STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

VIA ELECTRONIC MAIL

April 26, 2019

Julia Coughlin
Site Acquisition Specialist
Empire Telecom USA, LLC
16 Esquire Road
Billerica, MA 01862

RE: **EM-AT&T-148-190301** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 23 Wayne Road, Wallingford, Connecticut.

Dear Ms. Coughlin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of April 23, 2019 submitted in response to the Council's March 7, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/laF

c: The Honorable William W. Dickinson, Jr., First Selectman, Town of Wallingford
Kacie Hand, Town Planner, Town of Wallingford

Fontaine, Lisa

From: Julia Coughlin <jcoughlin@empiretelecomm.com>
Sent: Tuesday, April 23, 2019 10:12 AM
To: Robidoux, Evan; CSC-DL Siting Council
Cc: Kristen White; Lauren Groppi
Subject: re: EM-AT&T-148-190301 - AT&T @ 23 Wayne Road, Wallingford, CT 06492 (CT2168)
Attachments: EM-AT&T-148-190301 - Revised Documents - 23 Wayne Rd. Wallingford CT2168.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: satisfied

Good morning,

Thank you again for the extension for this project while we produced the requested supplementary documents for the application EM-AT&T-148-190301 - AT&T @ 23 Wayne Road, Wallingford, CT 06492 requested in the Council's letter dated March 7, 2019.

A copy of these electronic documents and the attached letter has been dispatched via UPS to arrive on Thursday, April 25, 2019.

Thank you kindly,

Julia Coughlin
Site Acquisition Specialist

EMPIRE
telecom
16 Esquire Road | Billerica, MA 01862
Mobile: 978-284-3376
Email: jcoughlin@empiretelecomm.com
Website: www.EmpireTelecomm.com

From: Kristen White
Sent: Friday, April 5, 2019 6:04 PM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Julia Coughlin <jcoughlin@empiretelecomm.com>
Subject: Request for Extension of Time - EM-AT&T-148-190301 - AT&T @ 23 Wayne Road, Wallingford, CT 06492 (CT2168)

Good day,

Please see the attached request for Extension of time to produce requested supplementary documents for the application EM-AT&T-148-190301 - AT&T @ 23 Wayne Road, Wallingford, CT 06492 requested in the Council's letter dated March 7, 2019. Additional time is needed to produce and assemble the requested documents.

Would the Council please grant an extension of time to provide these updated documents? A 30-day extension should be adequate, if permitted.

A copy of this electronic request and the attached letter has been dispatched via UPS to arrive on Monday, April 8, 2019.

Thank you for your time, review, and consideration,

Kristen White
Site Acquisition Supervisor

EMPIRE
telecom
16 Esquire Road | Billerica, MA 01862
Mobile: 978-284-3801
Email: kwhite@empiretelecomm.com
Website: www.EmpireTelecomm.com

April 23, 2019

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051 Also delivered via email to Evan.Robidoux@ct.gov & Siting.Council@ct.gov

Regarding:	EM-AT&T-148-190301 - Notice of Exempt Modification – Equipment Modification, Mount Replacement, and Tower Reinforcement
Property Address:	23 Wayne Road, Wallingford, CT 06492 (the "Property")
Applicant:	AT&T Mobility ("AT&T", Site # CT2168)

Dear Ms. Bachman:

I am in receipt of the Council's letter dated March 7, 2019, requesting additional and revised documentation to supplement AT&T's request for an acknowledgement of Exempt Modifications for the proposed work at the above-referenced address. Thank you for providing us with additional time to produce and assemble the requested documents in your letter dated April 10, 2019.

Attached herewith are the three documents requested to supplement AT&T's request for an acknowledgement of Exempt Modifications:

1) A Passing Mount Utilization equal to or below 100%;
   a. Please see attached **Mount Replacement Analysis** dated April 18, 2019, by Maser Consulting Connecticut.

2) An updated Structural Analysist Report that references the current 2018 Connecticut State Building Code and any mount modifications; and
   a. Please see attached **Structural Analysis** dated November 16, 2018 (Revised), by Maser Consulting Connecticut (updated references to the 2018 Connecticut State Building Code on page 2, and reference to mount modifications on page 4, pertinent part copied below from "Site Specific Design Parameters and Assumptions" Section):
   - The existing antenna mounts shall be removed and replaced with larger sector frames.

