:
(1) 5/8" x 2" A325 BOLT
(1) 1/4" THICK RINGFILL
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL D

BOLT THE TOP GIRT TO THE LEG WITH
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

BOLT THE SINGLE DIAGONAL TO THE TOWER LEG WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

NOTES:
1. NOT ALL HARDWARE IS SHOWN IN MODEL.
2. TOWER EXTENSION WILL BE SENT FULLY SHOP FABRICATED.
3. COAT ALL FIELD DRILLED HOLES WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

BLUE SKY TOWERS LLC

Structural Components
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC

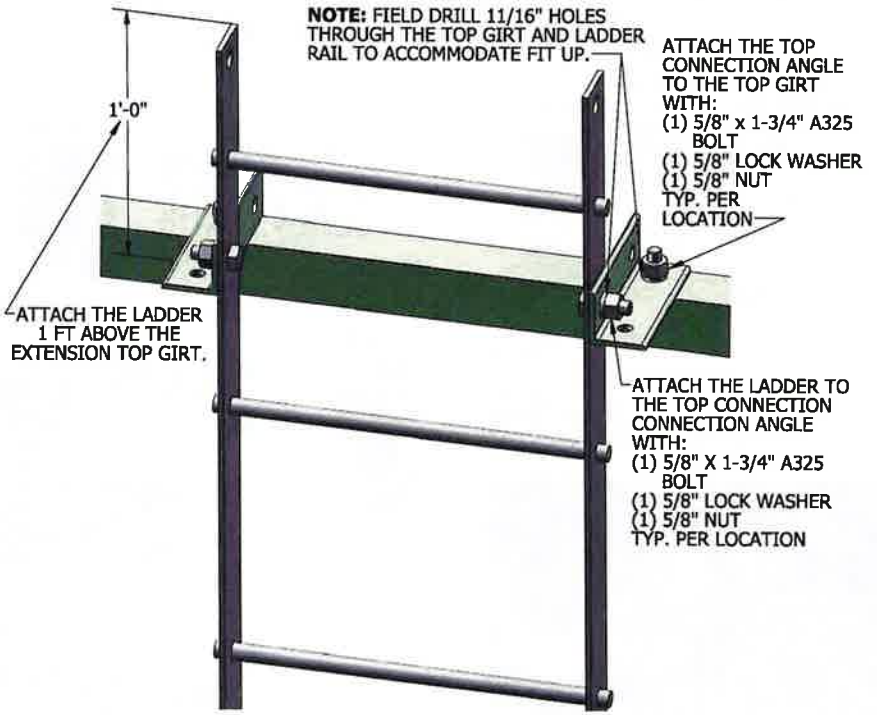
SITE INFORMATION:
97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:
SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:
TOWER EXTENSION DETAILS

SHEET NUMBER: D-3

REVISION: 0

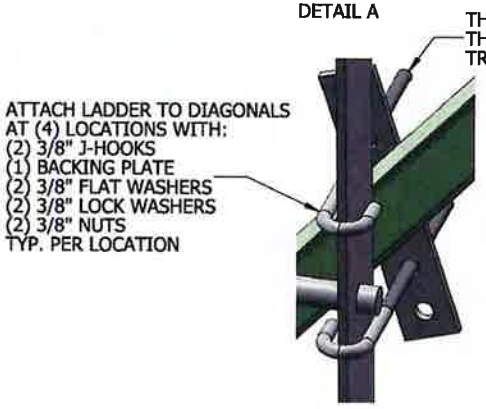


NOTE: FIELD DRILL 11/16" HOLES THROUGH THE TOP GIRT AND LADDER RAIL TO ACCOMMODATE FIT UP.

ATTACH THE TOP CONNECTION ANGLE TO THE TOP GIRT WITH:
(1) 5/8" x 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

ATTACH THE LADDER TO THE TOP CONNECTION CONNECTION ANGLE WITH:
(1) 5/8" X 1-3/4" A325 BOLT
(1) 5/8" LOCK WASHER
(1) 5/8" NUT
TYP. PER LOCATION

DETAIL A



DETAIL B

NOTE: COAT EXPOSED STEEL WITH TWO COATS OF BRUSH ON GALVALITE ZRC PAINT.

BLUE SKY TOWERS LLC

Structural Components
1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC
1					
2					
3					
4					
5					

SITE INFORMATION
97 HIGH STREET
PORTLAND CT 06480

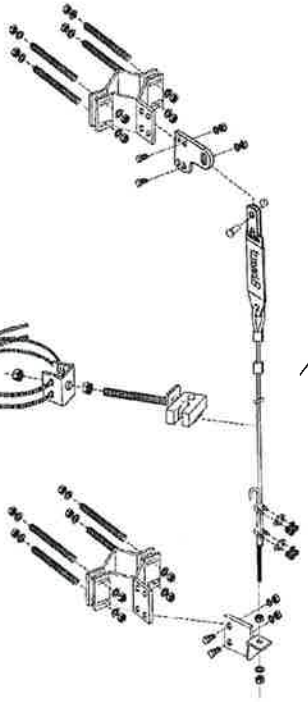
DESIGN TYPE:
SELF SUPPORT
TOWER
MODIFICATION

SHEET TITLE:
SAFETY CLIMB
INSTALL DETAILS

SHEET TITLE: D-4 | REVISION: 0

SAFETY CLIMB INSTALL (7' TO 57')

INSTALL THE TOP SAFETY CLIMB LEG BRACKET TO LEG C AT APPROXIMATELY 57 FT.

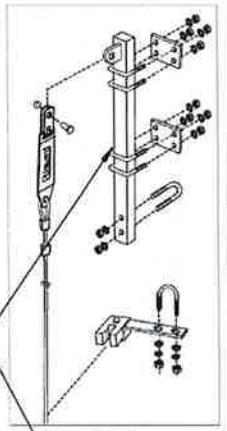


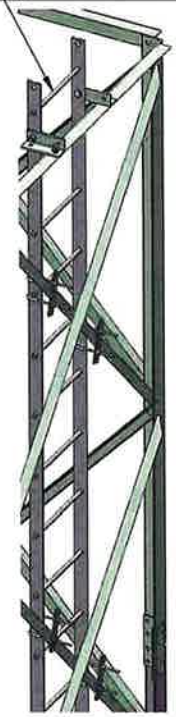
REMOVE THE LOWER 1-5/16" OD SAFETY CLIMB RAIL ON LEG C PRIOR TO INSTALLING THE NEW SAFETY CLIMB.

INSTALL THE BOTTOM SAFETY CLIMB LEG BRACKET TO LEG C AT APPROXIMATELY 7 FT.

SAFETY CLIMB INSTALL (54' TO 91')

INSTALL THE TOP LADDER MOUNT SAFETY CLIMB BRACKET TO THE CLIMBING LADDER. ENSURE THE BRACKET IS ATTACHED TO THE TOP (3) LADDER RUNGS.





REMOVE THE UPPER 1-5/16" OD SAFETY CLIMB RAIL ON FACE BC PRIOR TO INSTALLING THE NEW SAFETY CLIMB.

INSTALL THE BOTTOM SAFETY CLIMB LEG BRACKET TO THE INTERNAL CLIMBING ANGLE ON FACE BC APPROXIMATELY 4' ABOVE THE PLATFORM.

NOTE: FOLLOW ALL SAFETY CLIMB MANUFACTURES INSTALLATION INSTRUCTIONS.

NOTE: SAFETY CLIMB TRANSITION PLATFORM SITS AT APPROXIMATELY 50'-3".

BLUE SKY TOWERS LLC

Structural Components

1870 W 64TH LANE
DENVER, CO 80221
(866) 386 - 7622
JOB #: 230218

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
0	4/20/23	MODIFICATION DRAWINGS	RM	TR	WC
1					
2					
3					
4					
5					

SITE INFORMATION:

97 HIGH STREET
PORTLAND CT 06480

DESIGN TYPE:

SELF SUPPORT TOWER MODIFICATION

SHEET TITLE:

SAFETY CLIMB INSTALL DETAILS (CON'T'D)

SHEET TITLE:	REVISION:
D-5	0

Structural Components
Bringing It All Together.

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	SRR Towers, Inc	DATE AT SITE:	Monday, September 11, 2023
SITE (ID):	CT-1680	TOWER TYPE:	SST
ADDRESS:	97 High Street	TOWER HEIGHT:	90'
	Portland, CT 06480	WEATHER:	75F, sunny, N wind 0-5mph
LEAD:	Wilson Worn	SUPPORT:	Ani Doke

APPENDIX B

PHOTOS DURING & AFTER CONSTRUCTION

CT-1680 Site Photos (1)


CT-1680 Site Photos (2)


CT-1680 Site Photos (3)


CT-1680 Site Photos (4)


CT-1680 Site Photos (5)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Structural Components
Bringing It All Together.

1870 W. 64th Lane, Unit A Denver, CO 80221 PH: 720-489-3764

CLIENT:	SRR Towers, Inc	DATE AT SITE:	Monday, September 11, 2023
SITE (ID):	CT-1680	TOWER TYPE:	SST
ADDRESS:	97 High Street	TOWER HEIGHT:	90'
	Portland, CT 06480	WEATHER:	75F, sunny, N wind 0-5mph
LEAD:	Wilson Worn	SUPPORT:	Ani Doke

APPENDIX C

MATERIAL TESTING REPORTS

Portland CT
1680

Submittal Drawings

Structural Components
Bringing It All Together.

BOM

Job: Blue Sky - Portland_CT-1680
Description: Mat and HW, BOM ID: 8952
Date: 4/5/2023

1670 W 64th Lane, Unit A Denver, CO 80221 PH: 720-304-8839

Part #/Description	Qty.	Unit Wt.	Combined Wt.
CP-03102-01 - PORTLAND CT - EXTENSION - INNER & OUTER LEG SPLICE PLATE	17	1.97 lb.	33.49 lb.
CP-03102-02 - PORTLAND CT - EXTENSION - LEG SPLICE SHIM PLATE	10	0.44 lb.	4.40 lb.
CP-03102-03 - PORTLAND CT - EXTENSION - LEG	4	65.85 lb.	263.40 lb.
CP-03102-04 - PORTLAND CT - EXTENSION - DIAGONAL	16	23.60 lb.	377.60 lb.
CP-03102-05 - PORTLAND CT - EXTENSION - TOP GIRT	4	15.84 lb.	62.56 lb.
CP-03102-06 - PORTLAND CT - LADDER TOP CONNECTION ANGLE	2	2.33 lb.	4.66 lb.
CP-03102-07 - PORTLAND CT - 3/8" THICK GUSSET PLATE	17	3.73 lb.	63.41 lb.
CP-03102-08 - PORTLAND CT - 1-3/4"x1-3/4"x3/16" LONG SUB-HORIZONTAL	16	8.01 lb.	128.16 lb.
CP-03102-09 - PORTLAND CT - 1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL	16	11.85 lb.	189.60 lb.
CP-03102-10 - PORTLAND CT - 2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT	4	41.20 lb.	164.80 lb.
CW-01133-01 - PORTLAND CT - 12' LADDER WELDMENT	1	76.52 lb.	76.52 lb.
H01-1017-12 - 5/8" x 1-3/4" x 1-1/4" A325 STRUCTURAL BOLT	77	0.26 lb.	20.02 lb.
H01-1020-12 - 5/8" x 2" x 1-1/4" A325 STRUCTURAL BOLT	60	0.29 lb.	17.40 lb.
H02-0006-16 - 3/8"-16 Heavy Hex Nut - HDG	10	0.04 lb.	0.40 lb.
H02-0010-11 - 5/8"-11 A563DH Galvanized Nut	137	0.13 lb.	17.81 lb.
H03-0006-02 - 3/8" F436 Galvanized Flat Washer	10	0.01 lb.	0.10 lb.
H04-0006-01 - 3/8" Spring Lock Washer HDG	10	0.01 lb.	0.10 lb.
H04-0010-01 - 5/8" Galvanized Heavy Lock Washer	137	0.03 lb.	4.11 lb.
H26-1065-60 - 3/8" X 3/4" X 8-1/2" X 6" J-BOLT	9	0.32 lb.	2.88 lb.
H41-0010-06 - 5/8" x 6' Lightning Rod Kit (Primus # 5/8SCCAT)	1	5.50 lb.	5.50 lb.
H42-110-001 - BOTTOM TENSIONER PLATE (AF PN 14AFPMJHB01)	1	10.00 lb.	10.00 lb.

Structural Components
Bringing It All Together.

BOM

Job: Blue Sky - Portland_CT-1680
Description: Mat and HW, BOM ID: 8952
Date: 4/5/2023

1870 W 64th Lane, Unit A Denver, CO 80221 PH: 720-304-8839

Part #/Description	Qty.	Unit Wt.	Combined Wt.
H42-120-050 - AF - 50' SAFETY CLIMB - LADDER MOUNT - SS - SHORT TOP - 14LMSC50SS	1	90.00 lb.	90.00 lb.
H42-130-031 - ROUND LEG CLAMP BRACKET - 2"-4" Diameters (AF PN 14AFVB1)	1	12.00 lb.	12.00 lb.
H42-130-050 - AF - 50' SAFETY CLIMB - ROUND & ANGLE LEG - SS - 14RCL50SS	1	115.00 lb.	115.00 lb.
H82-0010-02 - RINGFILL - 5/8" BOLT - 1/4" THICK	10	0.19 lb.	1.90 lb.
HK1-0815-10 - 1/2" x 1-1/2" x 1" A325 BOLT HW KIT	35	0.24 lb.	8.40 lb.
HK1-0817-10 - 1/2" x 1-3/4" x 1" A325 BOLT HW KIT	70	0.26 lb.	18.20 lb.
P597-018-06 - P10 - CABLE LADDER - BACKING PLATE	5	0.74 lb.	3.70 lb.
Total			**1696.12 lb.**

Structural Components
Bringing It All Together.

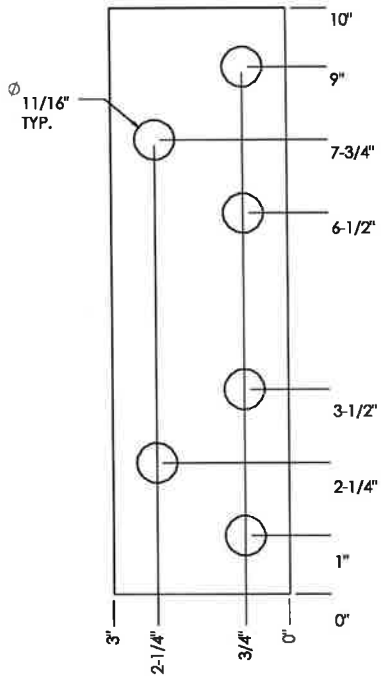
BOM

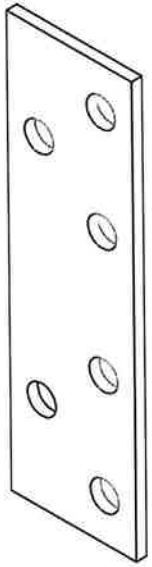
Description: Mat and HW, BOM ID: 8952 Date: 4/5/2023

1870 W 64th Lane, Unit A Denver, CO 80221 PH: 720-304-8839

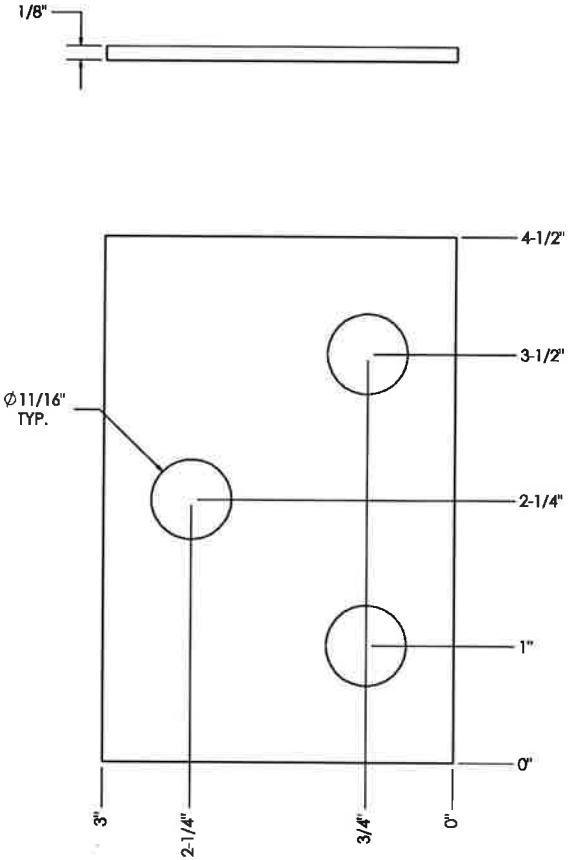
Sub-Component Quantities

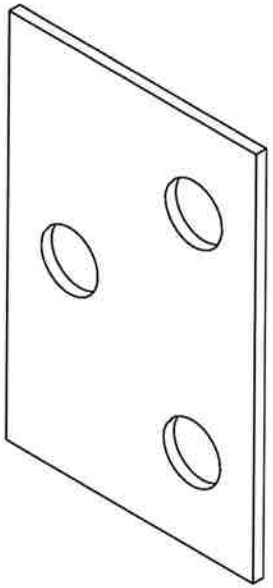
	Description	Qty.	Unit Wt.	Combined Wt.
S-1	CP-03102-11 PORTLAND CT - 12' LADDER - RAIL	2	25.07 lb.	50.14 lb.
S-2	CP-03102-12 PORTLAND CT - 12' LADDER - RUNG	12	2.20 lb.	26.40 lb.
S-3	H01-0815-10 1/2" x 1-1/2" x 1" A325 STRUCTURAL BOLT	35	0.14 lb.	4.90 lb.
S-4	H01-0817-10 1/2" x 1-3/4" 1" A325 STRUCTURAL BOLT	70	0.16 lb.	11.20 lb.
S-5	H02-0008-13 1/2"-13 A563DH Galvanized Nut	105	0.08 lb.	8.40 lb.
S-6	H03-0008-02 1/2" F436-1 Galvanized Flat Washer	105	0.02 lb.	2.10 lb.
S-7	H04-0008-01 1/2" Galvanized Heavy Lock Washer	105	0.02 lb.	2.10 lb.



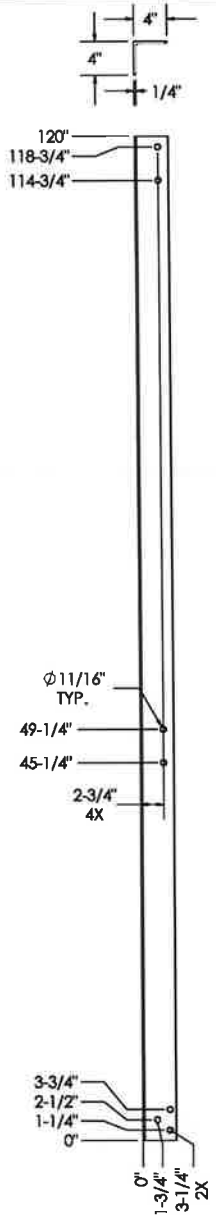


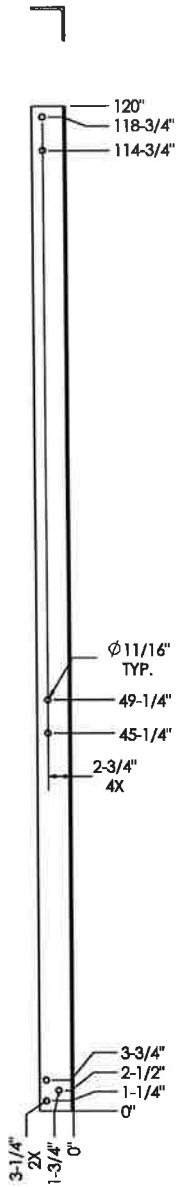
SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: GALVANIZED	3			
4/4/2023	SCALE: 1:2	WEIGHT (lbs): 1.974	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °, BEND ½ ° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - EXTENSION - INNER & OUTER LEG SPLICE PLATE
		DRAWN: RM	0	INITIAL RELEASE	4/5/23	PART NUMBER: CP-03102-01 REV: 0
		PROJECT: 220142	REV	DESCRIPTION	DATE	





SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: GALVANIZED	3			PORTLAND CT - EXTENSION - LEG SPLICE SHIM PLATE
4/4/2023	SCALE: 1:1	WEIGHT (lbs): 0.440	2			PART NUMBER: CP-03102-02
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ±2° ALL OTHERS: ±1/16"		DESIGNER: WC	1			REV: 0
		DRAFTER: RM	0	INITIAL RELEASE	4/5/23	
		PROJECT: 220142	REV	DESCRIPTION	DATE	





SHEET 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL A36	4			Structural Components
4/5/2023	SCALE 1:14	FINISH GALVANIZED	3			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ±2° ALL OTHERS: ±1/16"		WEIGHT (lbs) 65.851	2			PORTLAND CT - EXTENSION - LEG
		DESIGNER WC	1			PART NUMBER CP-03102-03 REV 0
		DRAFTER RM	0	INITIAL RELEASE	4/5/23	
		PROJECT 220142	REV	DESCRIPTION	DATE	

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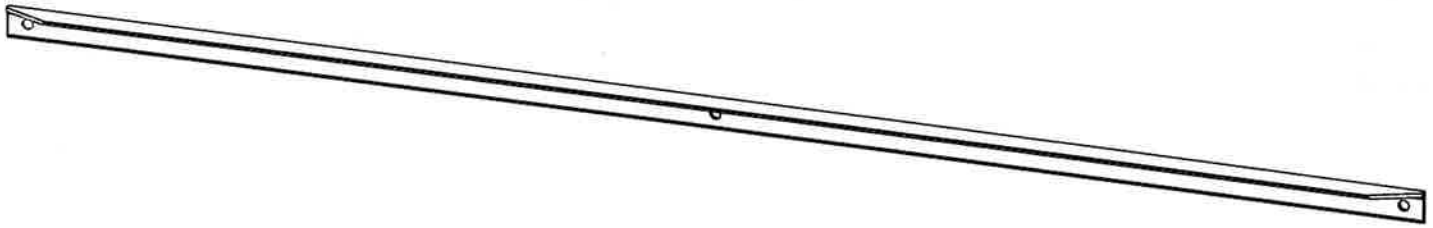
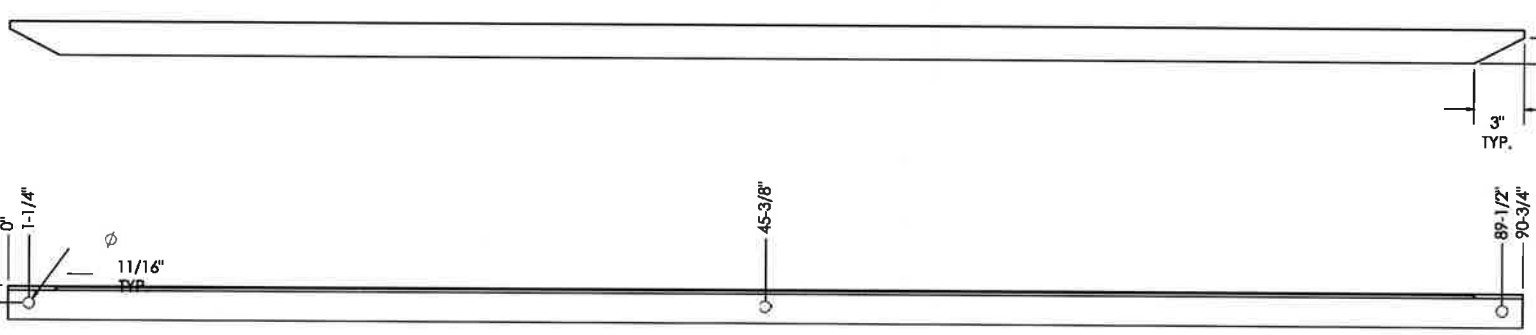
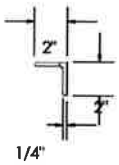
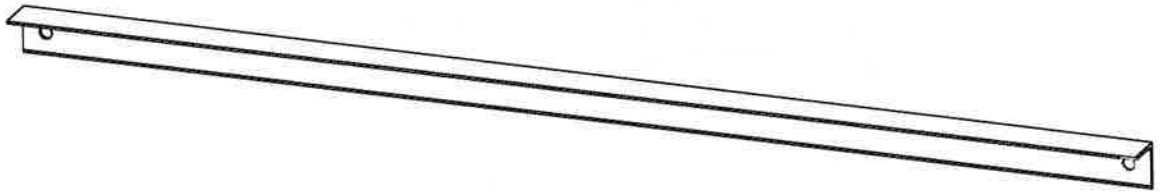
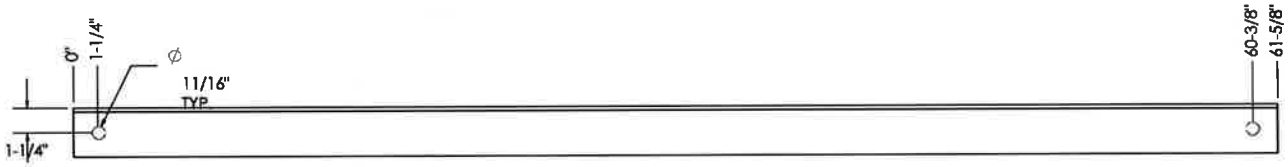


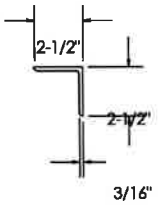




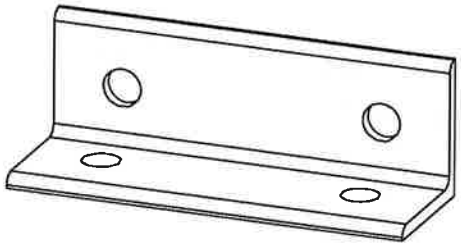
SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
4/4/2023	SCALE: 1:7	FINISH: GALVANIZED	3			PORTLAND CT - EXTENSION - DIAGONAL
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °; BEND ½ ° ALL OTHERS: ±1/16"		WEIGHT (lbs): 23.596	2			PART NUMBER: CP-03102-04
		DESIGNER: WC	1			REV: 0
		DRAFTER: RM	0	NITIAL RELEASE	4/5/23	
		PROJECT: 220142	REV	DESCRIPTION	DATE	

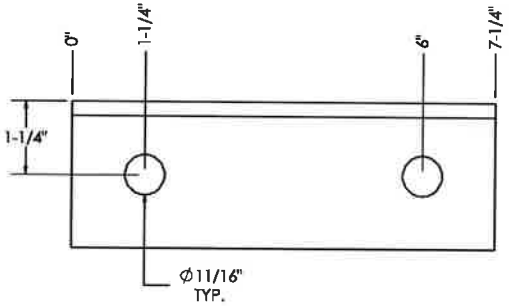


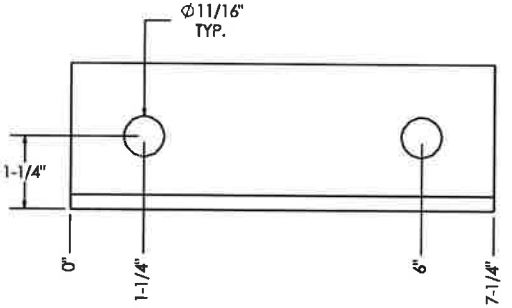


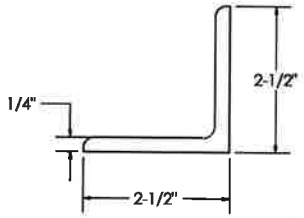


SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: GALVANIZED	3			
4/4/2023	SCALE: 1:6	WEIGHT (lbs): 15.639	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °, BEND ±2 ° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - EXTENSION - TOP GIRT
		DRAWER: RM	0	INITIAL RELEASE	4/5/23	PART NUMBER: CP-03102-05 REV: 0
		PROJECT: 220142	REV	DESCRIPTION	DATE	









SHEET 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL A36	4			Structural Components
		FINISH GALVANIZED	3			
4/4/2023	SCALE 1:2	WEIGHT (lbs) 2.327	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE±1/4°, BEND ±2° ALL OTHERS: ±1/16"		DESIGNER WC	1			PORTLAND CT - LADDER TOP CONNECTION ANGLE
		DRAFTER RM	0	INITIAL RELEASE	4/5/23	PART NUMBER CP-03102-06 REV 0
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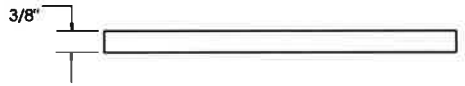

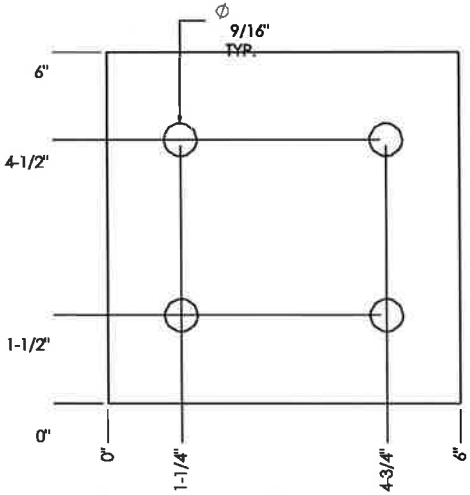

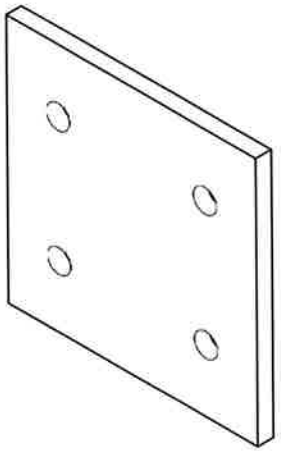

SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: GALVANIZED	3			
4/4/2023	SCALE: 1:2	WEIGHT (lbs): 3.732	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °, BEND ≤2 ° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - 3/8" THICK GUSSET PLATE
		DRAWN: RM	0	INITIAL RELEASE	4/5/23	PART NUMBER: CP-03102-07 REV: 0
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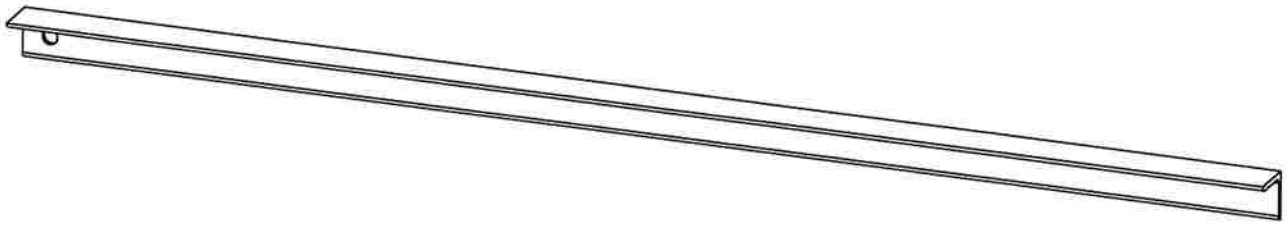
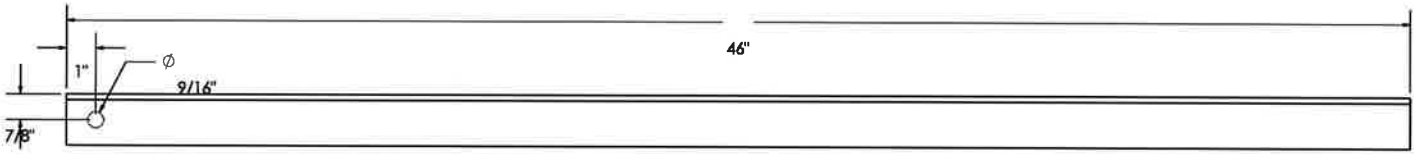
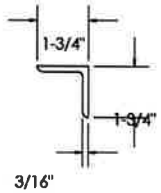
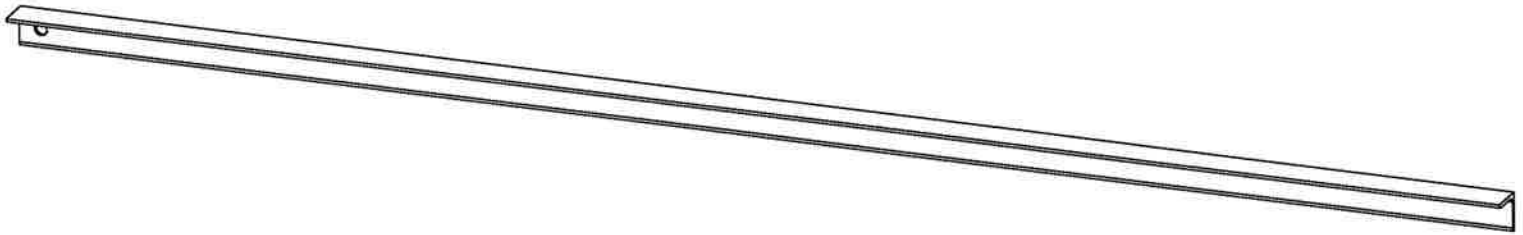
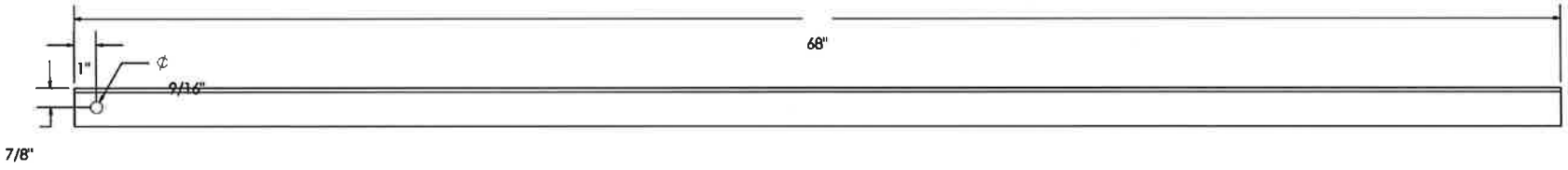






SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components	
4/4/2023	SCALE: 1:4	FINISH: GALVANIZED	3			PORTLAND CT - 1-3/4"x1-3/4"x2/16" LONG SUB-HORIZONTAL	
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °; BEND ±2 ° ALL OTHERS: ±1/16"		WEIGHT [lbs]: 8.012	2			PART NUMBER: CP-03102-08	REV: 0
		DESIGNER: WC	1				
		DRAWN: RM	0	INITIAL RELEASE	4/5/23		
		PROJECT: 220142	REV	DESCRIPTION	DATE		



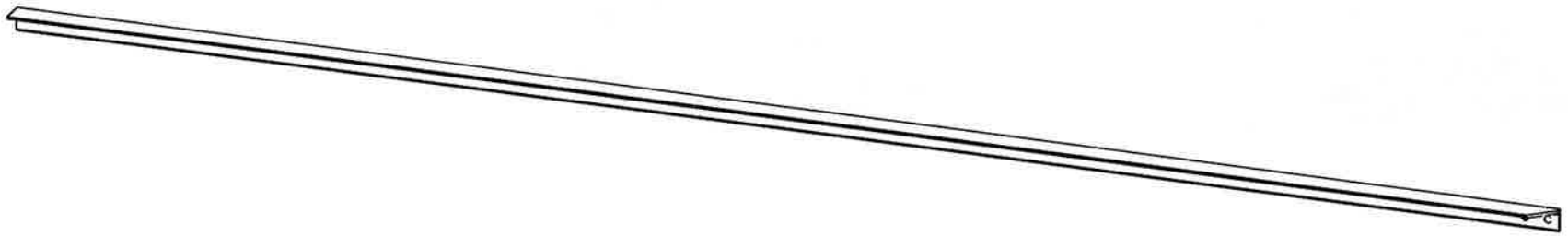


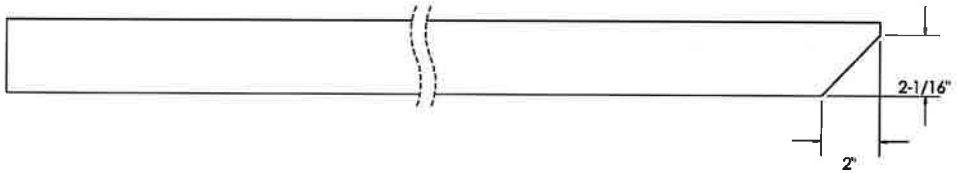
SHEET 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL A36	4		
		FINISH GALVANIZED	3		
4/4/2023	SCALE 1:5	WEIGHT (lbs) 11.850	2		
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ℄ ° ALL OTHERS: ±1/16"		DESIGNER WC	1		
		DRAFTER RM	0	INITIAL RELEASE	4/5/23
		PROJECT 220142	REV	DESCRIPTION	DATE

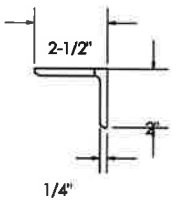
Structural Components

PORTLAND CT - 1-3/4"x1-3/4"x3/16" LONG SUB-DIAGONAL

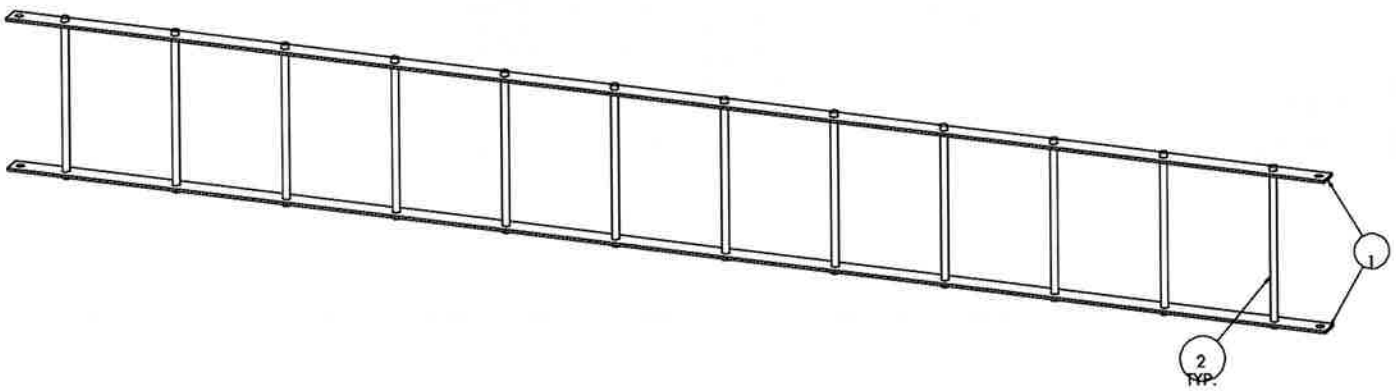
PART NUMBER CP-03102-09 REV 0

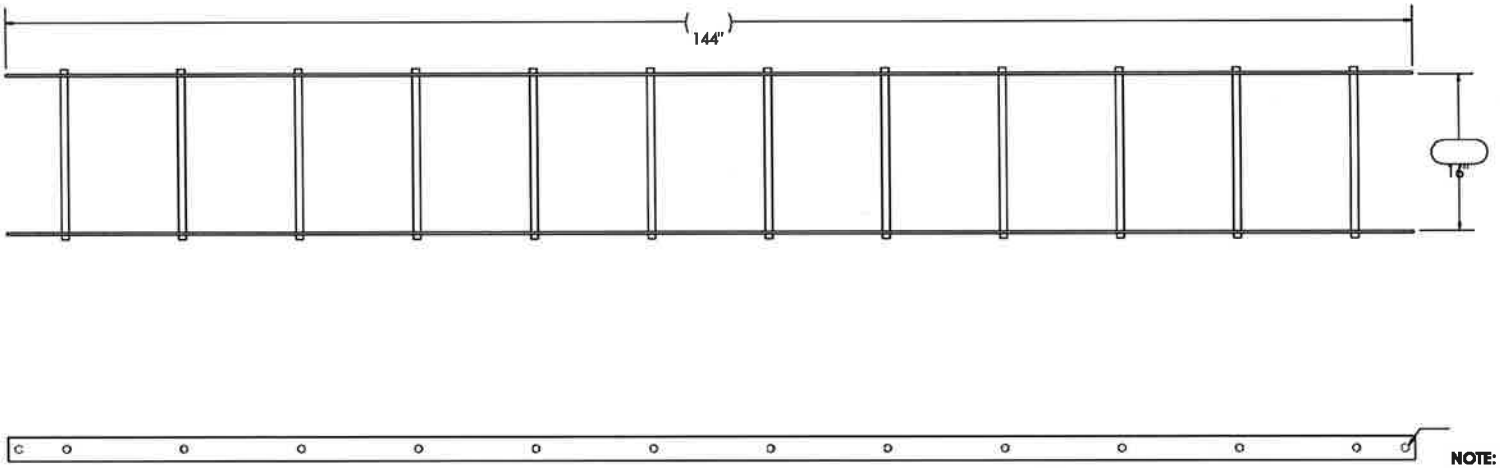


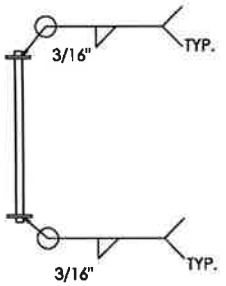




SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: GALVANIZED	3			
4/4/2023	SCALE: 1:4	MASS (lbs): 41.199	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°; BEND ±2° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - 2-1/2"x2"x1/4" LONG REPLACEMENT TOP GIRT
		DRAWN: RM	0	INITIAL RELEASE	4/5/23	PART NUMBER: CP-03102-10 REV: 0
		PROJECT: 220142	REV	DESCRIPTION	DATE	







NOTE: BOTTOM AND TOP HOLE SETS DO NOT GET LADDER RUNGS.