3) An updated set of Construction Drawings that reference the current 2018 Connecticut State Building Code and any mount modifications.
   a. Please see attached **Construction Drawings** dated March 13, 2019, by Maser Consulting Connecticut (see page 1 for updated reference to the 2018 Connecticut State Building Code and mount modifications on pages 4-6).

Following your review if these documents, please advise if anything further is needed for the Council to complete its review and assessment of this request.

Thank you for your time, review, and consideration.

Sincerely,

Julia Coughlin

Julia Coughlin
Site Acquisition Specialist
Empire Telecom USA, LLC
jcoughlin@empiretelecomm.com

Enclosures: Mount Replacement Analysis dated April 18, 2019, by Maser Consulting Connecticut

Structural Analysis dated November 16, 2018 (Revised), by Maser Consulting Connecticut

Construction Drawings dated March 13, 2019, by Maser Consulting Connecticut

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Mount Replacement Analysis

FOR

CT2168 – MT. Tom Wallingford

FA #: 10035084
23 Wayne Road
Wallingford, CT 06492
New Haven County
41.462742, -72.841881

LTE 5G NR Upgrade – MRCTB032262
LTE 6C – MRCTB032233
LTE 7C – MRCTB032242

Mount Utilization: 62.0%

April 18, 2019

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T 732.383.1950

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
REGISTERED PROFESSIONAL ENGINEER

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32577

MC Project No. 18963007A

Objective:

The objective of this report is to determine the capacity of the existing antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

Document Type	Remarks	Source
Mount Mapping	*TEP Project #:146598.192991, dated 11/2/18*	*Maser Consulting Connecticut*
Radio Frequency Data Sheet (RFDS)	*RFDS ID: 2346933, version 2.0, dated 6/14/18*	*Empire*
Previous Mount Analysis	*Maser Consulting Project #: 18963007A Rev. 1, dated 4/17/19*	*Maser Consulting Connecticut*
Construction Drawings	*Maser Consulting Project #: 18963007A Rev. 6, dated 3/13/19*	*Maser Consulting Connecticut*
Sector Mount	*Sabre Industries Drawing #: C10857001C*	*Sabre Industries*

Codes, Standards and Loading:

Jurisdictional adopted codes and standards:

- 2018 Connecticut State Building Code, Incorporating the 2015 International Building Code

Maser Consulting Connecticut utilized the following codes and standards:

- Structural Standards for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures ANSI/TIA-222-H
    - Ultimate Wind Speed – 119 mph (3-Second Gust)
    - Exposure Category – C
    - Risk Category – II
    - Topographic Factor, K_{zt} – 1.0
    - Mean Base Elevation (AMSL) – 391.57’
    - Ice Wind Speed – 50 mph (3-Second Gust)
    - Design Ice Thickness – 1.0”
    - Maintenance Wind Speed – 30 mph
        - Maintenance Live Load – 250 lbs. at the worst-case location on the mount
        - Maintenance Live Load – 500 lbs. at the worst-case antenna location

The following equipment has been considered for the analysis of the antenna mount(s):

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Mount Information
3	**KATHREIN**	**80010965**	**Proposed**	Proposed Sector Mount
3	**ERICSSON**	**RRUS 4478 B5**		
3	**ERICSSON**	**RRUS 4426 B66**		
3	**ERICSSON**	**RRUS 4478 B14**		
6	**KAELUS**	**DBCT108F1V92-1**		
1	**RAYCAP**	**DC6-48-60-18-8C-EV**		
3	POWERWAVE	7770	Existing	
3	CCI	OPA-65R-LCUU-H6		
3	QUINTEL	QS66512-2		
3	POWERWAVE	TT19-08BP111-001		
3	ERICSSON	RRUS 11		
3	ERICSSON	RRUS 32		
3	ERICSSON	RRUS-32 – B2		
2	RAYCAP	DC6-48-60-18-8F		Tower Mounted*
3	ERICSSON	RRUS-E2 B29		Ground Mounted*

***Ground mounted and tower mounted equipment was not considered in this analysis.**

Analysis Approach:

The antenna mount has been modeled in RAM Elements (V15 15.00.00.18), a comprehensive structural analysis program. The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes and standards. The program performs an analysis based on the applicable steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

The scope of this assessment does not include analysis of the supporting tower structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent engineer.