ITEM NO.	PART #	DESCRIPTION	REV.	QTY.
1	CP-03102-11	PORTLAND CT - 12' LADDER - RAIL	0	2
2	CP-03102-12	PORTLAND CT - 12' LADDER - RUNG	0	12

SHEET: 1 OF 1 | THIRD ANGLE PROJECTION
4/4/2023 | SCALE: 1:12

DIMENSIONS ARE IN INCHES
TOLERANCES U.N.O.
HOLES: +1/16", -1/32"
ANGULAR: PROFILE ±1/4°, BEND ½°
ALL OTHERS: ±1/16"

MATERIAL: —
FINISH: GALVANIZED
WEIGHT (lbs): 76.52
DESIGNER: WC
DRAFTER: RM
PROJECT: 220142

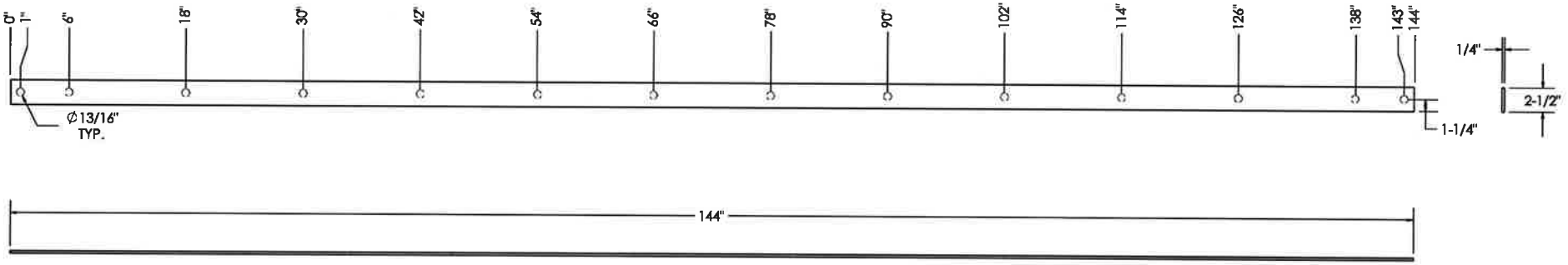
REV	DESCRIPTION	DATE
4		
3		
2		
1		
0	INITIAL RELEASE	4/24/23

Structural Components

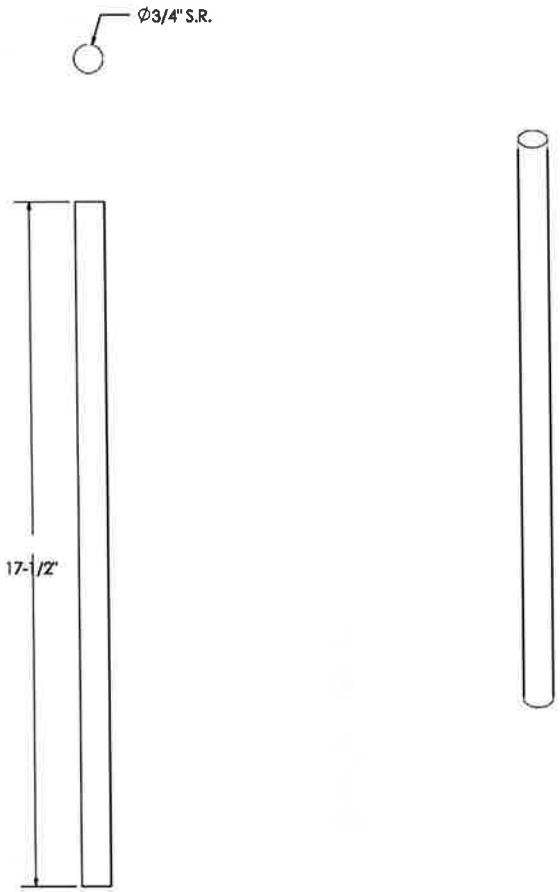
PORTLAND CT - 12' LADDER WELDMENT

PART NUMBER: CW-01133-01 | REV: 0

Z:\Jobs\Blue Sky Tower III LLC\Portland - CT 168N\220142 - RFQ GPE PO TM SA MD INV\Drawings\Fab. Drawings\



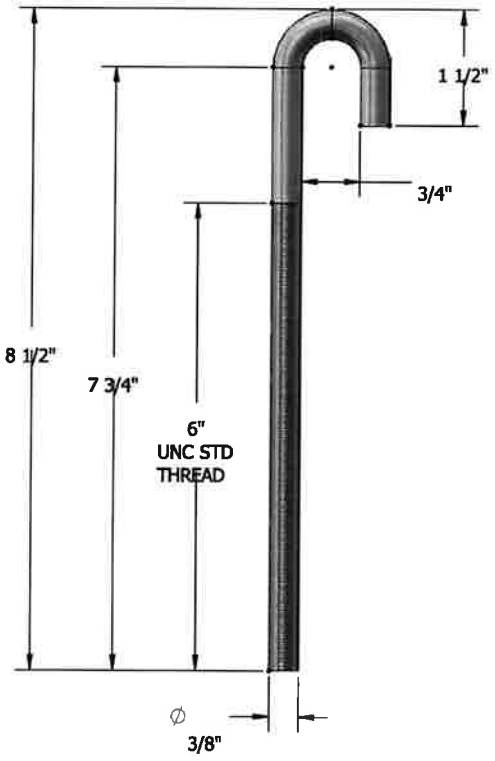
SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: NONE	3			
4/4/2023	SCALE: 1:10	WEIGHT (lbs): 25.07	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4", BEND ±2 ° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - 12' LADDER - RAIL
		DRAFTER: RM	0	INITIAL RELEASE	4/6/23	PART NUMBER: CP-03102-11 REV: 0
		PROJECT: 220142	REV	DESCRIPTION	DATE	



SHEET: 1 OF 1	THIRD ANGLE PROJECTION	MATERIAL: A36	4			Structural Components
		FINISH: NONE	3			
4/4/2023	SCALE: 1:3	WEIGHT: [lbs] 2.20	2			
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4 °, BEND ½ ° ALL OTHERS: ±1/16"		DESIGNER: WC	1			PORTLAND CT - 12' LADDER - RUNG
		DRAWN: RM	0	INITIAL RELEASE	4/5/23	PART NUMBER: CP-03102-12 REV: 0
		PROJECT: 220142	REV	DESCRIPTION	DATE	

1/5/2016 2:15:48 PM

MATERIAL : A36
FINISH : GALVANIZED
WEIGHT (LBS): 0.32



PART #: H26-1085-60	3/8" X 3/4" X 8-1/2" X 6" ROUND J-BOLT			
Structural Components Bringing It All Together.	FILE: H26-1085-60 REV 0.SLDDRW			SCALE : 2:3
	PAGE NUMBER	REVISION	DRAWN BY	DATE: 1/5/2016
	1 OF 1	0	DJN	TOLERANCE: UNLESS OTHERWISE NOTED ±1/32"

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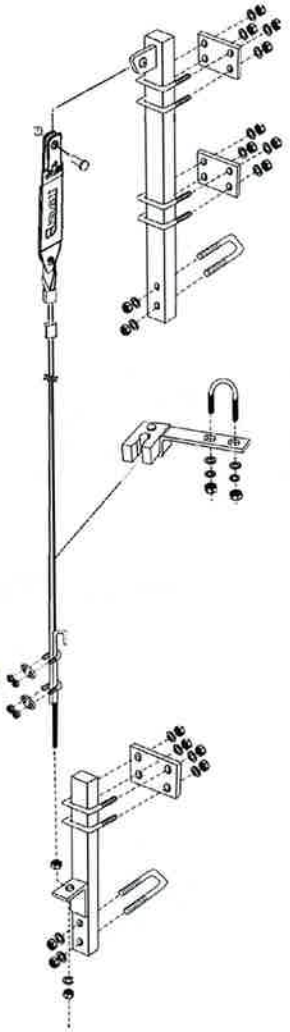
SAFETY CLIMB - LADDER MOUNT - SS

Hot Dip Galvanized Brackets | Stainless Steel Wire Rope
Conforms to ANSI A14.3-2008

PART #	LENGTH		$ Per 1 PC 1+
14LMSC100SS	100	1	$408.38
14LMSC150SS	150	1	$555.20
14LMSC200SS	200	1	$848.25
14LMSC250SS	250	1	$795.07
14LMSC300SS	300	1	$868.91
14LMSC350SS	350	1	$1,016.14
14LMSC400SS	400	1	$1,132.36
14LMSC500SS	500	1	$1,389.12

Hot Dip Galvanized Brackets | 60" Top Bracket
Stainless Steel Wire Rope | Conforms to ANSI A14.3-2008

PART #	LENGTH		$ Per 1 PC 1+
14LMSC100SS-60	100	1	$441.38
14LMSC150SS-60	150	1	$598.20
14LMSC200SS-60	200	1	$881.25
14LMSC250SS-60	250	1	$828.07
14LMSC300SS-60	300	1	$932.91
14LMSC350SS-60	350	1	$1,049.14
14LMSC400SS-60	400	1	$1,165.36
14LMSC500SS-60	500	1	$1,402.12

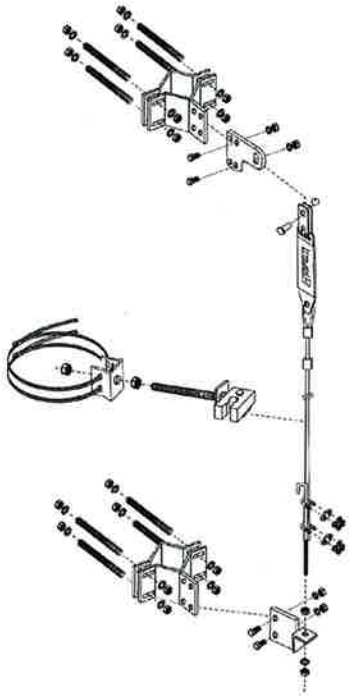


DRAWINGS AND INFORMATION SUBJECT TO CHANGE

SAFETY CLIMB - ROUND & ANGLE LEG - SS

Hot Dip Galvanized Brackets | Stainless Steel Wire Rope
Conforms to ANSI A14.3-2008

PART #	LENGTH		$ Per 1 PC 1+
14RCL100SS	100	1	$597.47
14RCL150SS	150	1	$865.73
14RCL200SS	200	1	$906.64
14RCL250SS	250	1	$1,087.81
14RCL300SS	300	1	$1,227.60
14RCL350SS	350	1	$1,374.82
14RCL400SS	400	1	$1,570.99

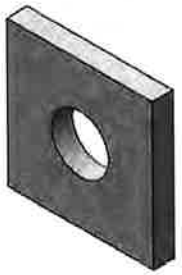


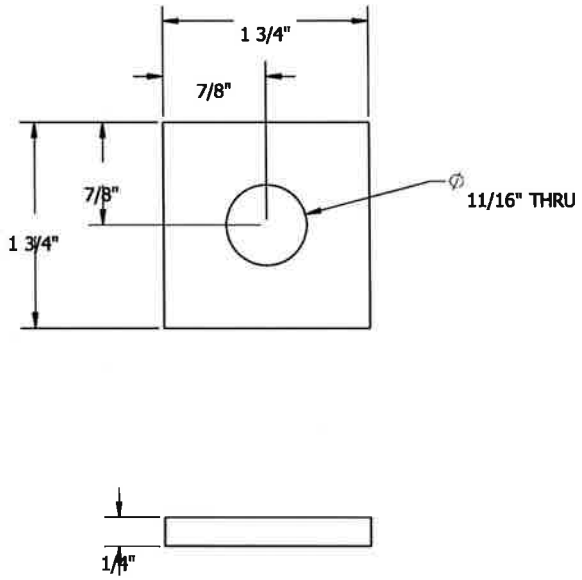
* DRAWINGS AND INFORMATION SUBJECT TO CHANGE

4/22/2015 3:02:07 PM

Z:\Product Development\Part Drawings\Hardware\H82 - Ringfills\

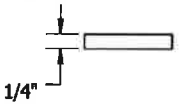
MATERIAL : A36
FINISH : GALVANIZED
WEIGHT (LBS): 0.19

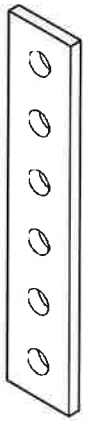


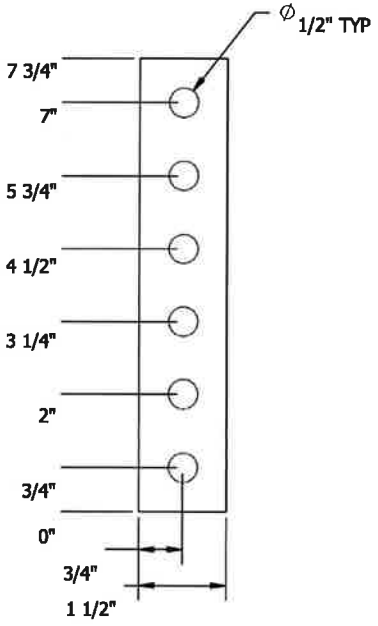


PART #: H82-0010-02	RINGFILL - 5/8" BOLT - 1/4" THICK			
Structural Components Bringing It All Together.	FILE: H82-0010-02 REV 0.SLDDRW			SCALE : 1:1
	PAGE NUMBER	REVISION	DRAWN BY	DATE: 4/22/2015
	1 OF 1	0	BEW	TOLERANCE: UNLESS OTHERWISE NOTED ±1/32"

MATERIAL : A36	
FINISH : GALVANIZED	
WEIGHT (LBS): 0.74	







PART #: P597-018-06	P10 - CABLE LADDER - BACKING PLATE			
PERFECT VISION MANUFACTURING	File: P597-018-06 REV 0.SLDDRW			SCALE : 1:2
	PAGE NUMBER	REVISION	DRAWN BY	DATE: 9/21/2015
	1 OF 1	0	DJN	TOLERANCE U.N.O.: HOLES: +1/16", - 1/32" ALL OTHER: ±1/16"

9/21/2015 1:35:43 PM

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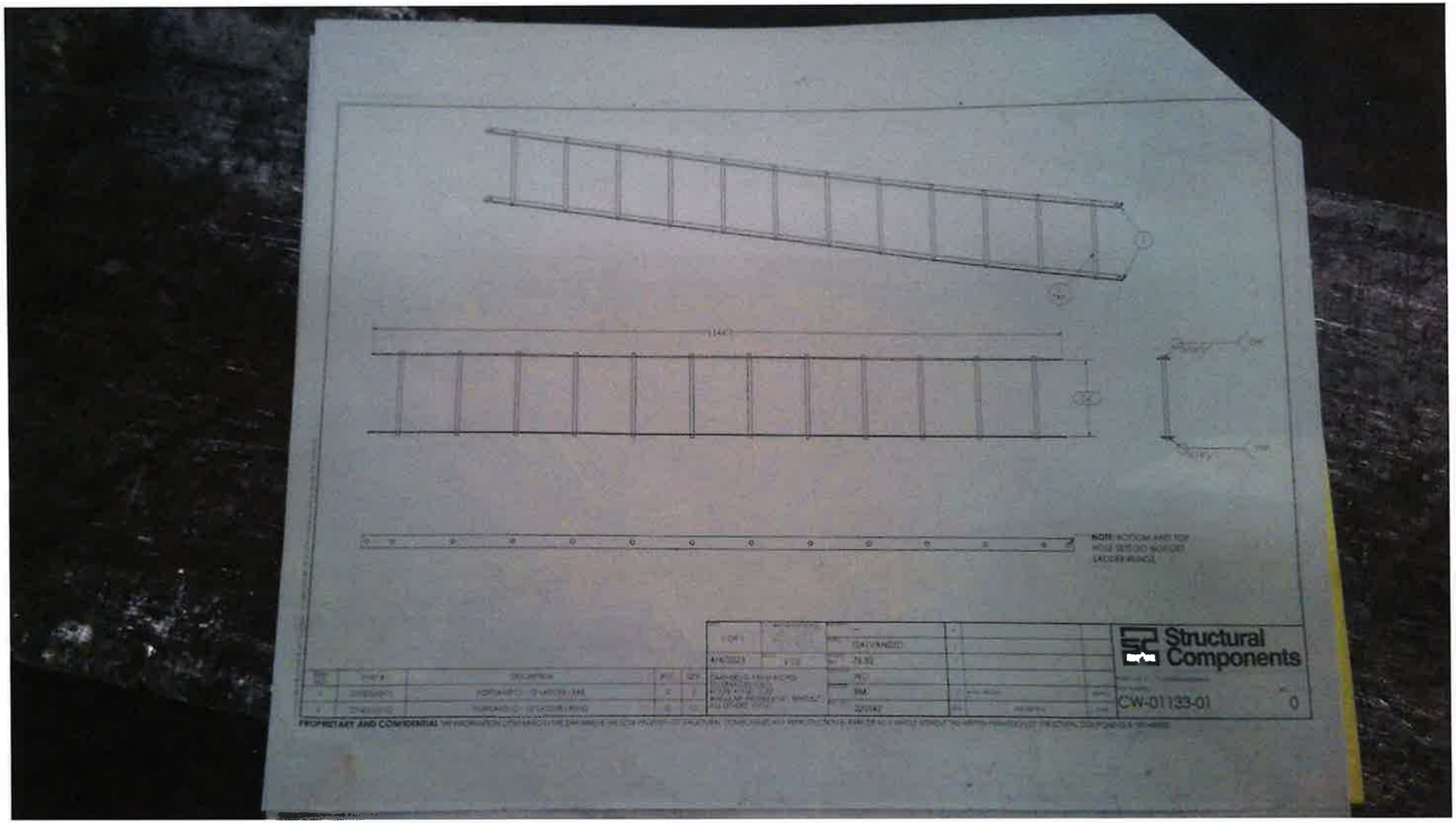
CW-01133-01



CW-01133-01

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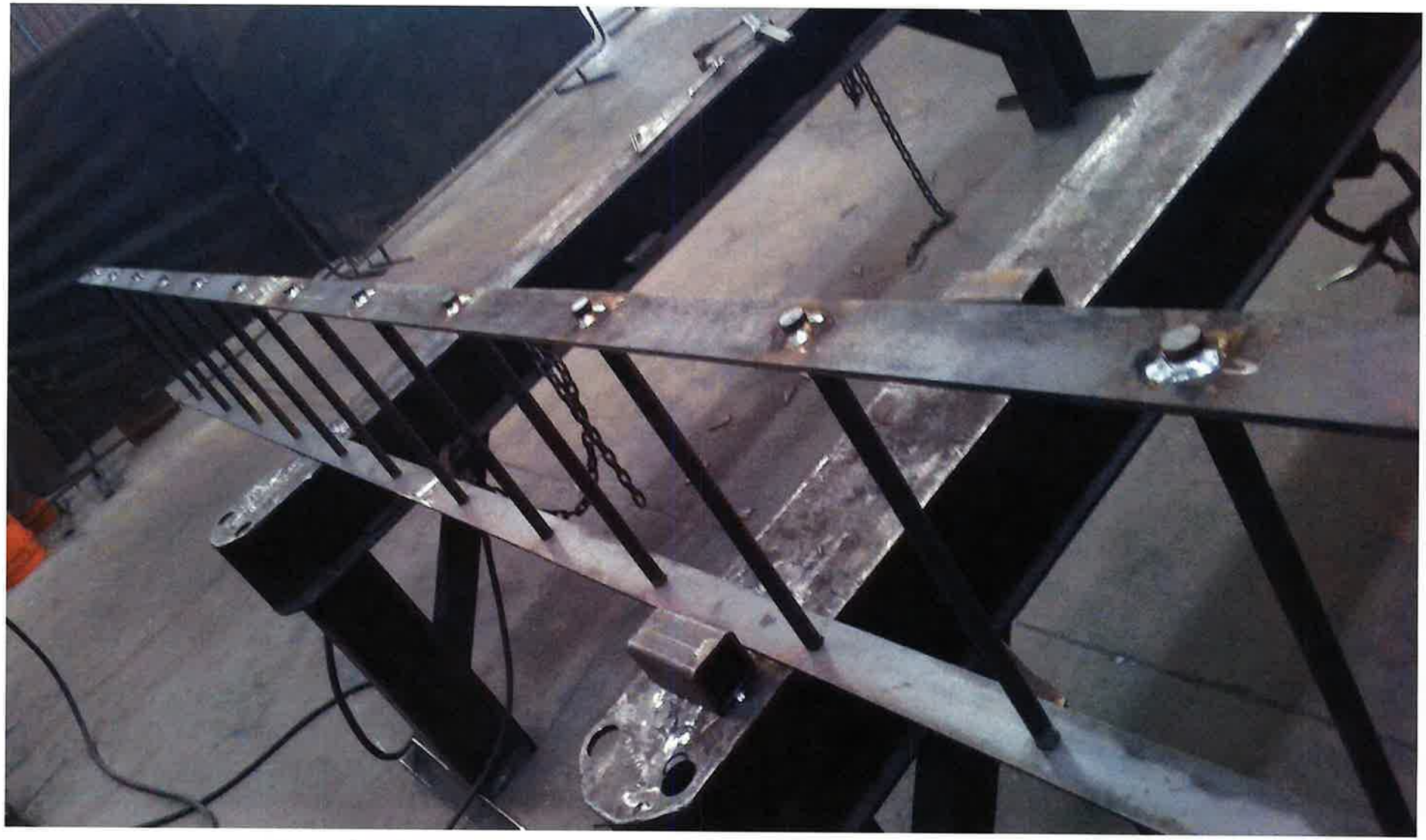

CW-01133-01

Welding Wire

Gas Flow

Machine Settings

Welder Certificate

Welder and Welding Operator Qualification Test Record

Southern Geotechnical Consultants

2660 White Sulphur Road – Gainesville, GA 30501 – 770.536.5220 – www.southemgeotech.com

Welder or welding operator's name Ismael Burciago Identification No. 079
Welding process GMAW Manual ____ Semiautomatic X Machine ____
Position 1G
(Flat, horizontal, overhead or vertical – if vertical, state whether upward or downward)
In accordance with procedure specification number B-U2a-GF (prequalified)
Material specification A572 Grade 50
Diameter and wall thickness (if pipe) – otherwise, joint thickness 1-inch
Diameter and thickness range this qualifies 1/8" to Unlimited
Positions this qualifies Flat (see Table 4.9, AWS D1.1)

FILLER MATERIAL

Specification No. AWS 5.18 Classification ER70S-6 F No. F4
Describe filler metal (if not covered by AWS specification) ____
Is backing strip used? N/A
Filler metal diameter and trade name .045"

Flux for submerged arc or gas for gas metal arc or flux cored arc welding 84% Argon and 16% Carbon Dioxide

VISUAL INSPECTION

Appearance Satisfactory Undercut none Piping porosity none

Test conducted by Rodney Clark Laboratory Test No. -
per AWS D1.1-2020 Test Date May 10, 2021

Fillet Test Results

Appearance ____ Fillet Size ____
Fracture test root penetration ____ Macroetch ____
(Describe the location, nature, and size or any crack or tearing of the specimen.)
Test conducted by Rodney Clark Laboratory Test No. -
per AWS D1.1-2020 Test Date May 10, 2021

RADIOGRAPHIC TEST RESULTS

Film Identification	Results	Remarks	Film Identification	Results	Remarks
IB-1	Satisfactory	Accept			

Test Witnessed By SGC (Rodney Clark)
Test Conducted By SGC (Rodney Clark)

We, the undersigned, certify that the statements in this record are correct and the welds were prepared and tested in accordance with the requirements of American Welding Society AWS D1.1-2010.

Manufacturer or contractor Metrosite Fabricators
Authorized By Kent Ramey
Date May 10, 2021

John R Clark
CWI 03120331
QC1 EXP. 12/1/2021

WPS Report

MetroSite LLC.
180 Industrial Park Blvd.
Commerce Georgia 30529

Welding Procedure Specification (WPS)

Date: 01/08/2019 Revision: 0

Supporting PQR: Prequalified Fillet F-1

Prepared By: D. Nichols Date:01/08/2019 Welding Engineer: _N/A

Welding Process: GMAW Welding Method: Spray Transfer

Joint Design Used:
Weld Type: _Single_____
Joint Type: __Fillet_____
Grove Type: __N/A_____
Double Welded: NO
Backing: _N/A_____ Material: _-_____
Root Opening: _N/A_____ Root Face: _N/A_____
Groove Angle: ___N/A_____ Radius: _N/A_____
Backing Gouging: N Method: _-_____

Tee Joint

Dennis J Nichols
CWI 13081701
QC1 EXP. 8/1/2019

Base Metals:
Base Metal: ASTM A 36, A 53 and A 65 and A 572 Gr.50
Thickness: Groove N/A_
Thickness: Fillet: ½"
Coating: __-_____

Position:
Weld Position: Groove _-_____
Weld Position: Fillet __FLAT_____
Vertical Progression: _-_____

Filler Metals:
AWS Specification: __A 5.18__
AWS Classification: __ER 70 S__
Trade Name: __Lincoln Sure Arc

Electrical Characteristics:
Current / Polarity: _DCEP_____
Transfer Mode: __SPRAY_____
Tungsten Electrode: Type__-____ Size _-____

Shielding:
Gas: 84% Ar, 16% CO2 Flow Rate: 30 to 40 Cfh
Gas Cup Size: 5/8 " to 7/8"
Electrode-Flux (Class) _F-4_____
Flux Trade Name: -_____

Technique:
Stringer or Weave Bead: _STRINGER__
Multi-pass or Single Pass: __Single_____
Number of Electrodes: __1_____
Electrode Spacing: Longitudinal __-_____
Lateral: __-_____ Angle: __-_____
Contact Tube to Work Distance: _-_____
Peening: ____None_____
Inter pass Cleaning: __-_____

Preheat:
Preheat Temperature, Min.: _____32F_____
Inter pass Temperature, Min.: 32F Max.: _350F____

Post-weld heat Treatment:
Temperature: _N/A_____
Time (hr.): __-_____

Parts shall be free of paint, oil, heavy oxides or any impurities detrimental to the welding process. Chip, grind or wire brush between passes.

Welding Procedure

Pass or Weld Layer(s)	Process	Filler Metal		Current		Wirespeed	Volts	Travel Speed (in/min)
		AWS Classification	Size (in.)	Type & Polarity	Amps			
1	GMAW	ER70S-6	.045	DC+	230 amps +/- 10%	365 ipm +/- 10%	25 Volts +/- 10%	15 imp +/- 15%

IFW-003 REV.001

Fabrication Letter

Metro Site Fabricators LLC.,
180 Industrial Park Blvd.
Commerce, GA 30529
(706)335-7045

Fabrication Letter

Customer: Structural Components
Site Name: Portland CT

This letter states that Metro Site provided materials in accordance with industry standards and contract documents provided to us by Structural Components. All structural steel met or exceeded the called-out grades per specifications. All galvanizing performed was in accordance with ASTM A123. All welding was in accordance with AISC and AWS D1.1 standards and work was completed by certified welders.

Kent Ramey

Kent Ramey
Fabrication Manager
180 Industrial Park Blvd.
Commerce GA 30529
706-335-7045

CWI Report

180 Industrial Park Blvd.
Commerce, Georgia 30529

WELDING INSPECTION REPORT

SITE NAME: Portland CT

Site Number: 1680

PREPAIRED FOR: Structural Components

PREPARED BY: Benjamin J Razevich

DATE: 06/08/2023

JOB NUMBER: 8952

CWI NAME: Benjamin J Razevich

CWI # 21087031

All weldment items have been reviewed Prefabrication, during fabrication, and post fabrication and meet or exceed the requirements listed in AWS D 1.1-2020.

REVISION: 1
STAMP:

CENTEK engineering

Centered on Solutions℠

Antenna Mount Analysis Report

Site Ref: Portland HS

97 High Street
Portland, CT

Centek Project No. 22017.06

~~Date: May 11, 2023~~
Rev 1: November 9, 2023

Max Stress Ratio = 44%

Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

CENTEK Engineering, Inc.
Mount Analysis
Verizon Site Ref. ~ Portand HS
Portland, CT
Rev 1 ~ November 9, 2023

Table of Contents

CENTEK engineering

Centered on Solutions℠

November 9, 2023

Mr. Phillip Cotto
Structure Consulting Group
49 Brattle Street
Arlington, Ma

Re: Structural Letter ~ Antenna Mount
Verizon – Site Ref: Portland HS
97 High Street
Portland, CT

Centek Project No. 22017.06

Dear Mr. Cotto,

Centek Engineering, Inc. has reviewed the Verizon antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the **proposed mount, consisting of three (3) V-frame sector mounts (SitePro P/N: VFA12-HD)** to support the proposed equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"*.

The loads considered in this analysis consist of the following:

- **Verizon:**
  V-Frames: Three (3) Commscope NNH4-65B-R6 panel antennas, three (3) Samsung MT6413-77A panel antennas, three (3) Samsung RT4423 panel antennas, three (3) Samsung RF4439d-25A (B2/B66A) RRHs, three (3) Samsung RF4461d-13A (B5/B13) RRHs, three (3) Samsung RF4423-48B RRHs and one (1) OVP Box mounted on three (3) V-Frames with a RAD center elevation of 90 ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 120 mph for Portland as required in Appendix P of the 2022 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

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Mount Analysis
Verizon Site Ref. ~ Portand HS
Portland, CT
Rev 1 ~ November 9, 2023

Section 2 - Calculations

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Subject:	TIA-222-H Loads
Location:	Portland, CT
Rev. 1: 11/9/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 120$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 90$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 90$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	Id := 56.00	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors = (Per Table 2-3 of TIA-222-H)

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1.15$$

$$I_{Seismic} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \\ 1.50 & \text{if } SC = 4 \end{cases} = 1.25$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.106$$

$$t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.271$$

Velocity Pressure Coefficient Antennas = $Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.238$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 43.16$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.493$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 2.697$

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Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope NNH4-65B-R6		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 71.969$	in	(User Input)
Appurtenance Width =	$W_{app} := 19.606$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 7.756$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 90$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 3.7$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.25$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 9.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 715$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 3.9$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 283$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 11.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 145$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 5.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 67$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 9.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 45$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 3.9$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 18$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 1 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 6053$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 196$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 196$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung MT6413-77A		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 28.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.75$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 5.51$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 60$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.8$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 221$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 77$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 48$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.8$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 21$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 14$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2508$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2124$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 69$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 69$	lbs

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Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RT4423		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 12.3$	in	(User Input)
Appurtenance Width =	$W_{app} := 8.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 1.4$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 3$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 52$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 8$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 1.2$	sf
Total Appurtenance Wind Force w/ Ice=	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 14$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total Appurtenance Wind Force w/ Ice=	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 5$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 3$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 1$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 150$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 508$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 16$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 16$	lbs

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Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4439-25A(B2/B66A)RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 15$	in	(User Input)
Appurtenance Width =	$W_{app} := 15$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 10$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 75$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 109$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 73$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 26$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 19$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 7$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2250$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1610$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot ld = 52$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 52$	lbs

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Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4461d-13A(B5/B13) RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 14.96$	in	(User Input)
Appurtenance Width =	$W_{app} := 14.96$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 10.23$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 80$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 109$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 74$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 26$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.6$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 19$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 7$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2289$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1623$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 53$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 53$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Samsung RF4423-48B RRH		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 11.8$	in	(User Input)
Appurtenance Width =	$W_{app} := 8.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 3.6$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 16$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 50$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 21$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 1.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 14$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.6$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 7$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 3$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 1$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 370$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 621$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 20$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 20$	lbs

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Subject:	TIA-222-H Loads
Location:	Portland, CT
Rev. 1: 11/9/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	OVP Box		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 29.5$	in	(User Input)
Appurtenance Width =	$W_{app} := 16.5$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 12.6$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 32$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.8$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 236$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 180$	lbs

Wind Load (with ice)

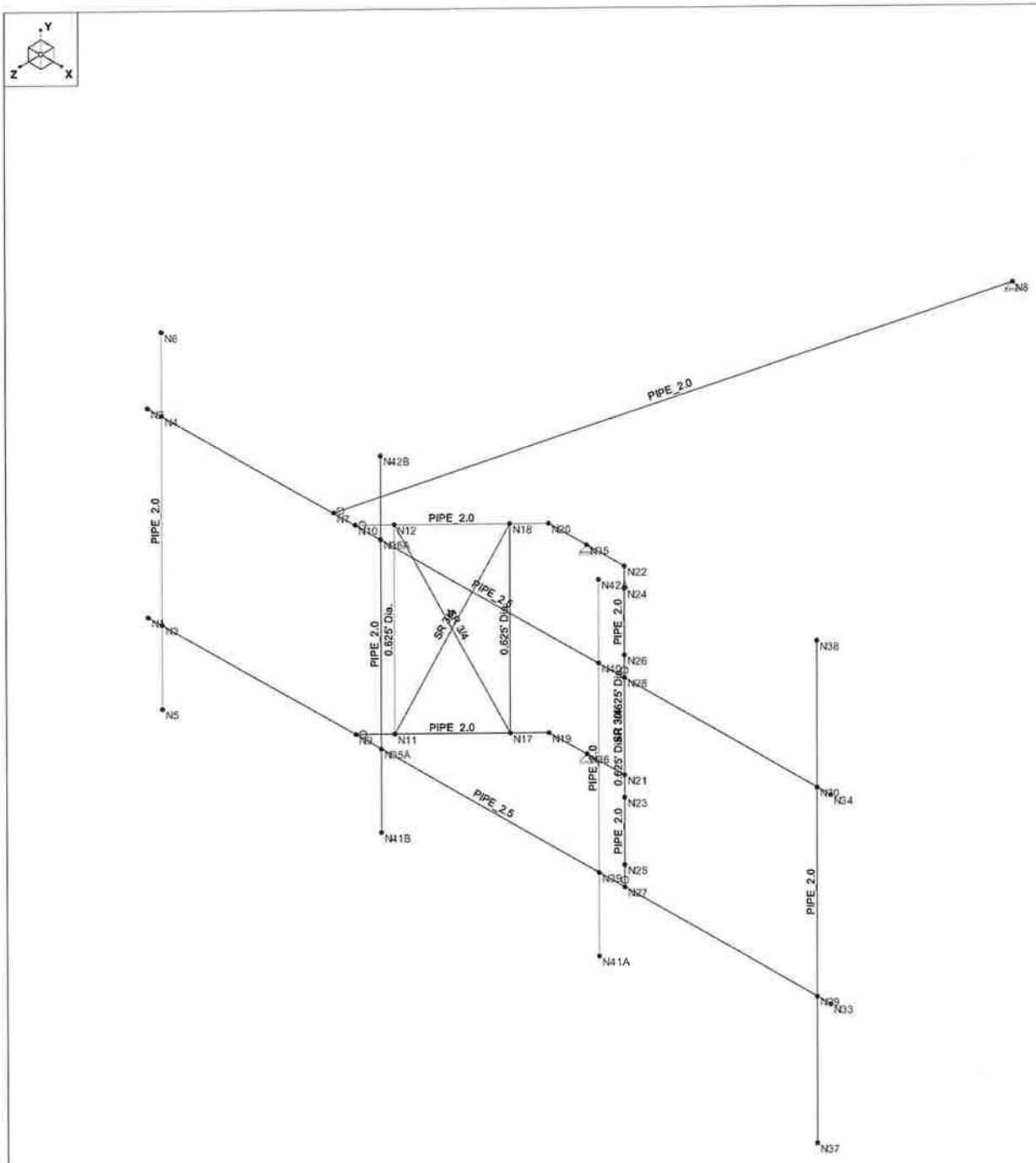
Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 4.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 51$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 41$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 3.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 15$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 11$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 6133$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 3107$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 101$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 101$	lbs



Envelope Only Solution

Centek Engineering	Portland HS	Nov 9, 2023 at 8:58 AM
TJL	Member Framing	Mount.R3D
22017.06		

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast_2.0...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Horizontal_2.5 ST...	PIPE_2.5	Beam	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
3	Outrigger_2.0 ST...	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Stabilizer_2.0 ST...	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	0.625" Dia. Bar	0.625' Dia.	Column	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	0.75"Dia. Bar	SR 3/4	Column	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
2	M2	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
3	M3	Stabilizer_2.0 STD ...	10.18			Lbyy						Lateral
4	M4	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
5	M5	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
6	M6	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
7	M7	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
8	M8	0.625" Dia. Bar	3.333									Lateral
9	M9	0.625" Dia. Bar	3.333									Lateral
10	M10	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
11	M11	0.625" Dia. Bar	3.333									Lateral
12	M12	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
13	M13	0.625" Dia. Bar	3.333									Lateral
14	M14	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
15	M15	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
16	PS.2	Antenna Mast_2.0 ...	6			Lbyy						Lateral
17	PS.1	Antenna Mast_2.0 ...	8			Lbyy						Lateral
18	M19	Antenna Mast_2.0 ...	6			Lbyy						Lateral
19	M21A	Antenna Mast_2.0 ...	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N2	N34			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
2	M2	N1	N33			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
3	M3	N7	N8			Stabilizer_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
4	M4	N10	N20			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
5	M5	N9	N19			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
6	M6	N28	N22			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
7	M7	N27	N21			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
8	M8	N12	N11			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
9	M9	N18	N17			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
10	M10	N12	N17			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
11	M11	N26	N25			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
12	M12	N18	N11			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
13	M13	N24	N23			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
14	M14	N26	N23			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
15	M15	N24	N25			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
16	PS.2	N5	N6			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
17	PS.1	N37	N38			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
18	M19	N41A	N42A			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
19	M20	N19	N21			RIGID	None	None	RIGID	Typical
20	M21	N20	N22			RIGID	None	None	RIGID	Typical
21	M21A	N41B	N42B			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0.	-0.	0	
2	N2	0	3.333334	-0.	0	
3	N3	.25	0.	-0.	0	
4	N4	.25	3.333334	-0.	0	
5	N5	.25	-1.333333	-0.	0	
6	N6	.25	4.666667	-0.	0	
7	N7	3.390625	3.333334	-0.	0	
8	N8	6.025403	3.333334	-9.833125	0	
9	N9	3.78125	0.	-0.	0	
10	N10	3.78125	3.333334	-0.	0	
11	N11	4.138628	0.	-0.357378	0	
12	N12	4.138628	3.333334	-0.357378	0	
13	N17	5.206335	0.	-1.425085	0	
14	N18	5.206335	3.333334	-1.425085	0	
15	N19	5.563713	0.	-1.782463	0	
16	N20	5.563713	3.333334	-1.782463	0	
17	N21	6.936287	0.	-1.782463	0	
18	N22	6.936287	3.333334	-1.782463	0	
19	N23	7.293665	0.	-1.425085	0	
20	N24	7.293665	3.333334	-1.425085	0	
21	N25	8.361372	0.	-0.357378	0	
22	N26	8.361372	3.333334	-0.357378	0	
23	N27	8.71875	0.	-0.	0	
24	N28	8.71875	3.333334	-0.	0	
25	N29	12.25	0.	-0.	0	
26	N30	12.25	3.333334	-0.	0	
27	N33	12.5	0.	-0.	0	
28	N34	12.5	3.333334	-0.	0	
29	N35	6.25	3.333334	-1.782463	0	
30	N36	6.25	0.	-1.782463	0	
31	N35A	4.25	0.	-0.	0	
32	N36A	4.25	3.333334	-0.	0	
33	N37	12.25	-2.333333	0	0	
34	N38	12.25	5.666667	0	0	
35	N39	8.25	0.	-0.	0	
36	N40	8.25	3.333334	-0.	0	
37	N41A	8.25	-1.333333	-0.	0	
38	N42A	8.25	4.666667	-0.	0	
39	N41B	4.25	-1.333333	-0.	0	
40	N42B	4.25	4.666667	-0.	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N19						
3	N20						
4	N17						
5	N18						
6	N21						
7	N22						
8	N23						
9	N24						
10	N35	Reaction	Reaction	Reaction			
11	N36	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.045	1.5
2	PS.1	Y	-.045	6.5
3	PS.2	Y	-.03	2
4	PS.2	Y	-.03	4
5	PS.1	Y	-.075	3
6	PS.1	Y	-.08	5
7	M21A	Y	-.016	1
8	M19	Y	-.032	%50
9	M21A	Y	-.003	%50

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.098	1.5
2	PS.1	Y	-.098	6.5
3	PS.2	Y	-.035	2
4	PS.2	Y	-.035	4
5	PS.1	Y	-.052	3
6	PS.1	Y	-.053	5
7	M21A	Y	-.02	1
8	M19	Y	-.101	%50
9	M21A	Y	-.016	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.034	1.5
2	PS.1	X	.034	6.5
3	PS.2	X	.011	2
4	PS.2	X	.011	4
5	PS.1	X	.019	3
6	PS.1	X	.019	5
7	M21A	X	.007	1
8	M19	X	.041	%50
9	M21A	X	.005	%50

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.142	1.5
2	PS.1	X	.142	6.5
3	PS.2	X	.039	2
4	PS.2	X	.039	4
5	PS.1	X	.073	3
6	PS.1	X	.074	5
7	M21A	X	.021	1
8	M19	X	.18	%50
9	M21A	X	.008	%50

Member Point Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.009	1.5
2	PS.1	X	.009	6.5
3	PS.2	X	.003	2
4	PS.2	X	.003	4
5	PS.1	X	.005	3
6	PS.1	X	.005	5
7	M21A	X	.001	1
8	M19	X	.011	%50
9	M21A	X	.001	%50

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.073	1.5
2	PS.1	Z	.073	6.5
3	PS.2	Z	.024	2
4	PS.2	Z	.024	4
5	M19	Z	.051	%50
6	M21A	Z	.014	%50

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.358	1.5
2	PS.1	Z	.358	6.5
3	PS.2	Z	.111	2
4	PS.2	Z	.111	4
5	M19	Z	.236	%50
6	M21A	Z	.052	%50

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.023	1.5
2	PS.1	Z	.023	6.5
3	PS.2	Z	.007	2
4	PS.2	Z	.007	4
5	M19	Z	.015	%50
6	M21A	Z	.003	%50

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.003	.003	0	0
2	M4	X	.003	.003	0	0
3	M5	X	.003	.003	0	0
4	M6	X	.003	.003	0	0
5	M7	X	.003	.003	0	0
6	M8	X	.003	.003	0	0
7	M9	X	.003	.003	0	0
8	M10	X	.003	.003	0	0
9	M11	X	.003	.003	0	0
10	M12	X	.003	.003	0	0
11	M13	X	.003	.003	0	0
12	M14	X	.003	.003	0	0
13	M15	X	.003	.003	0	0
14	PS.2	X	.003	.003	0	0
15	PS.1	X	.003	.003	0	0
16	M19	X	.003	.003	0	0
17	M20	X	.003	.003	0	0
18	M21	X	.003	.003	0	0
19	M21A	X	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.018	.018	0	0
2	M4	X	.018	.018	0	0
3	M5	X	.018	.018	0	0
4	M6	X	.018	.018	0	0
5	M7	X	.018	.018	0	0
6	M8	X	.018	.018	0	0
7	M9	X	.018	.018	0	0
8	M10	X	.018	.018	0	0
9	M11	X	.018	.018	0	0
10	M12	X	.018	.018	0	0
11	M13	X	.018	.018	0	0
12	M14	X	.018	.018	0	0
13	M15	X	.018	.018	0	0
14	PS.2	X	.018	.018	0	0
15	PS.1	X	.018	.018	0	0
16	M19	X	.018	.018	0	0
17	M20	X	.018	.018	0	0
18	M21	X	.018	.018	0	0
19	M21A	X	.018	.018	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M3	X	.003	.003	0	0
2	M4	X	.003	.003	0	0
3	M5	X	.003	.003	0	0
4	M6	X	.003	.003	0	0
5	M7	X	.003	.003	0	0
6	M8	X	.003	.003	0	0

Member Distributed Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
7	M9	X	.003	.003	0	0
8	M10	X	.003	.003	0	0
9	M11	X	.003	.003	0	0
10	M12	X	.003	.003	0	0
11	M13	X	.003	.003	0	0
12	M14	X	.003	.003	0	0
13	M15	X	.003	.003	0	0
14	PS.2	X	.003	.003	0	0
15	PS.1	X	.003	.003	0	0
16	M19	X	.003	.003	0	0
17	M20	X	.003	.003	0	0
18	M21	X	.003	.003	0	0
19	M21A	X	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.003	.003	0	0
2	M2	Z	.003	.003	0	0
3	M3	Z	.003	.003	0	0
4	M4	Z	.003	.003	0	0
5	M5	Z	.003	.003	0	0
6	M6	Z	.003	.003	0	0
7	M7	Z	.003	.003	0	0
8	M8	Z	.003	.003	0	0
9	M9	Z	.003	.003	0	0
10	M10	Z	.003	.003	0	0
11	M11	Z	.003	.003	0	0
12	M12	Z	.003	.003	0	0
13	M13	Z	.003	.003	0	0
14	M14	Z	.003	.003	0	0
15	M15	Z	.003	.003	0	0
16	PS.2	Z	.003	.003	0	0
17	M19	Z	.003	.003	0	0
18	M20	Z	.003	.003	0	0
19	M21	Z	.003	.003	0	0
20	M21A	Z	.003	.003	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.018	.018	0	0
2	M2	Z	.018	.018	0	0
3	M3	Z	.018	.018	0	0
4	M4	Z	.018	.018	0	0
5	M5	Z	.018	.018	0	0
6	M6	Z	.018	.018	0	0
7	M7	Z	.018	.018	0	0
8	M8	Z	.018	.018	0	0
9	M9	Z	.018	.018	0	0
10	M10	Z	.018	.018	0	0
11	M11	Z	.018	.018	0	0
12	M12	Z	.018	.018	0	0