Assumptions:

General Site Design Assumptions:

1. All engineering services are performed on the basis that the information provided to Maser Consulting Connecticut and used in this analysis is current and correct.
2. The mounting frames were properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.
3. The connection from the tower to the mount is in good condition and has been analyzed and found sufficient assuming it will achieve its theoretical strength.
4. Due to site specific analysis parameters, it is assumed that wind forces will control over seismic forces and as such, seismic forces have not been considered in this analysis.
5. It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
6. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
7. The existing equipment loading has been applied at locations determined from the supplied documentation and field observations. Should the existing equipment configuration differ from what is utilized in this analysis, the results of this analysis are invalid.
8. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.

Site Specific Assumptions and Design Parameters:

1. All proposed equipment locations are to be as depicted in the rendered diagram in Appendix A of this report. Any changes made to the proposed equipment locations will render this report invalid.

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Maser Consulting Connecticut

Calculations:

Selected calculations and analysis output can be found in Appendix A of this report.

Analysis Results and Conclusion:

Component	Utilization %	Pass/Fail
Face Horizontal	*34.0*	*Pass*
Mount Pipe	*36.0*	*Pass*
Standoff Bracing	*18.0*	*Pass*
Standoff Horizontal	*26.0*	*Pass*
Standoff Plates	*62.0*	*Pass*
Tie-Back	*9.0*	*Pass*
Mount-to-Tower, Bolts	*9.1*	*Pass*

Structure Rating – *(Controlling Utilization of all Components)*	**62.0%**

Recommendation:

The propsed mounting frames are **SUFFICIENT** for the final loading configuration and do not require modifications.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the structural members supporting the AT&T telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure. The mount was checked up to, and including, the bolts that fasten it to the attachment. However, no structural qualifications are made or implied by this document for the attachment.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.
Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Jeremy Hesson
Senior Engineer

Disclaimer of Warranties:

The engineering services rendered by Maser Consulting Connecticut in connection with this structural analysis are limited to a computer analysis of the mounting frame structure and theoretical capacity of its main structural members. No allowance has been made for any damaged, bent, missing, loose, or rusted members or connections.

Maser Consulting Connecticut will accept no liability which may arise due to any deficiency in design, material, fabrication, erection, construction, or lack of maintenance. Maser Consulting Connecticut has not performed a site visit of the mounting frame to verify member sizes or equipment loading. Contractor should inspect the condition of the existing structure, mounting frames and connections and notify Maser Consulting Connecticut of any discrepancies or deficiencies before proceeding with installation.

The attached sketch is a schematic representation of the analyzed mounting frames. The contractor shall be responsible for field verifying the existing conditions, proper fit, and clearances in the field. Any mention of structural modifications are reasonable estimates and should not be used as a construction document. Construction documents depicting the required modification are obtainable from Maser Consulting Connecticut but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable manufacturer.

Maser Consulting Connecticut makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of the mounting frames. Maser Consulting Connecticut will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report.

APPENDIX A

Site Info

Maser Job Number	18963007A	
Date	4/18/2019	
Site ID	10035084	
Standard	TIA-222-H	
Structure Type	Self Support Tower	
Structure Height (ft)	80	
Structure Class	II	
Antenna Centerline (ft)	78	
Mean Base Elevation	391.57	ft AMSL
Mount Type	Sector	
Wind Speed (mph)	119	
Exposure Category	C	
Topographic Category	1	
Kzt	1.00	
Ss	0.00	
Design Ice Thickness Type	Factored ASCE 7-16 (500 - Year Return)	
Design Ice Thickness (in)	1	
Ice Wind Speed (mph)	50	
MLL Ice Thickness (in)	0	
MLL Wind Speed (mph)	30	
I (wind, no ice)	1.00	
I (wind, with ice)	1.00	
I (ice)	1.00	
GH	1.00	
Kz	1.20	
Ke	0.99	
Ks	1.00	
Ka	0.90	
Kd	0.95	
Kiz	1.09	
tiz	1.09	in
tiz_MLL	0.00	in

Seismic Calcs

R	2.0
As	1.0
I (seismic)	1.0
S1	0
Site Class	D
Fa	1.600
SDS	0.000
Cs	0.030

Wind Pressure

qz (no ice)	36.7	lb/ft2
qz (ice)	6.5	lb/ft2
qz (MLL)	2.3	lb/ft2

Seismic Multipliers

Vertical Seismic Multiplier	**0.000**
Lateral Seismic Multiplier	**0.030**

Distributed Loading (Per Mount Member)