Member Distributed Loads (BLC 10 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
13	M13	Z	.018	.018	0	0
14	M14	Z	.018	.018	0	0
15	M15	Z	.018	.018	0	0
16	PS.2	Z	.018	.018	0	0
17	M19	Z	.018	.018	0	0
18	M20	Z	.018	.018	0	0
19	M21	Z	.018	.018	0	0
20	M21A	Z	.018	.018	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.003	.003	0	0
2	M2	Z	.003	.003	0	0
3	M3	Z	.003	.003	0	0
4	M4	Z	.003	.003	0	0
5	M5	Z	.003	.003	0	0
6	M6	Z	.003	.003	0	0
7	M7	Z	.003	.003	0	0
8	M8	Z	.003	.003	0	0
9	M9	Z	.003	.003	0	0
10	M10	Z	.003	.003	0	0
11	M11	Z	.003	.003	0	0
12	M12	Z	.003	.003	0	0
13	M13	Z	.003	.003	0	0
14	M14	Z	.003	.003	0	0
15	M15	Z	.003	.003	0	0
16	PS.2	Z	.003	.003	0	0
17	M19	Z	.003	.003	0	0
18	M20	Z	.003	.003	0	0
19	M21	Z	.003	.003	0	0
20	M21A	Z	.003	.003	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					9			
3	Ice Load	None					9			
4	Lm Maintenance Load (500lb)	None								
5	Lv Maintenance Load (250lb)	None								
6	Wind with Ice X	None					9	19		
7	Wind X	None					9	19		
8	Wm Wind X	None					9	19		
9	Wind with Ice Z	None					6	20		
10	Wind Z	None					6	20		
11	Wm Wind Z	None					6	20		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
1	1.4D	Yes	Y		1	1.4	2	1.4																
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5														
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1														
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
5	1.2D +1.5Lm+ 1.0W m ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1												
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1														
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1												
8	1.2D +1.5Lm+ 1.0W m ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	.233	3	.025	1	.919	6	0	8	0	8	0	8
2		min	-.271	6	.021	3	-1.212	3	0	1	0	1	0	1
3	N35	max	-.133	6	.687	7	.804	3	0	8	0	8	0	8
4		min	-1.769	3	.384	3	-2.878	6	0	1	0	1	0	1
5	N36	max	.86	7	.658	4	.68	4	0	8	0	8	0	8
6		min	-.568	3	.247	6	-.958	6	0	1	0	1	0	1
7	Totals:	max	0	8	1.335	4	0	3						
8		min	-2.104	3	.827	8	-2.918	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	.063	3	.035	6	.3	6	3.976e-03	6	1.2e-02	6	9.437e-04	3
2		min	-.115	6	-.031	3	-.035	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
3	N2	max	.036	3	.035	6	.452	6	2.539e-03	6	1.23e-02	6	1.072e-03	3
4		min	-.045	6	-.032	3	-.009	4	-2.295e-03	3	-3.806e-04	4	-9.84e-04	6
5	N3	max	.063	3	.032	7	.264	6	3.976e-03	6	1.2e-02	6	9.436e-04	3
6		min	-.115	6	-.028	3	-.034	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
7	N4	max	.036	3	.032	7	.415	6	2.539e-03	6	1.23e-02	6	1.072e-03	3
8		min	-.045	6	-.028	3	-.008	4	-2.295e-03	3	-3.806e-04	4	-9.84e-04	6
9	N5	max	.079	3	.032	7	.201	6	3.906e-03	6	1.2e-02	6	1.014e-03	3
10		min	-.13	6	-.028	3	-.045	1	-2.189e-03	3	-4.5e-04	4	-9.599e-04	6
11	N6	max	.02	3	.032	7	.456	6	2.609e-03	6	1.23e-02	6	1.002e-03	3
12		min	-.029	6	-.028	3	-.041	3	-2.295e-03	3	-3.806e-04	4	-9.841e-04	6
13	N7	max	.036	3	.034	7	.016	3	1.447e-03	6	9.639e-03	6	6.175e-04	3
14		min	-.045	6	.011	3	-.018	6	-1.158e-03	3	-1.301e-03	3	-2.923e-04	6
15	N8	max	0	8	0	8	0	8	1.91e-03	1	7.888e-03	3	1.312e-03	3
16		min	0	1	0	1	0	1	1.435e-03	3	5.127e-05	2	-1.996e-04	6
17	N9	max	.062	3	.033	7	.082	3	2.235e-03	6	5.246e-03	6	3.777e-04	3
18		min	-.115	6	.013	3	-.152	6	-8.113e-04	3	-4.928e-04	1	-4.431e-04	6
19	N10	max	.036	3	.033	7	.023	3	1.311e-03	6	8.501e-03	6	3.855e-04	3
20		min	-.045	6	.013	3	-.061	6	-1.017e-03	3	-1.196e-03	3	-4.005e-04	7
21	N11	max	.05	3	.037	7	.069	3	2.019e-03	6	2.987e-03	3	1.281e-04	3
22		min	-.09	6	.013	3	-.127	6	-5.166e-04	3	-5.778e-03	6	-8.88e-04	6
23	N12	max	.024	3	.037	7	.012	3	1.391e-03	6	2.666e-03	3	4.435e-04	3
24		min	-.036	6	.013	3	-.053	6	-7.218e-04	3	-2.003e-03	6	-5.474e-04	7
25	N17	max	.011	3	.036	7	.031	3	1.191e-03	6	2.786e-03	3	-4.683e-04	3
26		min	-.02	6	.004	3	-.058	6	1.051e-04	3	-4.897e-03	6	-2.42e-03	7

Envelope Joint Displacements (Continued)

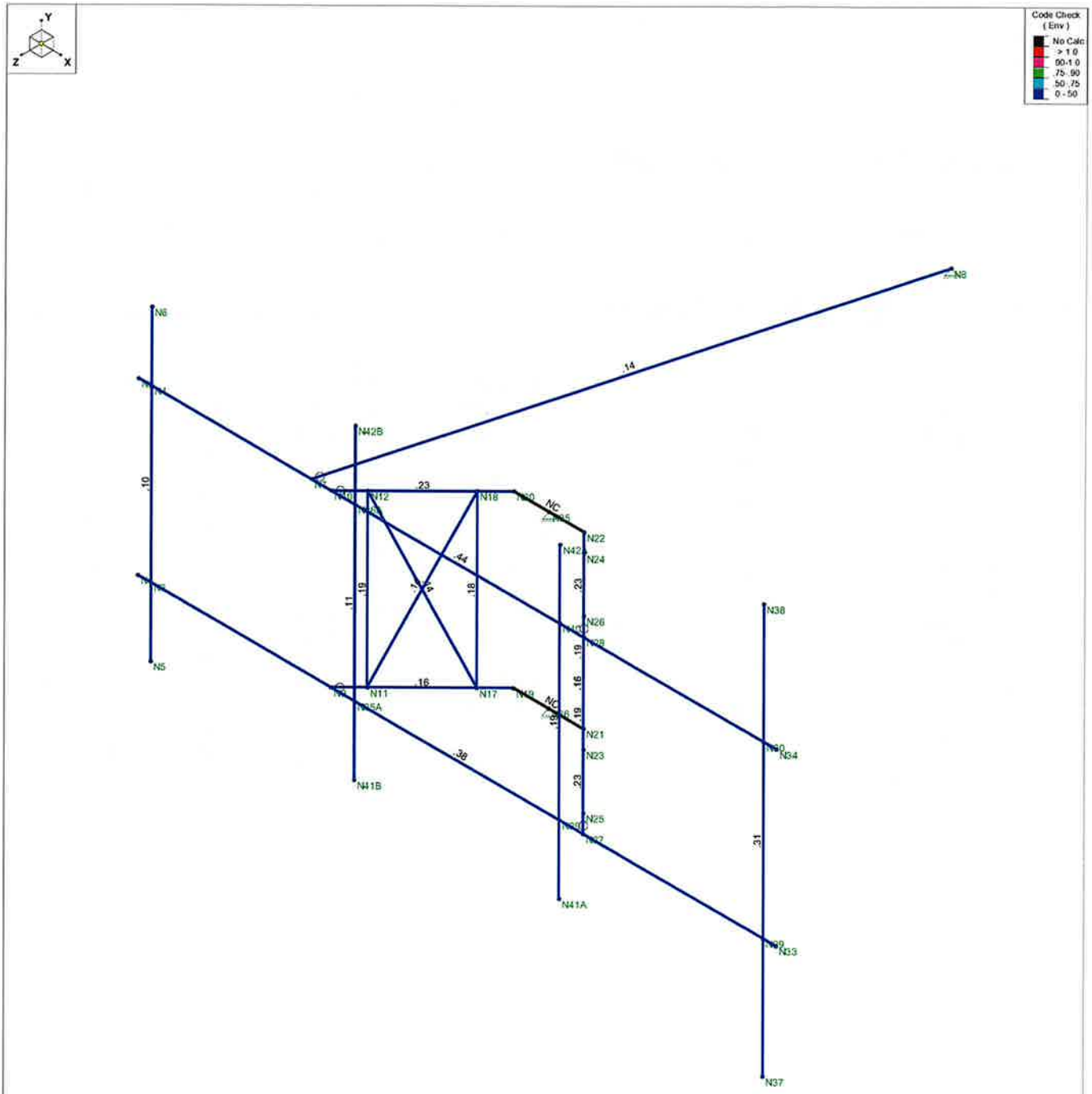
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
27	N18	max	0	3	.036	7	-.005	2	1.01e-03	7	4.415e-04	3	-2.46e-04	3
28		min	-.01	6	.004	3	-.029	6	-5.278e-05	3	-2.066e-03	6	-2.361e-03	7
29	N19	max	0	8	.027	7	.02	3	6.829e-04	7	2.43e-03	3	-4.687e-04	3
30		min	0	1	.004	3	-.038	6	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
31	N20	max	0	8	.027	7	-.004	2	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
32		min	0	1	.004	3	-.02	6	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
33	N21	max	0	8	-.004	3	.038	6	6.829e-04	7	2.43e-03	3	-4.687e-04	3
34		min	0	1	-.027	7	-.02	3	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
35	N22	max	0	8	-.004	3	.02	6	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
36		min	0	1	-.027	7	.004	2	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
37	N23	max	.011	3	-.008	3	.059	6	2.79e-04	3	2.787e-03	3	-6.364e-04	3
38		min	-.021	6	-.042	7	-.031	3	-3.293e-04	6	-5.187e-03	6	-2.611e-03	7
39	N24	max	-.001	3	-.008	3	.03	6	5.174e-04	3	5.077e-04	3	-3.814e-04	3
40		min	-.01	6	-.042	7	.005	2	-5.375e-04	6	-2.405e-03	6	-2.64e-03	7
41	N25	max	.049	3	-.019	3	.131	6	4.08e-04	3	3.007e-03	3	-1.206e-03	3
42		min	-.092	6	-.049	7	-.069	3	-1.606e-03	6	-5.675e-03	6	-2.55e-03	7
43	N26	max	.024	3	-.019	3	.06	6	5.829e-04	3	2.813e-03	3	-5.439e-04	3
44		min	-.038	6	-.049	7	-.014	3	-1.67e-03	6	-2.047e-03	6	-2.545e-03	7
45	N27	max	.062	3	-.028	3	.155	6	9.807e-04	3	3.068e-03	3	-1.82e-03	3
46		min	-.116	6	-.057	7	-.082	3	-1.518e-03	6	-1.661e-02	6	-3.895e-03	7
47	N28	max	.037	3	-.025	3	.069	6	1.105e-03	3	2.157e-03	3	-1.342e-03	3
48		min	-.046	6	-.057	7	-.027	3	-1.011e-03	6	-1.498e-02	6	-3.91e-03	7
49	N29	max	.062	3	-.12	3	1.127	6	1.489e-03	3	2.584e-03	3	-7.332e-04	3
50		min	-.116	6	-.296	7	-.198	3	-4.803e-03	6	-2.599e-02	6	-4.428e-03	7
51	N30	max	.037	3	-.12	3	1.022	6	1.555e-03	3	2.602e-03	3	-1.698e-03	3
52		min	-.046	6	-.296	7	-.131	3	-6.971e-04	7	-2.611e-02	6	-4.426e-03	7
53	N33	max	.062	3	-.122	3	1.205	6	1.489e-03	3	2.584e-03	3	-7.333e-04	3
54		min	-.116	6	-.31	7	-.206	3	-4.803e-03	6	-2.599e-02	6	-4.428e-03	7
55	N34	max	.037	3	-.125	3	1.1	6	1.555e-03	3	2.602e-03	3	-1.698e-03	3
56		min	-.046	6	-.31	7	-.139	3	-6.971e-04	7	-2.611e-02	6	-4.426e-03	7
57	N35	max	0	8	0	8	0	8	6.565e-04	7	-5.094e-04	2	-4.791e-04	3
58		min	0	1	0	1	0	1	4.026e-04	6	-2.371e-03	6	-3.328e-03	7
59	N36	max	0	8	0	8	0	8	6.829e-04	7	2.43e-03	3	-4.687e-04	3
60		min	0	1	0	1	0	1	3.857e-04	3	-4.619e-03	6	-3.33e-03	7
61	N35A	max	.062	3	.03	4	.072	3	1.958e-03	6	3.444e-03	6	1.989e-04	3
62		min	-.115	6	.012	6	-.176	6	-7.375e-04	3	-5.307e-04	1	-7.034e-04	7
63	N36A	max	.036	3	.03	4	.028	3	1.14e-03	6	6.615e-03	6	1.487e-04	3
64		min	-.045	6	.012	6	-.104	6	-8.946e-04	3	-6.161e-04	3	-6.81e-04	7
65	N37	max	.062	3	-.12	3	1.292	6	1.488e-03	3	2.584e-03	3	1.322e-04	3
66		min	-.206	6	-.296	7	-.24	3	-6.029e-03	6	-2.599e-02	6	-4.418e-03	7
67	N38	max	.14	4	-.12	3	1.06	6	1.556e-03	3	2.602e-03	3	-2.2e-03	2
68		min	.043	6	-.296	7	-.087	3	-4.472e-04	7	-2.611e-02	6	-4.435e-03	7
69	N39	max	.062	3	-.018	6	.069	6	9.05e-04	3	3.152e-03	3	-1.268e-03	3
70		min	-.116	6	-.038	4	-.065	3	-1.203e-03	6	-1.414e-02	6	-2.813e-03	7
71	N40	max	.037	3	-.018	6	-.002	2	9.904e-04	3	2.038e-03	3	-7.735e-04	3
72		min	-.046	6	-.038	4	-.015	3	-1.206e-03	6	-1.214e-02	6	-2.824e-03	7
73	N41A	max	.043	3	-.018	6	.089	6	9.05e-04	3	3.152e-03	3	-1.198e-03	3
74		min	-.144	6	-.038	4	-.079	3	-1.273e-03	6	-1.414e-02	6	-2.813e-03	7
75	N42A	max	.061	4	-.018	6	.001	3	9.904e-04	3	2.038e-03	3	-8.439e-04	3
76		min	-.017	6	-.038	4	-.026	6	-1.135e-03	6	-1.214e-02	6	-2.824e-03	7
77	N41B	max	.067	3	.03	4	.084	3	1.887e-03	6	3.444e-03	6	2.808e-04	3
78		min	-.125	6	.012	6	-.207	6	-7.374e-04	3	-5.307e-04	1	-7.032e-04	7

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
79	N42B	max	.034	3	.03	4	.017	4	1.211e-03	6	6.615e-03	6	7.826e-05	3
80		min	-.036	6	.012	6	-.085	6	-8.947e-04	3	-6.161e-04	3	-6.81e-04	7

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

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...	phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M1	PIPE_2.5	.444	8....	6	.109	3.776		6	14.559	50.715	3.596	3.5...	2....	H1...
2	M2	PIPE_2.5	.383	8....	6	.094	8.724		6	14.559	50.715	3.596	3.5...	2....	H1...
3	M3	PIPE_2.0	.143	5....	3	.009	10.18		3	9.492	32.13	1.872	1.8...	1....	H1...
4	M4	PIPE_2.0	.228	2....	3	.084	2.521		3	32.032	32.13	1.872	1.8...	1....	H1...
5	M5	PIPE_2.0	.160	2....	7	.068	2.521		4	32.032	32.13	1.872	1.8...	1....	H1...
6	M6	PIPE_2.0	.231	2....	7	.086	.499		7	32.032	32.13	1.872	1.8...	1....	H1...
7	M7	PIPE_2.0	.226	2....	7	.091	.499		7	32.032	32.13	1.872	1.8...	1....	H1...
8	M8	0.625' Dia.	.190	3....	6	.024	3.333		6	1.058	9.94	.104	.104	2....	H1...
9	M9	0.625' Dia.	.177	0	3	.019	0		6	1.058	9.94	.104	.104	2....	H1...
10	M10	SR 3/4	.141	0	3	.020	0		6	6.954	14.314	.179	.179	1	H1...
11	M11	0.625' Dia.	.194	0	3	.023	0		6	1.058	9.94	.104	.104	2....	H1...
12	M12	SR 3/4	.144	0	3	.021	0		6	6.954	14.314	.179	.179	2....	H1...
13	M13	0.625' Dia.	.194	0	3	.019	0		6	1.058	9.94	.104	.104	2....	H1...
14	M14	SR 3/4	.158	0	3	.017	0		6	6.954	14.314	.179	.179	2....	H1...
15	M15	SR 3/4	.151	0	3	.018	0		6	6.954	14.314	.179	.179	1	H1...
16	PS.2	PIPE_2.0	.097	1....	6	.027	1.375		6	20.867	32.13	1.872	1.8...	1....	H1...
17	PS.1	PIPE_2.0	.311	5....	4	.039	5.667		6	14.916	32.13	1.872	1.8...	4....	H1...
18	M19	PIPE_2.0	.195	4....	3	.058	4.625		6	20.867	32.13	1.872	1.8...	1....	H1...
19	M21A	PIPE_2.0	.113	1....	6	.071	1.375		6	20.867	32.13	1.872	1.8...	1....	H1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering		
TJL	Portland HS	Nov 9, 2023 at 8:57 AM
22017.06	Unity Check	Mount.R3D

CENTEK engineering
Centered on Solutions™
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Subject:	Connection to Host Structure
Location:	Portland, CT
Rev. 0: 5/11/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22017.06

Antenna Mount Connection:

Anchor Data:

A307 Threaded Rod =

Number of Anchor Bolts = $N := 4$ (User Input)

Diameter of Bolts = $D := 0.625in$ (User Input)

Design Tension = $T_{design} := 10.4 \cdot kips$ (User Input)

Design Shear = $V_{design} := 6.23 \cdot kips$ (User Input)

Design Reactions:

Fx = $F_x := 1.7 \cdot kips$ (User Input)

Fy = $F_y := 0.7 \cdot kips$ (User Input)

Fz = $F_z := 2.8 \cdot kips$ (User Input)

Anchor Check:

Max Tension Force = $T_{Max} := \frac{F_z}{N} = 700\,lb$

Max Shear Force = $V_{Max} := \frac{F_y}{N} + \frac{F_x}{N} = 600\,lb$

Condition 1 = $Condition1 := if\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, "OK", "NG"\right) = "OK"$

% of Capacity = $\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 16.4 \cdot \%$

verizon
NPP RFDS

NORTHEAST > North East > New England > Wallingford-1 > PORTLAND HS CT - B

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Project Details		Location Information	
Carrier Aggregation	N	Site Id	616480547
Ecip	N	Search Ring#	
Project Name	PORTLAND HS CT	E-NodeB ID#	null
Project Alt Name	PORTLAND HS CT	PSLC#	469381
Project Id	16599668	Switch Name	Wallingford-1
Designed Sector Carrier 4G	15	Tower Type	
Designed Sector Carrier 5G	3	Site Type	MACRO
Additional Sector Carrier 4G	0	Street Address	97 High Street
Additional Sector Carrier 5G	0	City	Portland
Suffix	Rev4-2023-09-27	State	CT
FP Solution Type & Tech Type	MCR;4G_700;4G_850;4G_AWS;4G_CBRS;5G_L-Sub6;4G_PCS	Zip Code	06480
		County	Middlesex
		Latitude	41.58071/ 41° 34' 50.556"
		Longitude	-72.63136/ 72° 37' 52.896"

Project Scope

Rev4-2023-09-27
Use RF4461d-13A low band RRH and 6413 C-Band MMU

Antenna Summary

Added Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit
					5G	Samsung	MT6413-77A	90	91.2	30(1),150(2),270(3)	PHYSICAL	3
LTE	LTE	LTE	LTE			COMMSCOPE	NNH4-65B-R6	90	93	30(1),150(2),270(3)	PHYSICAL	3
				LTE		Samsung	RT4423	90	90.4	30(19),150(20),270(21)	PHYSICAL	3

Removed Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Retained Antenna

700	850	1900	AWS	CBRS	L-Sub6	Make	Model	Center line	Tip Height	Azimuth	Install Type	Quantit

Added: 9	Removed: 0	Retained: 0

Non Antenna Summary

Added Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity
Hybrid Cable	Tower						Hybrid Cables	1-1/4" Hybrid Cables	PHYSICAL	2
OVP	Tower							12 OVP	PHYSICAL	1
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH ORAN (RF4439d-25A)	PHYSICAL	3
RRU	Tower					LTE	Samsung	RF4423-48B	PHYSICAL	3
RRU	Tower	LTE	LTE				Samsung	RF4461d-13A	PHYSICAL	3

Removed Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Retained Non Antenna

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity

Added: 12	Removed: 0	Retained: 0

Services				
700 LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		5230	5230	5230
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		66.49 (W/MHz) ERP	66.49 (W/MHz) ERP	66.49 (W/MHz) ERP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11232662	11232663	11232664
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services				
850 LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		2450	2450	2450
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD	301.17 (W/MHz) ERPSD
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		RF4461d-13A	RF4461d-13A	RF4461d-13A
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298595	11298596	11298597
Source		VZNPP	VZNPP	VZNPP
Bandwidth		10	10	10
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services		
1900 LTE		**0002 (8118082)**

Sector	01	02	03
Azimuth	30	150	270
Cell/Enodeb-Id	064040	064040	064040
Antenna Model	NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline	90	90	90
DLEARFCN	1050	1050	1050
Mech Down-tilt	0	0	0
Elect Down-tilt	2	2	2
Tip Height	93	93	93
Regulatory Power	168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP	168.95 (W/MHz) EIRP
Cell Max Power	46.0 dBm	46.0 dBm	46.0 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx	4 , 4	4 , 4	4 , 4
Position			
Transmitter Id	11298592	11298593	11298594
Source	VZNPP	VZNPP	VZNPP
Bandwidth	10	10	10
Ant. Dimensions H x W x D(inch)	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)	81.82	81.82	81.82

Services				
AWS LTE		**0002 (8118082)**		
Sector		01	02	03
Azimuth		30	150	270
Cell/Enodeb-Id		064040	064040	064040
Antenna Model		NNH4-65B-R6	NNH4-65B-R6	NNH4-65B-R6
Antenna Make		COMMSCOPE	COMMSCOPE	COMMSCOPE
Centerline		90	90	90
DLEARFCN		2050	2050	2050
Mech Down-tilt		0	0	0
Elect Down-tilt		2	2	2
Tip Height		93	93	93
Regulatory Power		84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP	84.67 (W/MHz) EIRP
Cell Max Power		46.0 dBm	46.0 dBm	46.0 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx,Rx		4 , 4	4 , 4	4 , 4
Position				
Transmitter Id		11298467	11298468	11298469
Source		VZNPP	VZNPP	VZNPP
Bandwidth		20	20	20
Ant. Dimensions H x W x D(inch)		72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79	72.0 x 19.6 x 7.79
Weight(lb)		81.82	81.82	81.82

Services		
CBRS LTE		**0002 (8118082)**

Sector	19	20	21
Azimuth	30	150	270
Cell/Enodeb-Id	064040	064040	064040
Antenna Model	RT4423	RT4423	RT4423
Antenna Make	Samsung	Samsung	Samsung
Centerline	90	90	90
DLEARFCN	55343, 55541, 55739, 55937	55343, 55541, 55739, 55937	55343, 55541, 55739, 55937
Mech Down-tilt	0	0	0
Elect Down-tilt	7	7	7
Tip Height	90.4	90.4	90.4
Regulatory Power	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)	3.76 (W/MHz) EIRPSD, 3.76 (W/MHz) EIRPSD, 3.76 (W/MHz)
Cell Max Power	37.02 dBm	37.02 dBm	37.02 dBm
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	RF4423-48B	RF4423-48B	RF4423-48B
Number of Tx,Rx	4 , 4	4 , 4	4 , 4
Position			
Transmitter Id	11298781	11298782	11298783
Source	VZNPP	VZNPP	VZNPP
Bandwidth	20, 20, 20, 20	20, 20, 20, 20	20, 20, 20, 20
Ant. Dimensions H x W x D(inch)	8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5	8.7 x 12.0 x 1.5
Weight(lb)	3.3	3.3	3.3

Services				
CBAND NR		**0002 (8118082)**		
Sector		0001	0002	0003
Azimuth		30	150	270
Cell/Enodeb-Id		0640040	0640040	0640040
Antenna Model		MT6413-77A	MT6413-77A	MT6413-77A
Antenna Make		Samsung	Samsung	Samsung
Centerline		90	90	90
DLEARFCN		650006, 655324	650006, 655324	650006, 655324
Mech Down-tilt		0	0	0
Elect Down-tilt		1	1	1
Tip Height		91.2	91.2	91.2
Regulatory Power		743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP	743.34 (W/MHz) EIRP, 743.34 (W/MHz) EIRP
Cell Max Power		52.02 dBm	52.02 dBm	52.02 dBm
TMA Make				
TMA Model				
RRU Make		Samsung	Samsung	Samsung
RRU Model		MT6413-77A	MT6413-77A	MT6413-77A
Number of Tx,Rx		2 , 2	2 , 2	2 , 2
Position				
Transmitter Id		11298702	11298703	11298704
Source		VZNPP	VZNPP	VZNPP
Bandwidth		100, 60	100, 60	100, 60
Ant. Dimensions H x W x D(inch)		29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51	29.53 x 15.75 x 5.51
Weight(lb)		55.1	55.1	55.1

Callsigns Per Antenna

Sector	Make	Model	Ant CL Height AG	Ant Tip Height	Azimuth	Elect Down-tilt	Mech Down-tilt	Gain	Bandwidth	Regulator y Power	700	850	1900	2100	28 GHz	31 GHz	39 GHz	LSub-6	CBRS
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
19	Samsung	RT4423	90	90.4	30	7	0	10.34	67	3.76									CBRS_CALLSIGN
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	11.94	69.75	66.49	WQJQ689								
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	12.54	65	301.17		KNKA404							
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
0002	Samsung	MT6413-77A	90	91.2	150	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE581,WRNE582,WRNE583,WRNE584,WRNE585	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	12.54	65	301.17		KNKA404							
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	12.54	65	301.17		KNKA404							
21	Samsung	RT4423	90	90.4	270	7	0	10.34	67	3.76									CBRS_CALLSIGN
0001	Samsung	MT6413-77A	90	91.2	30	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	11.94	69.75	66.49	WQJQ689								
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	11.94	69.75	66.49	WQJQ689								
20	Samsung	RT4423	90	90.4	150	7	0	10.34	67	3.76									CBRS_CALLSIGN
0003	Samsung	MT6413-77A	90	91.2	270	1	0	23.15	105	743.34								WRNE585,WRNE586,WRNE587,WRNE58	
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.92	60.75	168.95			KNLH251,WPOJ730						
03	COMMSCOPE	NNH4-65B-R	90	93	270	2	0	13.93	63.5	84.67				WQGA906,WQGB276					
02	COMMSCOPE	NNH4-65B-R	90	93	150	2	0	13.93	63.5	84.67				WQGA906,WQGB276					
01	COMMSCOPE	NNH4-65B-R	90	93	30	2	0	13.93	63.5	84.67				WQGA906,WQGB276					

Callsigns

Callsign	Market	Radio Code	Market #	Block	State	County	License Name	Wholly Owner	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq. mil	Status	Action	Approve for Insvc
WQJQ689	Northeast	WU	REA001	C	CT	9007	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	66.49	1000	444.75	proposed	added	1
KNKA404	Hartford-New Britain-Bristol, CT	CL	CMA032	A	CT	9007	Cellco Partnership	Yes	25.000	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	824.000 - 835.000/845.000 - 846.500	869.000 - 880.000/890.000 - 891.500	301.17	400	444.75	proposed	added	1
WPOJ730	Hartford, CT	CW	BTA184	C	CT	9007	Cellco Partnership	Yes	10.000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	1895.000 1900.000/.000 - .000	1975.000 1980.000/.000 - .000	168.95	1640	444.75	proposed	added	1
KNLH251	Hartford, CT	CW	BTA184	F	CT	9007	Cellco Partnership	Yes	10.000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	1890.000 1895.000/.000 - .000	1970.000 1975.000/.000 - .000	168.95	1640	444.75	proposed	added	1
CBRS_CALL SIGN	UNLICENSE	3.5 GHz	UNLICENSE	UNLICENSE	CT	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	UNLICENSED - UNLICENSED/UNLICENSED - UNLICENSE	- / -	- / -	3.76		444.75	proposed	added	
WQGB276	Hartford-New Britain-Bristol, CT	AW	CMA032	A	CT	9007	Cellco Partnership	Yes	20.000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	1710.000 1720.000/.000 - .000	2110.000 2120.000/.000 - .000	84.67	1640	444.75	proposed	added	1
WRNE581	New York, NY	PM	PEA001	A1	CT	9007	Cellco Partnership	Yes	20.000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	3700.000 3720.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE582	New York, NY	PM	PEA001	A2	CT	9007	Cellco Partnership	Yes	20.000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	3720.000 3740.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE583	New York, NY	PM	PEA001	A3	CT	9007	Cellco Partnership	Yes	20.000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	3740.000 3760.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE584	New York, NY	PM	PEA001	A4	CT	9007	Cellco Partnership	Yes	20.000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	3760.000 3780.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE585	New York, NY	PM	PEA001	A5	CT	9007	Cellco Partnership	Yes	20.000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	3780.000 3800.000/.000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	9007	Cellco Partnership	Yes	20.000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	1720.000 1730.000/.000 - .000	2120.000 2130.000/.000 - .000	84.67	1640	444.75	proposed	added	1

WRNE586	New York, NY	PM	PEA001	B1	CT	9007	Cellco Partnership	Yes	20.000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	3800.000 3820.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE587	New York, NY	PM	PEA001	B2	CT	9007	Cellco Partnership	Yes	20.000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	3820.000 3840.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1
WRNE588	New York, NY	PM	PEA001	B3	CT	9007	Cellco Partnership	Yes	20.000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	3840.000 3860.000/ .000 - .000	.000 - .000/.000 - .000	743.34	1640	444.75	proposed	added	1

verizon

SITE NAME: PORTLAND HS CT
SITE ID: 616480547
97 HIGH STREET
PORTLAND, CT 06480

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP

N.T.S.

VICINITY MAP

N.T.S.

SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH

SITE COORDINATES: LATITUDE: 41° 50' 43.34" N
LONGITUDE: 71° 49' 41.35" W
GROUND ELEVATION: ±502' AMSL

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. INSTALL (3) PROPOSED COMMSCOPE NNH4-65B-R6 ANTENNAS
2. INSTALL (3) PROPOSED SAMSUNG MT8413-77A ANTENNAS WITH INTEGRATED RADIO
3. INSTALL (3) PROPOSED SAMSUNG RT4423 ANTENNAS WITH INTEGRATED RADIO (RF4423-48B)
4. INSTALL (3) PROPOSED SAMSUNG B2/B66A RRH ORAN (RF4439d-25A) RADIOS
5. INSTALL (3) PROPOSED SAMSUNG B5/B13 RRH ORAN (RF4461d-13A) RADIOS
6. INSTALL (1) PROPOSED RAYCAP OVP 12
7. INSTALL (3) SECTOR FRAME ANTENNA MOUNTS, TYP. (1) PER SECTOR
8. INSTALL CABLE ICE-BRIDGE
9. INSTALL NEW EQUIPMENT PAD, STEEL EQUIPMENT CANOPY AND ASSOCIATED CABINETS
10. INSTALL NEW SMART METER (PDSG)
11. INSTALL ILC CABINET
12. INSTALL TELCO CABINET
13. INSTALL UNISTRUT FRAME TO ACCOMMODATE EQUIPMENT INSTALLATION

PROJECT INFORMATION

SITE NAME:	PORTLAND HS CT
SITE ID:	616480547
SITE ADDRESS:	97 HIGH STREET PORTLAND, CT 06480
APPLICANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
CONTACT PERSON:	MICHAEL HUMPHREYS (CONSTRUCTION MANAGER) VERIZON WIRELESS (860) 560-8410
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-34'-50.63" LONGITUDE: 72°-37'-52.98" GROUND ELEVATION: 350'± A.M.S.L. COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH SOFTWARE.

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N-1	SPECIFICATIONS, NOTES, AND ANT. SCHEDULE	1
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C-2	ANTENNA CONFIGURATION PLAN, ELEVATION AND DETAIL	1
C-3	SITE AND MISCELLANEOUS DETAILS	1
C-4	TYPICAL CONDUIT PENETRATION DETAILS	1
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C-6	RF DETAILS	1
E-1	ELETRICAL CONDUIT ROUTING AND RISER DIAGRAM	1
E-2	ELECTRICAL SCHEMATIC DIAGRAM	1
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E-4	TYPICAL ELECTRICAL DETAILS	1
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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	02/20/24	TDK	TJR	CONSTRUCTION DRAWINGS - REVISED STRUCT. ANALYSIS REFERENCE
0	02/12/24	TDK	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	11/02/23	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

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Cellco Partnership d/b/a Verizon Wireless
SITE NAME: PORTLAND HS CT
SITE ID: 616480547
97 HIGH STREET
PORTLAND CT, 06480

DATE: 11/02/23
SCALE: AS NOTED
JOB NO. 22017.06

TITLE SHEET

T-1

Sheet No. 1 of 14

NOTES AND SPECIFICATIONS:

DESIGN BASIS:

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED: 101 MPH (Vasd)
  (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-16).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
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26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   A. STRUCTURAL STEEL (W SHAPES)----ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)----ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)----ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)----ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE----ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS----ASTM A325-N
   G. U-BOLTS----ASTM A36
   H. ANCHOR RODS----ASTM F 1554
   I. WELDING ELECTRODE----ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA (QTY)	SIZE (INCHES) (L x W x D)	ANTENNA © HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) CABLES (QTY)
A1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	30°	(P) SAMSUNG CBRS RRH-RT4423-48B (1), (P) OVP 12 (1)	(P) 8x12 HYBRIFLEX (2)
A2	PROPOSED	COMMSCOPE: NNH4-65B-R6	71.9 x 19.8 x 7.7	90'	30°	(P) SAMSUNG B5/B13 RRH ORAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH ORAN (RF4439d-25A) (1)	
A3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 5.5	90'	30°		
B1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	150°	(P) SAMSUNG CBRS RRH-RT4423-48B (1)	
B2	PROPOSED	COMMSCOPE: NNH4-65B-R6	71.9 x 19.8 x 7.7	90'	150°	(P) SAMSUNG B5/B13 RRH ORAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH ORAN (RF4439d-25A) (1)	
B3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 5.5	90'	150°		
C1	PROPOSED	SAMSUNG: RT4423	12.0 x 8.7 x 1.5	90'	270°	(P) SAMSUNG CBRS RRH-RT4423-48B (1)	
C2	PROPOSED	COMMSCOPE: NNH4-65B-R6	71.9 x 19.8 x 7.7	90'	270°	(P) SAMSUNG B5/B13 RRH ORAN (RF4461d-13A) (1), (P) SAMSUNG B2/B66A RRH ORAN (RF4439d-25A) (1)	
C3	PROPOSED	SAMSUNG: MT6413-77A	28.9 x 15.75 x 5.5	90'	270°		

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	02/20/24	TJR	TDK	CONSTRUCTION DRAWINGS - REVISED STRUCT. ANALYSIS REFERENCE
0	02/12/24	TJR	TDK	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	11/02/23	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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Cellco Partnership d/b/a Verizon Wireless

SITE NAME: PORTLAND H8 CT
SITE ID: 616480547
97 HIGH STREET
PORTLAND CT, 06480

DATE: 11/02/23
SCALE: AS NOTED
JOB NO. 22017.06

SPECIFICATIONS, NOTES AND ANT. SCHEDULE

N-1

Sheet No. 2 of 14

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

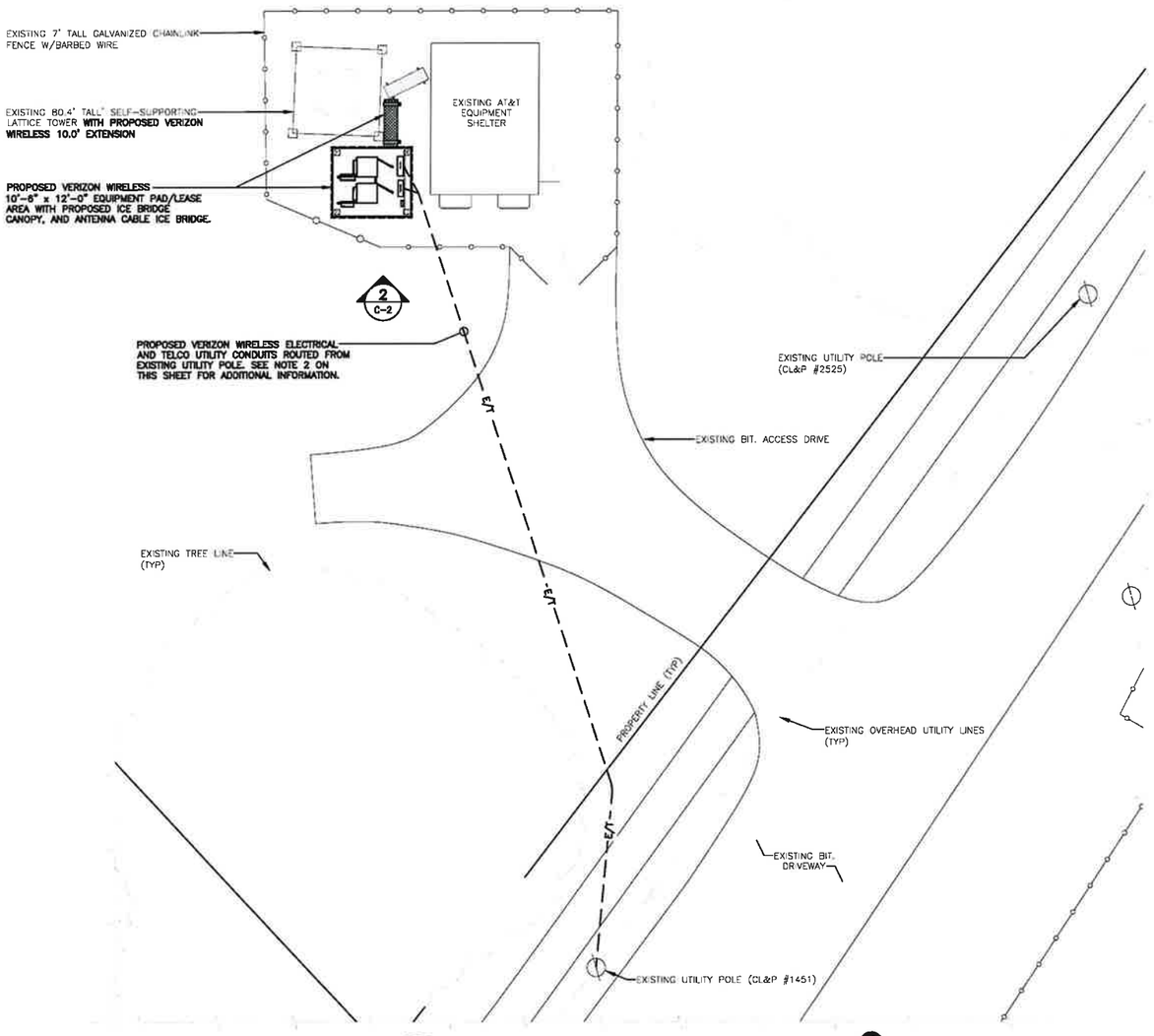
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22017.06) DATED 11/09/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

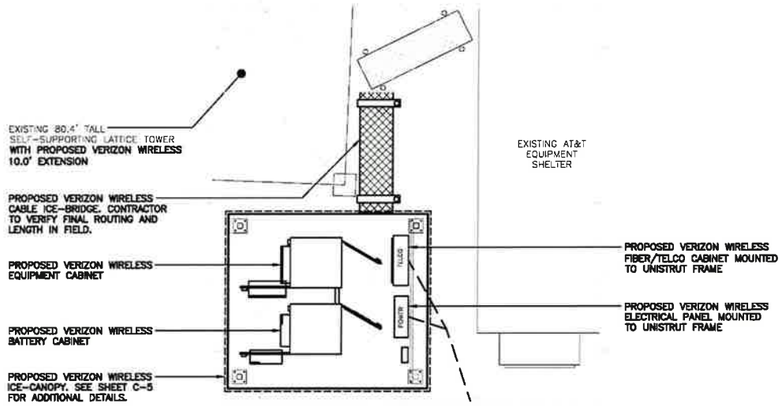
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY "STRUCTURAL COMPONENTS, LLC" (PROJECT # 240022 REV1) DATED 02/13/24 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

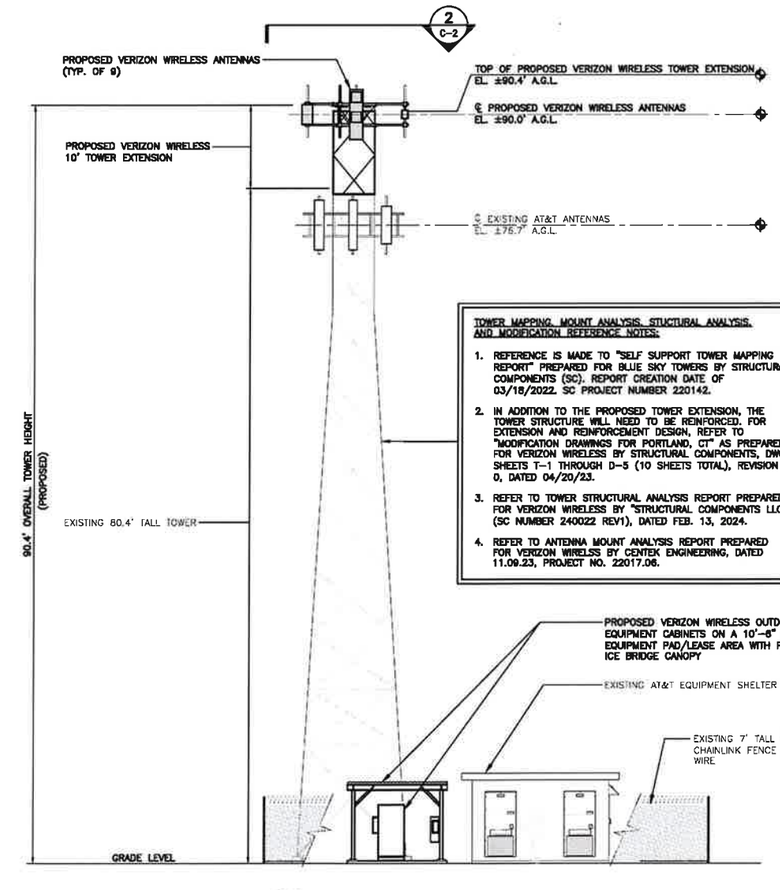
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



1 C-1 **PARTIAL SITE/COMPOUND PLAN - PROPOSED**
SCALE: 1/8" = 1'-0" APPROXIMATE NORTH



2 C-1 **EQUIPMENT PLAN - PROPOSED CONDITIONS**
SCALE: 3/16" = 1'-0" APPROXIMATE NORTH



3 C-1 **WESTERN ELEVATION**
SCALE: 1/8" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	02/20/24	TJR	TDK	CONSTRUCTION DRAWINGS -REVISED STRUCT. ANALYSIS REFERENCE
0	11/02/23	TJR	TDK	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	11/02/23	BSR	TDK	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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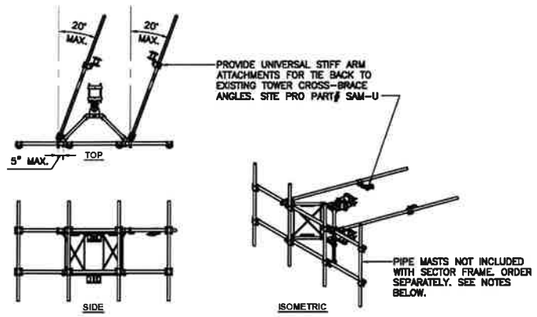
PORTLAND CT, 06480

DATE: 11/02/23
SCALE: AS NOTED
JOB NO. 22017.06

COMPOUND, EQUIPMENT PLAN & ELEVATION

C-1

Sheet No. 3 of 14

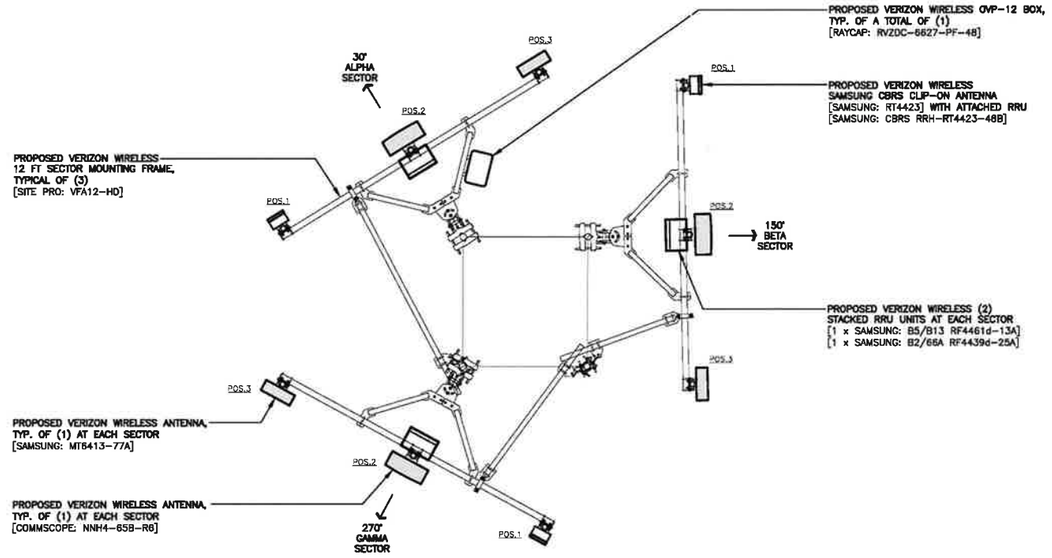


12 FT ANTENNA SECTOR MOUNTING FRAME			
EQUIPMENT	DESCRIPTION	QTY	WEIGHT
MAKE: SITE PRO MODEL: VFA12-HD	12 FT, HEAVY DUTY V-FRAME	3	735 LBS