Mount Member Description	Mount Member Shape	Wind Dist. Load (lb/ft)			Ice Dist. Load (lb/ft)	
		No Ice	Ice	MLL Ice	Ice	MLL Ice
Face Horizontal	P 2.00	**8.7**	**3.0**	**0.6**	**4.6**	-
Standoff Horizontal	P 2.00	**8.7**	**3.0**	**0.6**	**4.6**	-
Standoff Bracing	RndBar 3_4	**2.8**	**1.9**	**0.2**	**2.4**	-
Tie back	P 2.00	**8.7**	**3.0**	**0.6**	**4.6**	-
Mount Pipe 1	P 2.00	-	-	-	**4.6**	-
Mount Pipe 2	P 2.00	-	-	-	**4.6**	-
Mount Pipe 3	P 2.00	-	-	-	**4.6**	-
Mount Pipe 4	P 2.00	-	-	-	**4.6**	-
Rigid Elements	Rigid Element	-	-	-	-	-
Standoff Plates	PL 3-11/16x1/2	**3.1**	**2.0**	**0.2**	**5.4**	-
MP RE	Rigid Element	-	-	-	-	-
	-	-	-	-	-	-
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Area Loading (By Steel Grating)

Grating Type	Diamond
Grating Self Weight (psf)	5.0
Grating Ice Weight (psf)	5.1

List of Equipment

Manufacturer	Appurtenance	Type	Height	Width	Depth	Weight	Dia.	Front EPA (No Ice)		Side EPA (No Ice)		Front Wind (Ice)		Side Wind (Ice)		Front Wind (MLL ice)		Side Wind (MLL Ice)	
			(in)	(in)	(in)	(lbs)	(in)	Ca	EPA (ft^2)	Ca	EPA (ft^2)	Ca	EPA (ft^2)	Ca	EPA (ft^2)	Ca	EPA (ft^2)	Ca	EPA (ft^2)
POWERWAVE TECHNOLOGIES	7770	Flat	55	11	5	35		1.31	5.51	1.53	2.93	1.28	6.72	1.43	4.09	1.31	5.51	1.53	2.93
CCI	OPA-65R-LCUU-H6	Flat	72	14.8	7.4	73		1.31	9.67	1.49	5.53	1.28	11.23	1.43	7.04	1.31	9.67	1.49	5.53
Kathrein	80010965	Flat	78.7	20	6.9	97.6		1.26	13.80	1.55	5.85	1.25	15.56	1.47	7.48	1.26	13.80	1.55	5.85
Quintel	QS66512-2	Flat	72	12	9.6	111		1.36	8.13	1.42	6.80	1.32	9.67	1.37	8.31	1.36	8.13	1.42	6.80
POWERWAVE TECHNOLOGIES	TT19-08BP111-001	Flat	9.9	6.7	5.4	16		1.20	0.55	1.20	0.45	1.20	0.89	1.20	0.76	1.20	0.55	1.20	0.45
Ericsson	RRUS-32	Flat	27.2	12.1	7	53		1.20	2.74	1.26	1.66	1.20	3.50	1.23	2.31	1.20	2.74	1.26	1.66
	DBCT108F1V92-1	Flat	10	6	3	28.7		1.20	0.50	1.24	0.26	1.20	0.83	1.20	0.53	1.20	0.50	1.24	0.26
Ericsson	RRUS 4478 B14	Flat	18.1	13.4	8.3	59.4		1.20	2.02	1.20	1.25	1.20	2.63	1.20	1.77	1.20	2.02	1.20	1.25
Ericsson	RRUS 4478 B5	Flat	16.5	13.4	7.7	60		1.20	1.84	1.20	1.06	1.20	2.43	1.20	1.54	1.20	1.84	1.20	1.06
Ericsson	RRUS 4426 B66	Flat	14.96	13.2	5.9	48.6		1.20	1.65	1.20	0.74	1.20	2.20	1.20	1.15	1.20	1.65	1.20	0.74
Ericsson	RRUS 11	Flat	19.69	16.97	7.17	50.7		1.20	2.78	1.21	1.19	1.20	3.49	1.20	1.70	1.20	2.78	1.21	1.19
Ericsson	RRUS 32 B2	Flat	27.2	12.1	7	53		1.20	2.74	1.26	1.66	1.20	3.50	1.23	2.31	1.20	2.74	1.26	1.66
Raycap	DC6-48-60-18-8C-EV	Round	31.25	11	11	32.8	11	0.71	1.69	0.71	1.69	0.70	2.15	0.70	2.15	0.71	1.69	0.71	1.69

v7.3.24

Equipment Loading by Member Description

Site ID: 10035084

Member ID: MP1

Mount Face: Normal

Shielding %

Appurtenance #	Model #	Flipped?	Front	Side	# of cnx	Full Wind (lbs)			Wind with Ice (lbs)			Wind with MLL (lbs)			Seismic (lbs)	
						Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Vertical	Lateral
1	7770	No	0%	0%	2	**17.5**	**101.1**	**53.7**	**38.7**	**21.8**	**13.2**	**0.0**	**6.4**	**3.4**	**0.0**	**0.5**
2	TT19-08BP111-001	No	0%	0%	1	**16.0**	**20.3**	**16.4**	**14.7**	**5.8**	**4.9**	**0.0**	**1.3**	**1.0**	**0.0**	**0.5**
3	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
4	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
5	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
6	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-

Member ID: MP2

Mount Face: Normal

Shielding %

Appurtenance #	Model #	Flipped?	Front	Side	# of cnx	Full Wind (lbs)			Wind with Ice (lbs)			Wind with MLL (lbs)			Seismic (lbs)	
						Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Vertical	Lateral
1	OPA-65R-LCUU-H6	No	0%	0%	2	**36.5**	**177.5**	**101.4**	**67.7**	**36.4**	**22.8**	**0.0**	**11.3**	**6.4**	**0.0**	**1.1**
2	RRUS-32	No	0%	0%	1	**53.0**	**100.7**	**61.0**	**50.1**	**22.7**	**14.9**	**0.0**	**6.4**	**3.9**	**0.0**	**1.6**
3	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
4	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
5	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
6	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-

Member ID: MP3

Mount Face: Normal

Shielding %

Appurtenance #	Model #	Flipped?	Front	Side	# of cnx	Full Wind (lbs)			Wind with Ice (lbs)			Wind with MLL (lbs)			Seismic (lbs)	
						Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Vertical	Lateral
1	80010965	No	0%	0%	2	**48.8**	**253.2**	**107.3**	**87.9**	**50.4**	**24.2**	**0.0**	**16.1**	**6.8**	**0.0**	**1.5**
2	RRUS 4478 B14	No	0%	0%	1	**59.4**	**74.2**	**46.0**	**42.1**	**17.1**	**11.5**	**0.0**	**4.7**	**2.9**	**0.0**	**1.8**
3	RRUS 4478 B5	No	0%	0%	1	**60.0**	**67.6**	**38.9**	**38.0**	**15.7**	**10.0**	**0.0**	**4.3**	**2.5**	**0.0**	**1.8**
4	RRUS 4426 B66	No	0%	0%	1	**48.6**	**60.4**	**27.1**	**31.3**	**14.2**	**7.5**	**0.0**	**3.8**	**1.7**	**0.0**	**1.5**
5	DBCT108F1V92-1	No	0%	0%	1	**28.7**	**18.4**	**9.4**	**10.9**	**5.4**	**3.4**	**0.0**	**1.2**	**0.6**	**0.0**	**0.9**
6	DBCT108F1V92-1	No	0%	0%	1	**28.7**	**18.4**	**9.4**	**10.9**	**5.4**	**3.4**	**0.0**	**1.2**	**0.6**	**0.0**	**0.9**

Member ID: MP4

Mount Face: Normal

Shielding %

Appurtenance #	Model #	Flipped?	Front	Side	# of cnx	Full Wind (lbs)			Wind with Ice (lbs)			Wind with MLL (lbs)			Seismic (lbs)	
						Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Vertical	Lateral
1	QS66512-2	No	0%	0%	2	**55.5**	**149.3**	**124.8**	**66.4**	**31.3**	**26.9**	**0.0**	**9.5**	**7.9**	**0.0**	**1.7**
2	RRUS 11	No	0%	0%	1	**50.7**	**102.2**	**43.7**	**49.3**	**22.6**	**11.0**	**0.0**	**6.5**	**2.8**	**0.0**	**1.5**
3	RRUS 32 B2	No	0%	0%	1	**53.0**	**100.7**	**61.0**	**50.1**	**22.7**	**14.9**	**0.0**	**6.4**	**3.9**	**0.0**	**1.6**
4	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
5	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
6	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-