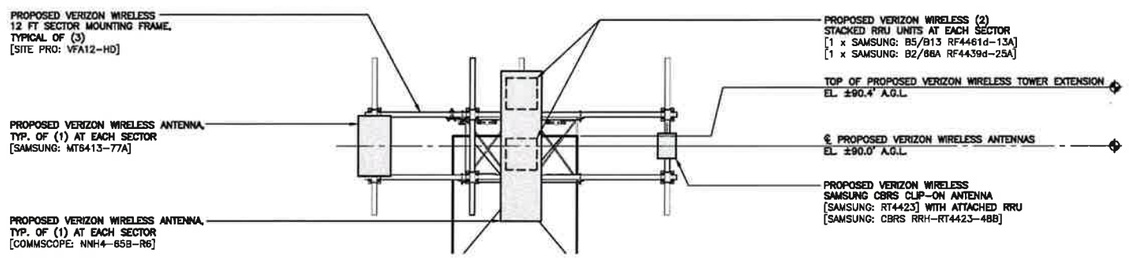
NOTES:

1. GUYED AND SST MOUNTING RANGE: 1 1/2" TO 9 1/2" ROUND LEGS AND 3" TO 6" ANGLES.
2. PIPE MASTS ARE NOT INCLUDED IN SECTOR FRAME KIT. ORDER SEPARATELY (SITE PRO PART# P30120). WEIGHT LISTED ABOVE DOES NOT INCLUDE PIPE MASTS

1 / C-2 **SECTOR FRAME MOUNT DETAIL**
SCALE: 3/16" = 1'-0"



2 / C-2 **ANTENNA MOUNTING CONFIGURATION PLAN - PROPOSED**
SCALE: 3/8" = 1'- 0"



3 / C-2 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/8" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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DATE: 11/02/23
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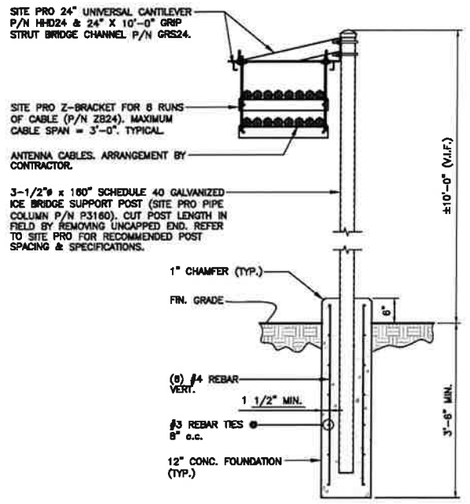
JOB NO. 22017.06

ANTENNA CONFIGURATION PLAN, ELEVATION AND DETAIL

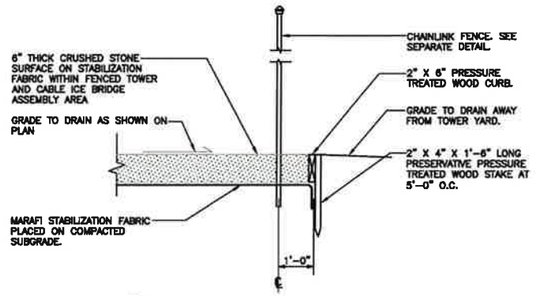
C-2

Sheet No. 4 of 14



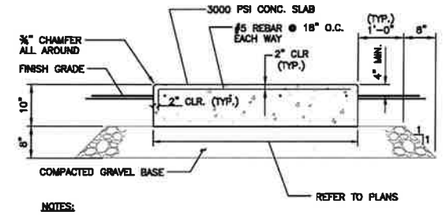
1 C-3 **ANTENNA CABLE ICE BRIDGE DETAIL**

SCALE: NOT TO SCALE



2 C-3 **COMPOUND SURFACING DETAIL**

SCALE: NOT TO SCALE



NOTES:

1. TOP OF CONC. PAD TOLERANCE IS 1/4"±.
2. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH PAD OR CAST CONDUITS IN PLACE AS APPLICABLE. COORDINATE SLEEVE/CONDUIT LOCATIONS WITH CONSTRUCTION MANAGER.
3. REFER TO NOTES ON SHEET N-1 FOR ADDITIONAL REQUIREMENTS.
4. COORDINATE EQUIPMENT CABINET AND PROPANE TANK HOLD-DOWN HARDWARE WITH RESPECTIVE MANUFACTURERS.

3 C-3 **CONCRETE PAD DETAIL (TYP)**

SCALE: NOT TO SCALE

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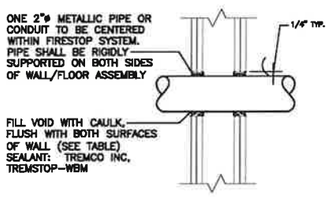
SITE AND MISCELLANEOUS DETAILS

C-3

Sheet No. 5 of 14

PIPE OR CONDUIT	ANNULAR SPACE IN.	MIN. FILL MATERIAL THICKNESS	F RATING HR
PIPE	3/4"	1 1/4"	2
CONDUIT	3/4"	3/4"	1

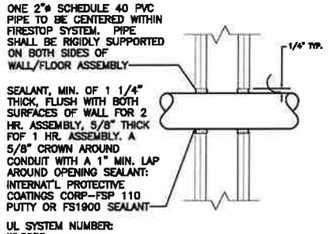


UL SYSTEM NUMBER: WL1051
F RATING – 1 & 2 HR.

1 C-4 PIPE AND CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

SCALE: NOT TO SCALE

MAX. DIA. OF THROUGH PENETRANT	NOMINAL ANNULAR SPACE IN.	FILL MATERIAL TYPE
1"	1/2"	FSP 1100 PUTTY
2"	1"	FS 1900 SEALANT



UL SYSTEM NUMBER: WL2038
F RATING – 1 & 2 HR.

2 C-4 PVC CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

SCALE: NOT TO SCALE

NOTES:

1. FLOOR OR WALL ASSEMBLY – MIN 2–1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 30–7/8 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

   A. STEEL FLOOR UNIT/FLOOR ASSEMBLY (NOT SHOWN) – AS AN ALTERNATE TO ITEM 1, THE FLOOR ASSEMBLY MAY CONSIST OF A FLUTED STEEL FLOOR UNIT/ CONCRETE FLOOR ASSEMBLY. THE FLOOR ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL FLOOR CEILING DESIGN IN THE FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   B. CONCRETE – MIN 2–1/2 IN. THICK REINFORCED LIGHTWEIGHT ON NORMAL WEIGHT (100–150 PCF) CONCRETE, AS MEASURED FROM THE TOP PLANE OF THE FLOOR UNITS.

   C. STEEL FLOOR AND FORM UNITS* – COMPOSITE OR NON–COMPOSITE 1–1/2 TO 3 IN. DEEP FLUTED GALV STEEL UNITS AS SPECIFIED IN THE INDIVIDUAL FLOOR–CEILING DESIGN. MAX DIAM OF OPENING IS 30–7/8 IN.

2. THROUGH–PENETRANT – ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. TO MAX 7/8 IN. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   A. STEEL PIPE NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

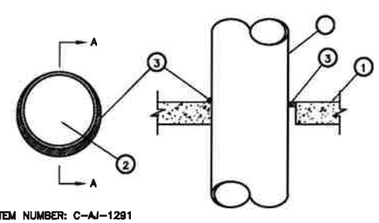
   C. COPPER PIPE NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   D. COPPER TUBING NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. CONDUIT NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.

   F. CONDUIT NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).

3. FILL, VOID OR CAVITY MATERIAL* – SEALANT – MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE AND CONCRETE, A MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.



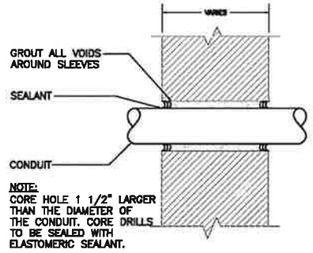
UL SYSTEM NUMBER: C–AJ–1291
F RATING – 2–HR

SECTION A–A

3 C-4 METAL PIPE THROUGH CONCRETE FLOOR/ WALL OR BLOCK WALL

SCALE: NOT TO SCALE

FLOOR OR WALL	MIN. THICK.	MAX. PIPE DIA.	MIN. ANNULAR SPACE	MAX. ANNULAR SPACE	MIN. FIL. MAT. THICK.	MIN. FORM. MAT. THICK.	F RATING
F	3 3/4"	1 1/2"	3/8"	2 1/8"	1"	2 3/4"	2
F	3 3/4"	6"	3/8"	3/4"	1"	2 3/4"	2
F	3 3/4"	6"	3/8"	1"	2"	1 3/4"	2
F	4 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	1"	2"	2 1/2"	3
W	5 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
W	5 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
W	6 1/2"	1 1/2"	3/8"	2 1/8"	2"	2 1/2"	3
W	6 1/2"	6"	3/8"	1"	2"	2 1/2"	3



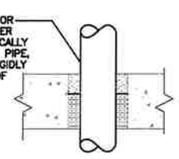
4 C-4 PIPE AND CONDUIT PENETRATION DETAIL IN NON-RATED PARTITION

SCALE: NOT TO SCALE

THROUGH PENETRANTS

ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL.

FORMING MATERIAL SHALL BE A MIN. OF 1 1/2" THICK OF MIN. 4.0 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED IN OPENING, USG INTERIORS–TYPE SAF



THICKNESS OF SEALANT APPLIED FLUSH W/THE TOP SURFACE OF BOTH SIDES OF FLOOR/WALL (SEE TABLE), USG INTERIORS–TYPE SS

UL SYSTEM NUMBER: CAJ1020

F RATING – 3 HR.

5 C-4 PIPE AND CONDUIT PENETRATION DETAIL IN CONCRETE OR MASONRY

SCALE: NOT TO SCALE

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TYPICAL CONDUIT PENETRATION DETAILS

C-4

Sheet No. 5 of 14

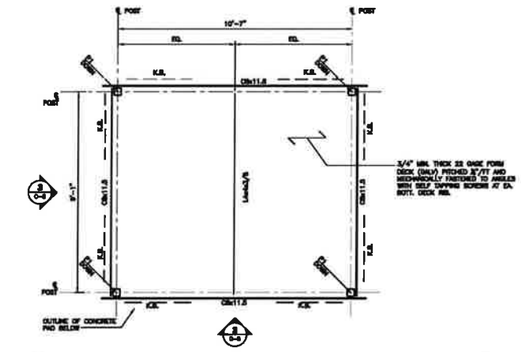
PLAN NOTES AND LEGEND

1. VERIFY ALL DIMENSIONS, ELEVATIONS, EXISTING FRAMING MEMBER SIZES AND GENERAL CONDITIONS PRIOR TO COMMENCEMENT OF WORK. NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCIES BETWEEN THESE DRAWINGS AND EXISTING CONDITIONS.

INDICATES HSS4x4x1/4 ASTM A500 GR. B (F_y = 46ksi) STEEL POST.

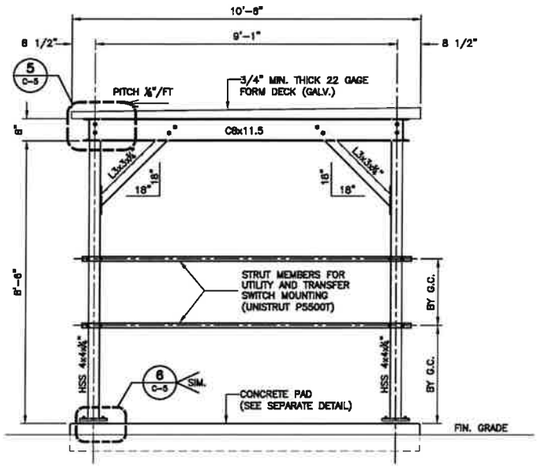
INDICATES SPAN DIRECTION.

K.B. INDICATES L3x3x1/4 ASTM A36 (Fy=36 KSI) STEEL ANGLE

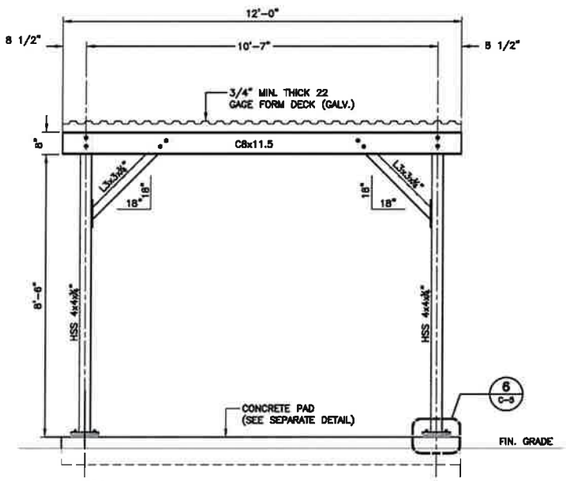


1 / C-5 **ICE BRIDGE CANOPY - ROOF FRAMING PLAN**
SCALE: 1/4" = 1'-0"

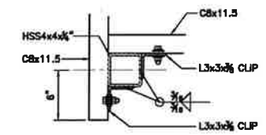
APPROXIMATE NORTH



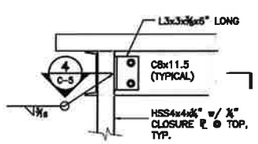
3 / C-5 **ICE BRIDGE CANOPY ELEVATION**
1/2" = 1'-0"



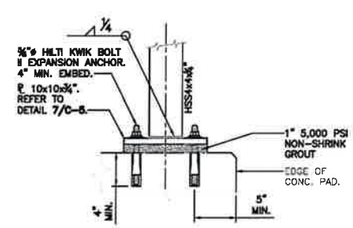
2 / C-5 **ICE BRIDGE CANOPY ELEVATION**
SCALE: 1/2" = 1'-0"



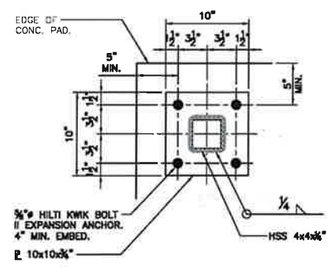
4 / C-5 **CANOPY FRAME CONNECTION**
SCALE: 1-1/2" = 1'-0"



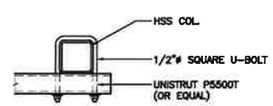
5 / C-5 **CANOPY FRAME CONNECTION**
SCALE: 1-1/2" = 1'-0"



6 / C-5 **CANOPY POST CONNECTION**
SCALE: 1-1/2" = 1'-0"



7 / C-5 **CANOPY POST BASE PLATE**
SCALE: 1-1/2" = 1'-0"



8 / C-5 **STRUT TO COL. CONN. DETAIL (TYP)**
SCALE: 1-1/2" = 1'-0"

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EQUIPMENT ICE BRIDGE CANOPY PLAN AND DETAILS

C-5

Sheet No. 7 of 14

MT6413-77A

ANTENNA		
EQUIPMENT	DIMENSIONS	
MAKE: SAMSUNG MODEL: MT6413-77A	28.90"H x 15.75"W x 5.51"D	

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. ANTENNA HAS ITS OWN BUILT-IN RRU.

1 C-6 PROPOSED ANTENNA DETAIL
SCALE: NOT TO SCALE

RRH ONLY — ALL-IN-ONE ANTENNA & RRH

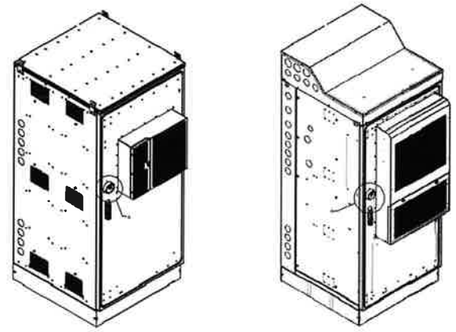
CBRS CLIP-ON ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RT4423	12"H x 8.7"W x 1.5"D	3.3 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RT4423-48(A/B)	11.8"H x 8.7"W x 4.2"D	15.43 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. RT4423-48A IS FOR DC
   RT4423-48B IS FOR AC (AC AND DC TYPE HAVE SAME SIZE AND WEIGHT)
3. DIMENSIONS AND WEIGHT SHOWN ARE FOR THE RRU ONLY.

2 C-6 COMBINED RRH/CLIP-ON ANTENNA DETAIL
NOT TO SCALE



CMC74-36B (BATTERY) — CMC74-36E (EQUIPMENT)

SIDE-BY-SIDE ANTENNA MOUNTING KIT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: CMC74-36E	80"H x 36"W x 43"D	455 LBS.
MAKE: COMMSCOPE MODEL: CMC74-36B	80"H x 36"W x 43"D	846 LBS.

NOTES:
1. CONTRACTOR TO CONFIRM CABINET MAKE/MODEL AND QUANTITY WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

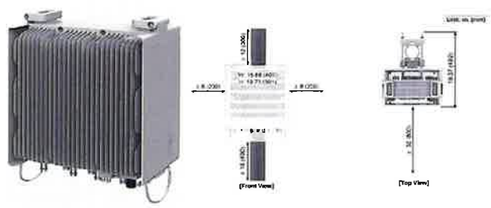
3 C-6 PROPOSED EQUIPMENT CABINET DETAIL
SCALE: NOT TO SCALE

ELEVATION - FRONT

BOTTOM

12-PORT SECTOR ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: NNH4-65B-R8	72"L x 19.6"W x 7.7"D	83.1 LBS. (W/OUT MOUNT KIT)

4 C-6 SECTOR ANTENNA DETAIL
NOT TO SCALE

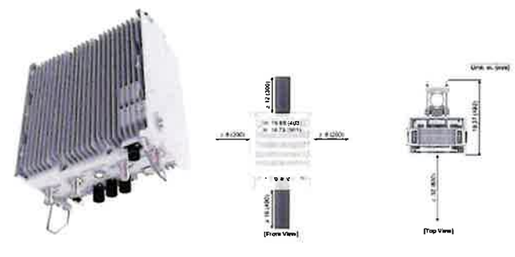


RRH - ISOMETRIC — RRH CLEARANCES

DUAL BAND RRU (REMOTE RADIO UNIT)			
EQUIPMENT	BANDS	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4439d-25A	B2: PCS (1900 MHz) B66: AWS (2100 MHz)	15.0"H x 15.0"W x 10.0"D	74.7 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-6 DUAL-BAND AWS/PCS MACRO RADIO UNIT DETAIL
SCALE: NOT TO SCALE



RRH - ISOMETRIC — RRH CLEARANCES

REMOTE RADIO UNIT (RRU)		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SAMSUNG MODEL: RF4418d-13A	14.96"H x 14.96"W x 10.23"D	79.1 LBS.

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE AND CONFIRM FINAL EQUIPMENT MAKE/MODEL AND QUANTITY SELECTION WITH VERIZON WIRELESS CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-6 DUAL-BAND 700/850 MHZ MACRO RADIO UNIT DETAIL
SCALE: NOT TO SCALE

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RF DETAILS

C-6

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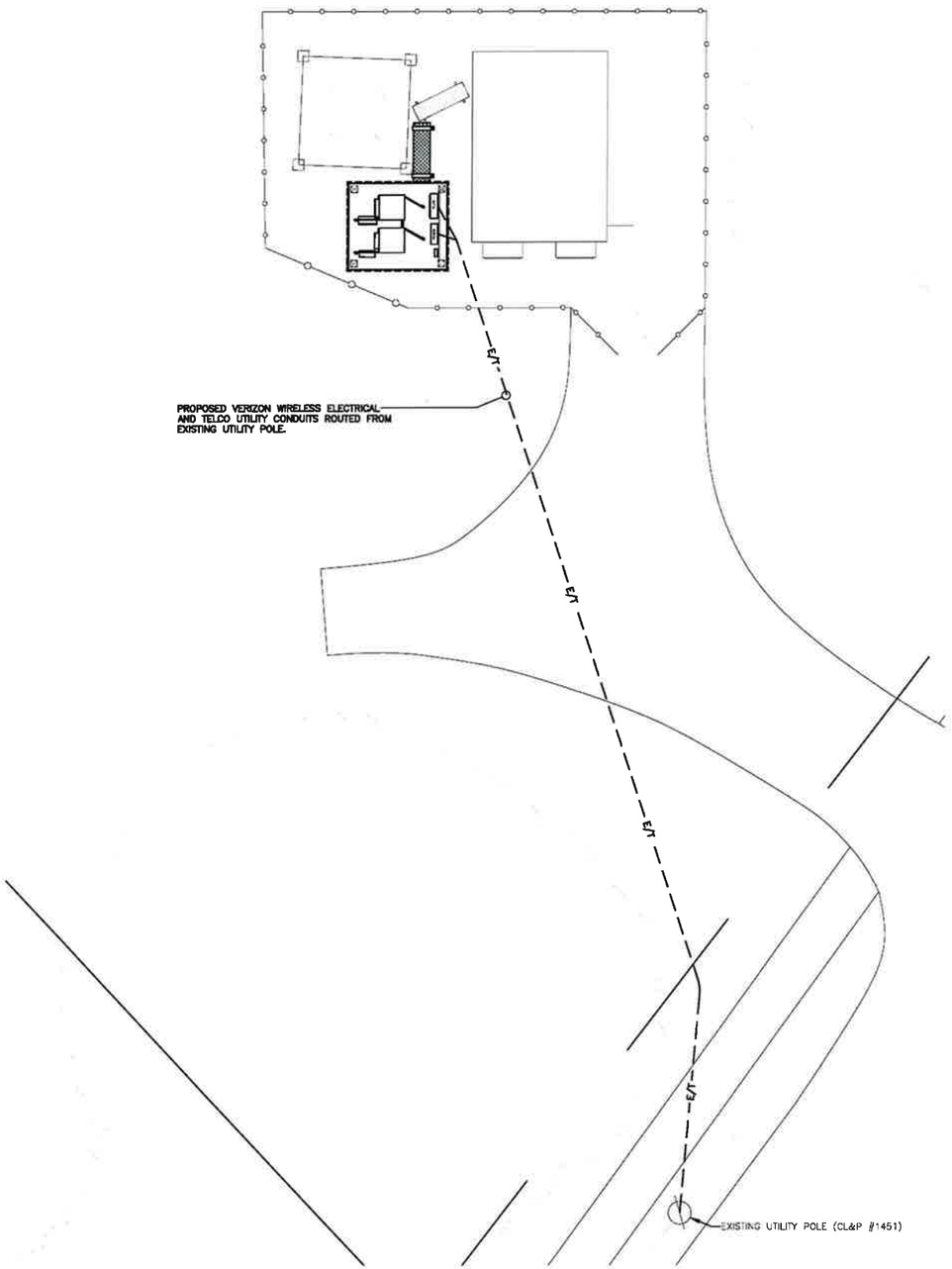
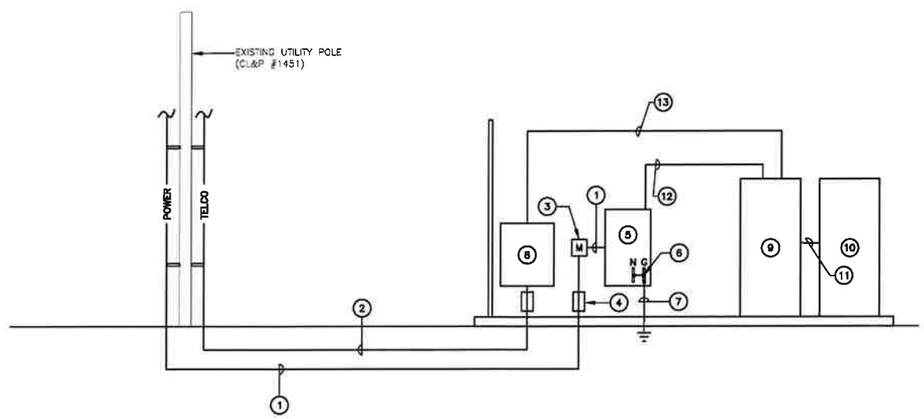


1 E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1/8" = 1'-0"

RISER NOTES

1. (3) #3/0 AWG, 3"C.
2. NEW 4" TELCO CONDUIT ROUTED FROM EXISTING UTILITY POLE TO NEW EQUIPMENT LOCATION. CONTRACTOR TO VERIFY FINAL ROUTING IN FIELD.
3. 200A, 240V, 1Ø UTILITY COMPANY APPROVED METER SOCKET.
4. EXPANSION COUPLING (TYPICAL).
5. NEW 200A, 240V, 1Ø, ILC CABINET
6. #4 AWG MAIN BONDING JUMPER.
7. #4 AWG GROUNDING ELECTRODE BONDED TO EQUIPMENT GROUND RING. REFER TO GROUNDING SCHEMATIC ON DWG. E-2.
8. 3' X 3' X 1' HOFFMAN BOX.
9. VERIZON WIRELESS EQUIPMENT CABINET
10. VERIZON WIRELESS BATTERY CABINET
11. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
12. POWER CONDUIT AND CONDUCTORS FOR CABINETS. COORDINATE WITH MANUFACTURER AND CONSTRUCTION MANAGER.
13. CONDUITS AND CONDUCTORS FOR TELCO CONNECTION TO EQUIPMENT CABINETS AS REQUIRED BY MANUFACTURER AND CONSTRUCTION MANAGER FOR PROFESSIONAL OPERATION OF EQUIPMENT.