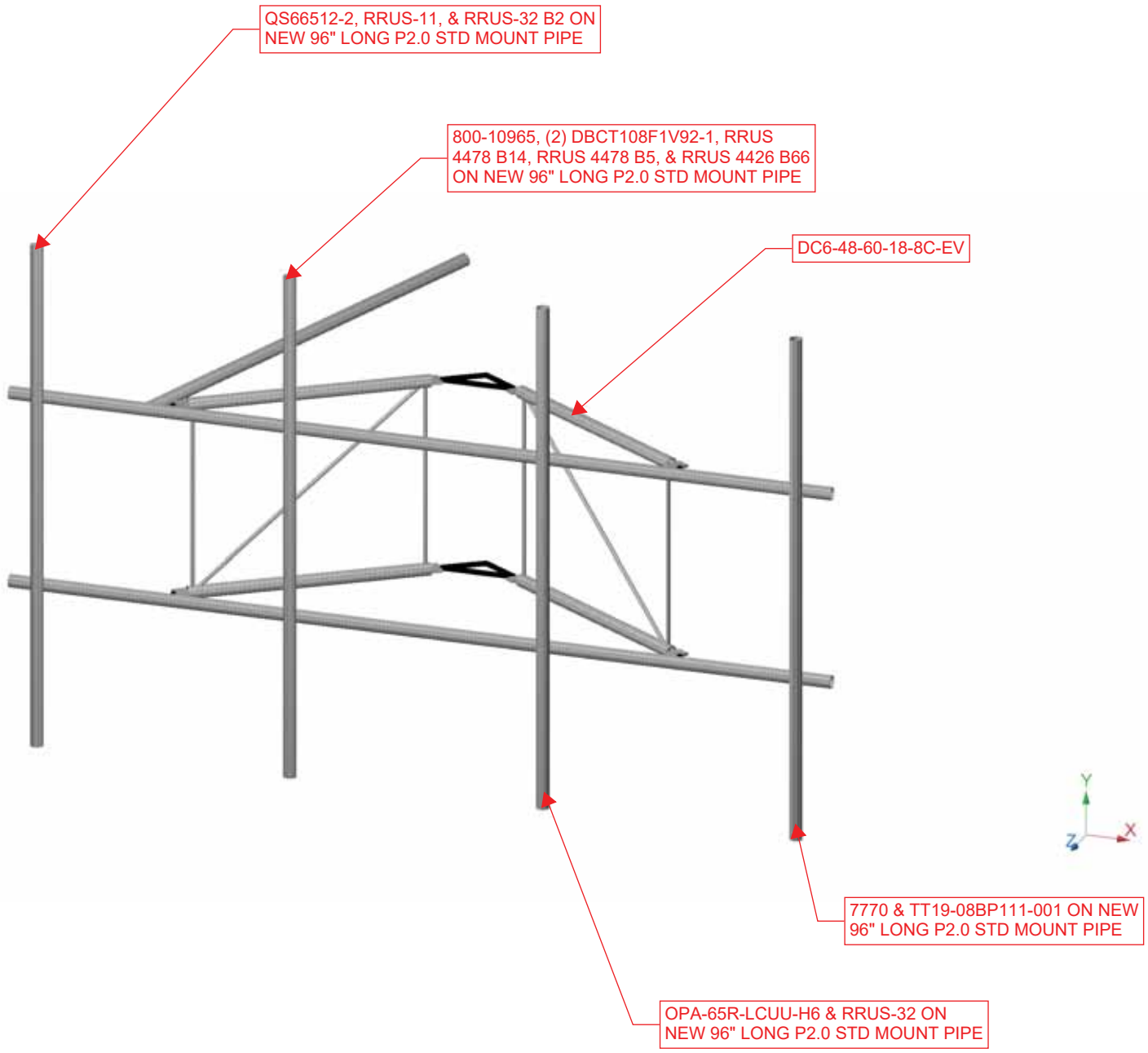
Member ID: Standoff

Mount Face: Normal

Shielding %

Appurtenance #	Model #	Flipped?	Front	Side	# of cnx	Full Wind (lbs)			Wind with Ice (lbs)			Wind with MLL (lbs)			Seismic (lbs)	
						Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Weight	Front Wind	Side Wind	Vertical	Lateral
1	DC6-48-60-18-8C-EV	No	0%	0%	1	**32.8**	**62.1**	**62.1**	**51.6**	**13.9**	**13.9**	**0.0**	**3.9**	**3.9**	**0.0**	**1.0**
2	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
3	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
4	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
5	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-
6	0	No	0%	0%	0	-	-	-	-	-	-	-	-	-	-	-