2 E-1 **ELECTRICAL RISER DIAGRAM**
SCALE: NOT TO SCALE

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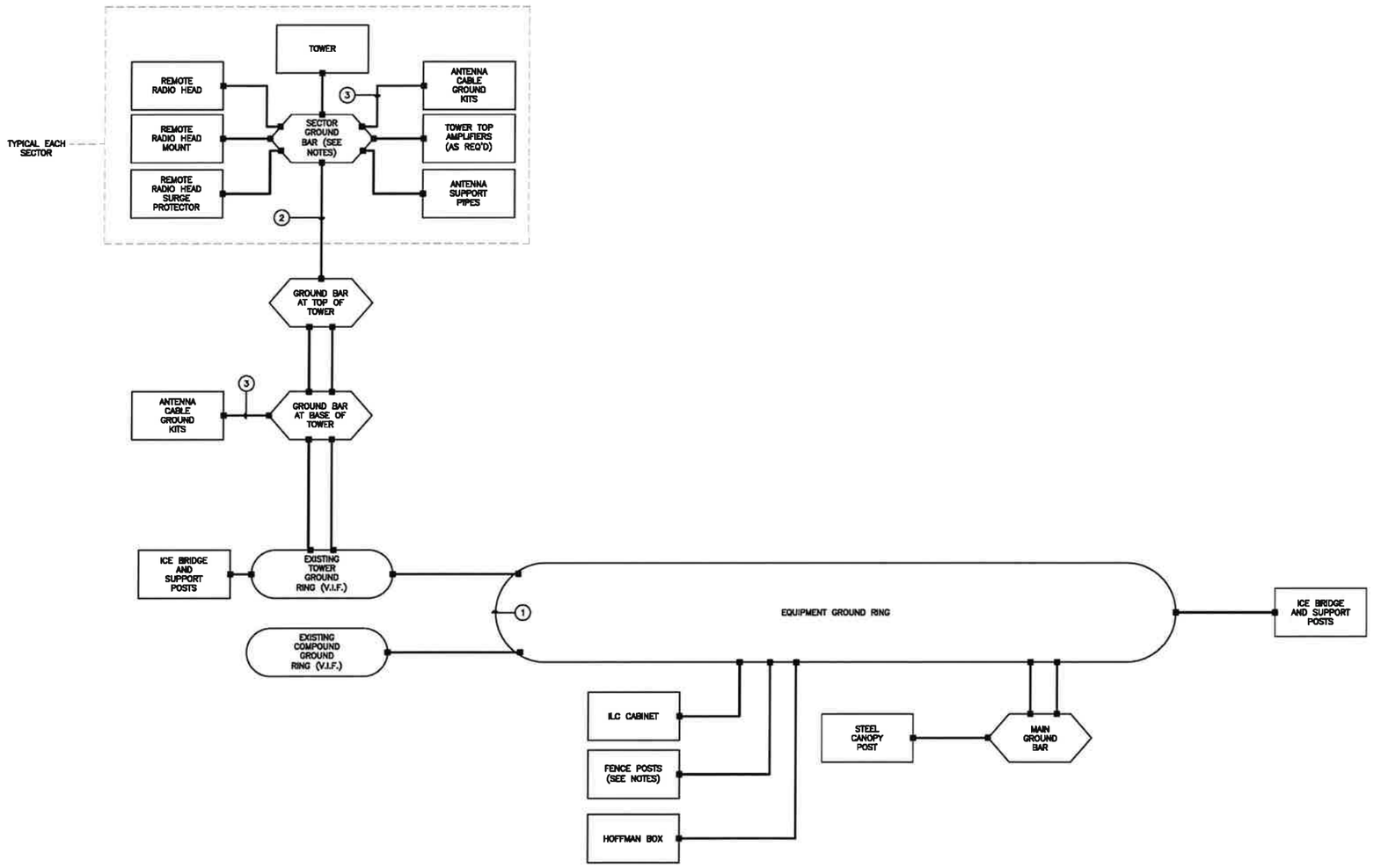
ELETRICAL CONDUIT ROUTING AND RISER DIAGRAM

E-1

Sheet No. 9 of 14



1 E-2 **ELECTRICAL SCHEMATIC DIAGRAM**
SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) GROUND RING, #2 AWG BCW
(2) #2/0 GREEN INSULATED
(3) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
12. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
13. BOND GENERATOR TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
14. BOND PROPANE TANK TO GROUND RING PER NEC AND MANUFACTURERS SPECIFICATIONS. COORDINATE WITH TANK MANUFACTURER FOR REQUIREMENTS PRIOR TO INSTALLATION.
15. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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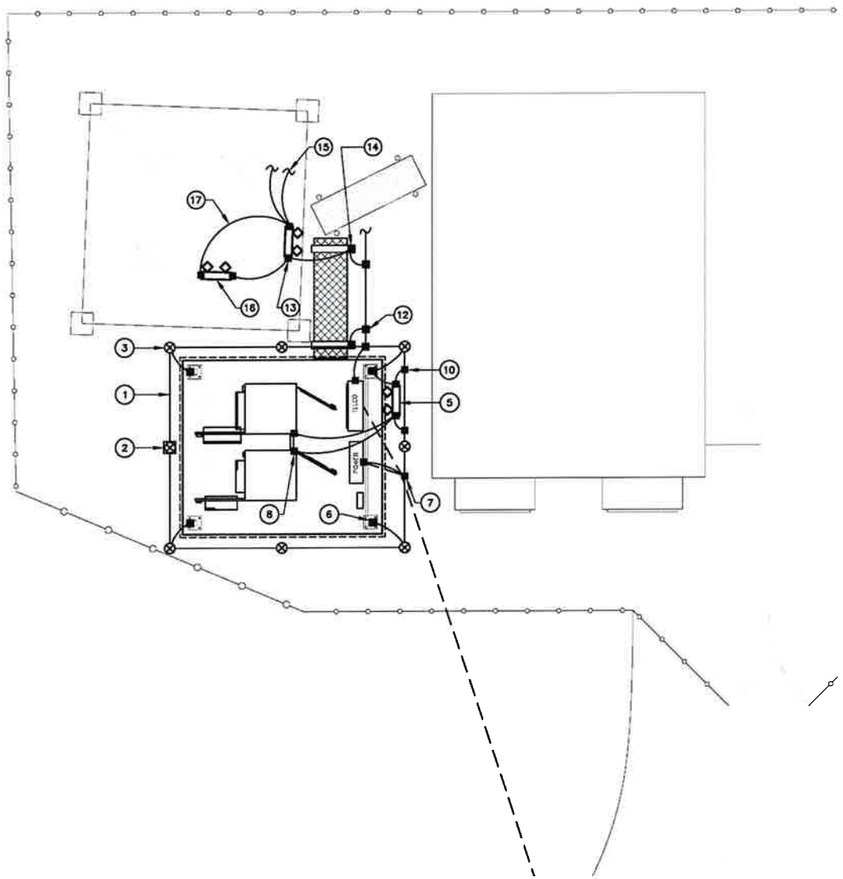
ELECTRICAL SCHEMATIC DIAGRAM

E-2

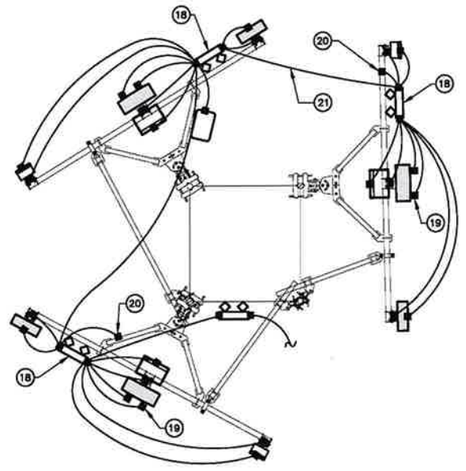
Sheet No. 10 of 14

GROUNDING PLAN NOTES:

1. #2 SOLID TINNED BCW GROUND RING (INSTALL AS SHOWN ALONG COMPOUND PERIMETER, AND COMPLETELY ENCIRCLING THE EQUIPMENT PAD).
2. GROUNDING ROD WITH ACCESS (TYP.) SEE DETAILS.
3. GROUNDING ROD (TYP.) SEE DETAILS.
4. CONNECT FENCE TO COMPOUND GROUNDING RING.
5. MAIN GROUND BAR TYP.
6. BOND CANOPY POST TO GROUND RING TYP. EACH CORNER.
7. BOND CABINETS TO GROUND RING PER NEC AND MANUFACTUTER REQUIREMENTS.
8. BOND EQUIPMENT CABINETS TO GROUND BAR PER NEC AND MANUFACTURER REQUIREMNENTS.
9. NOT USED.
10. BOND GROUND BAR TO GROUND RING TYP. 2 PLACES.
11. NOT USED.
12. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING SEE DETAILS.
13. LOWER TOWER MOUNTED GROUND BAR.
14. BOND GROUND BAR TO ICE-BRIDGE
15. BOND GROUND BAR TO TOWER GROUND RING TYP.
16. UPPER TOWER MOUNTED GROUND BAR.
17. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR. TYP. 2 PLACES
18. SECTOR GROUND BAR TYP.
19. BOND ANTENNA MOUNTING PIPES TO SECTOR GROUND BAR.
20. BOND SECTOR GROUND BAR TO ANTENNA FRAME STEEL TYP.
21. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.



1 / E-3 COMPOUND GROUNDING PLAN
SCALE: NOT TO SCALE



2 / E-3 ANTENNA GROUNDING PLAN
SCALE: NOT TO SCALE

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ELECTRICAL GROUNDING PLANS

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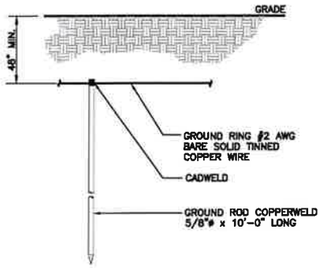
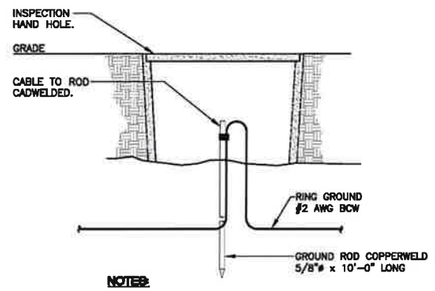


NOTES:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

1 / E-4 **GROUND ROD DETAIL**
SCALE: NOT TO SCALE

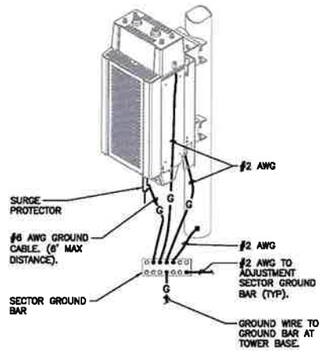


NOTES:

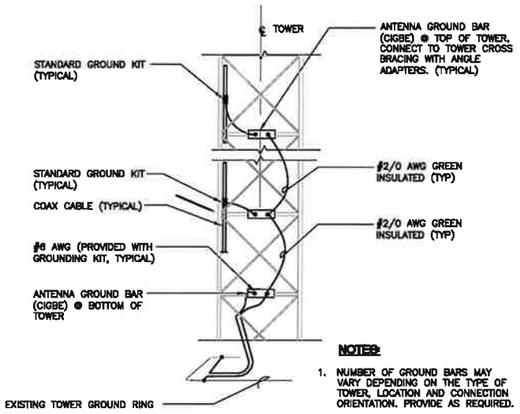
1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

2 / E-4 **GROUND ROD WITH ACCESS DETAIL**
SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



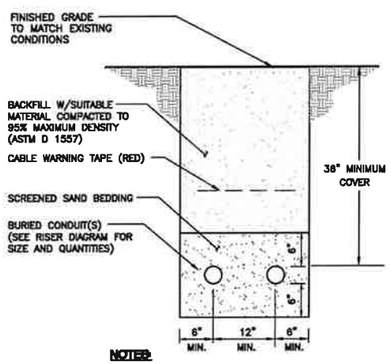
3 / E-4 **RRH POLE MOUNT GROUNDING**
SCALE: NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

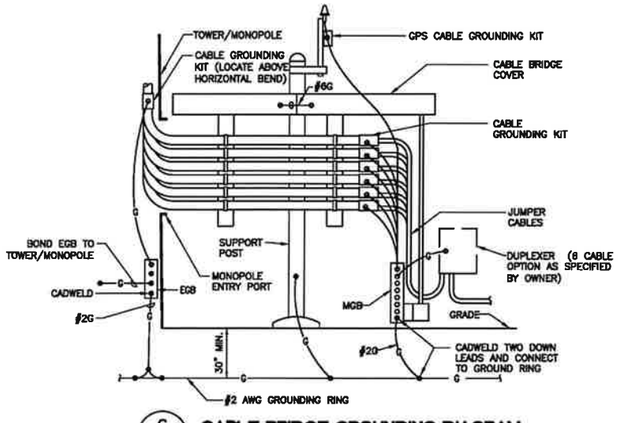
4 / E-4 **ANTENNA CABLE GROUNDING - LATTICE TOWER**
SCALE: NOT TO SCALE



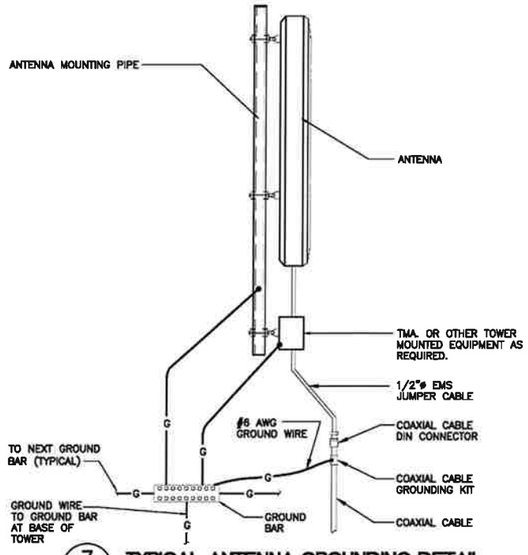
NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN UTILITY SOURCE AND SERVICE EQUIPMENT, COORDINATE WITH UTILITY COMPANY FOR BURIAL DEPTH REQUIREMENTS.
4. COORDINATE WITH ELECTRICAL ENGINEER WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN SERVICE EQUIPMENT AND EQUIPMENT SHELTER.

5 / E-4 **TYPICAL ELECTRICAL TRENCH DETAIL**
SCALE: NOT TO SCALE



6 / E-4 **CABLE BRIDGE GROUNDING DIAGRAM**
SCALE: NOT TO SCALE



7 / E-4 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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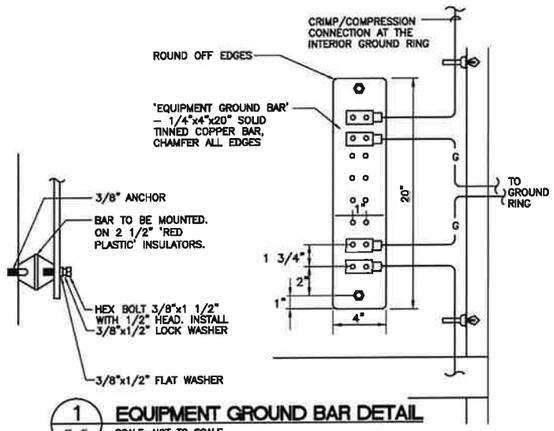
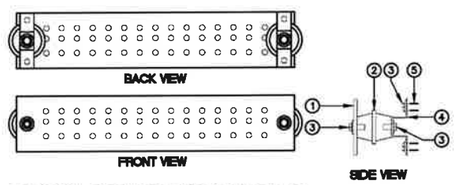
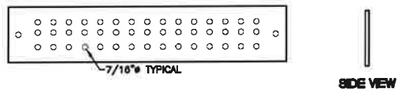


1 E-5 **EQUIPMENT GROUND BAR DETAIL**
SCALE: NOT TO SCALE



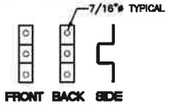
TYPICAL GROUND BAR ASSEMBLY
N.T.S.



TYPICAL GROUND BAR - DIMENSIONS
N.T.S.

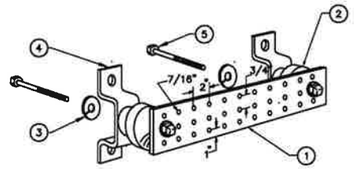
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.



BRACKET FOR GROUND BAR-DIMENSIONS
N.T.S.

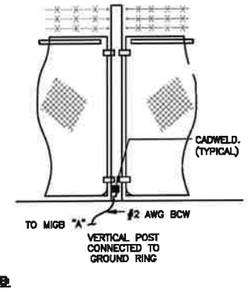
2 E-5 **MASTER/EQUIPMENT GROUND BAR DETAILS**
SCALE: NOT TO SCALE



NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-8058.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

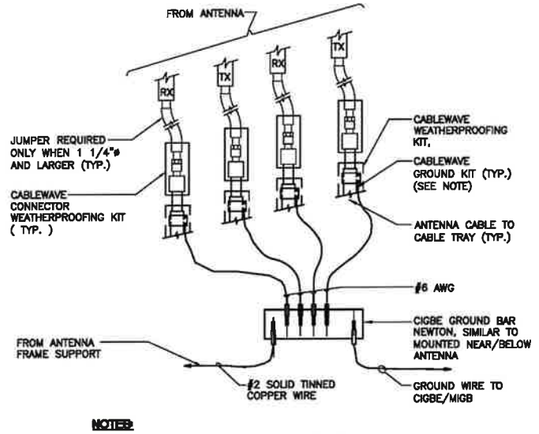
3 E-5 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. VERTICAL POSTS SHALL BE BONDED TO THE RING AT EACH CORNER AND AT EACH GATE POST. AS A MINIMUM ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 FOOT STRAIGHT RUN OF FENCE.
2. HORIZONTAL POLES SHALL BE BONDED TO EACH OTHER.
3. BOND EACH HORIZONTAL POLE / BRACE TO EACH OTHER AND TO EACH VERTICAL POST THAT IS BONDED TO THE EXTERIOR GROUND RING.

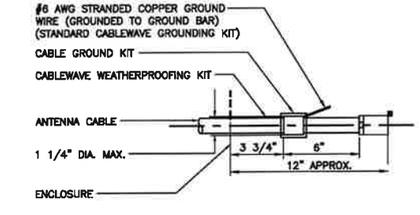
4 E-5 **GROUND-STD. DETAIL FENCE GROUNDING**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

5 E-5 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

6 E-5 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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Sheet No. 13 of 14

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL 200A, 208V, 3P, 4 WIRE ELECTRIC SERVICE WITH SMART SUB-METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT.
2. NEW SITE TELEPHONE SERVICE AS SPECIFIED BY TELEPHONE COMPANY.
3. GENERATOR
4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, ETC. AS INDICATED OR NOTED ON PLANS.
5. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, GROUND BARS, ETC.
6. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
7. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. TELEPHONE CABLES.

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

N. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE - P&S #2096 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16620
(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
-	02/20/24	TDK	TJR	CONSTRUCTION DRAWINGS - REVISED STRUCT. ANALYSIS REFERENCE
1	02/12/24	TDK	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	11/09/23	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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DATE: 11/02/23
SCALE: AS NOTED
JOB NO. 22017.08

ELECTRICAL SPECIFICATIONS

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