Project: 18963007A
Client: Empire
Structural Engineer: JRH
Modified: 4/18/2019



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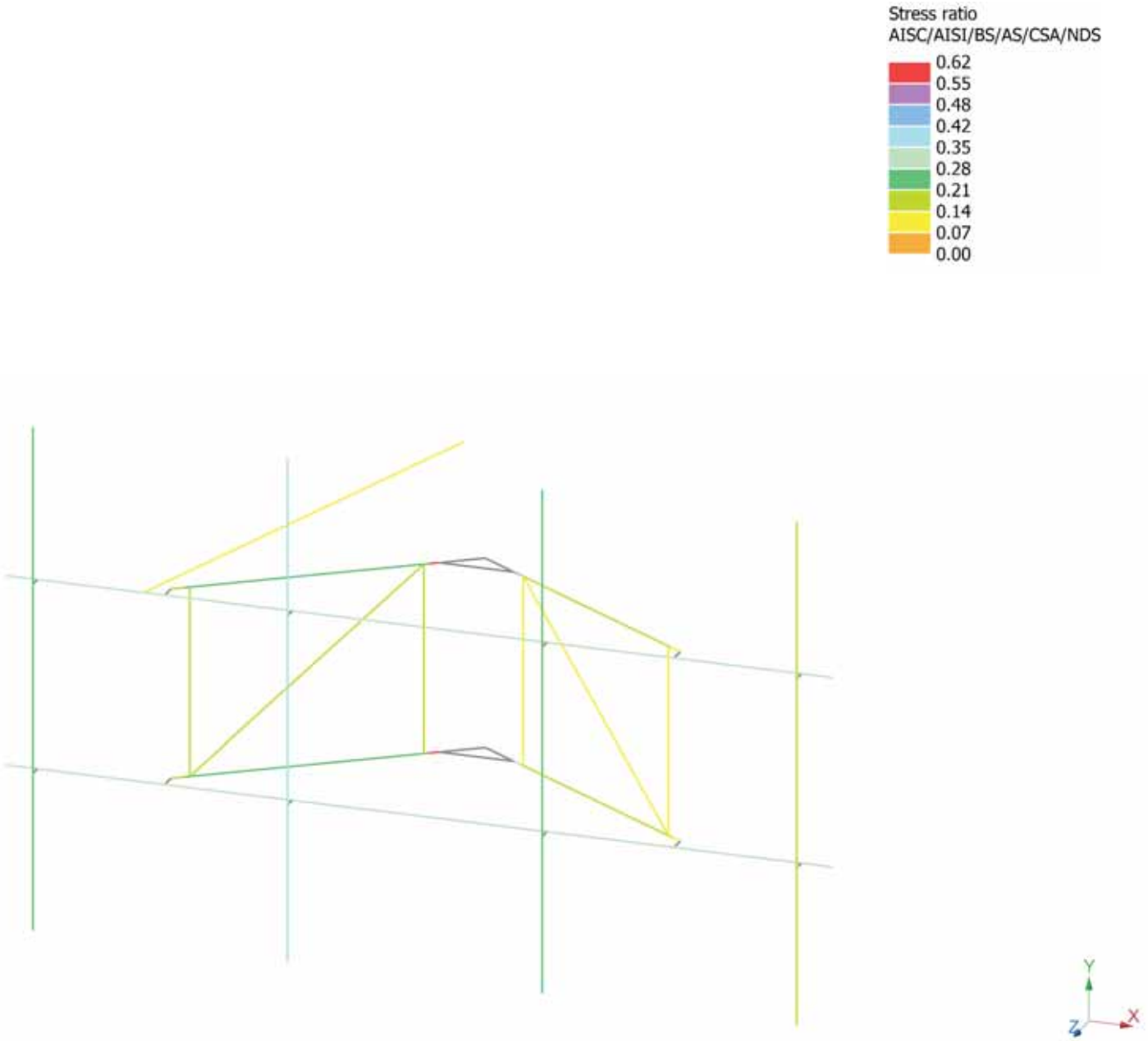

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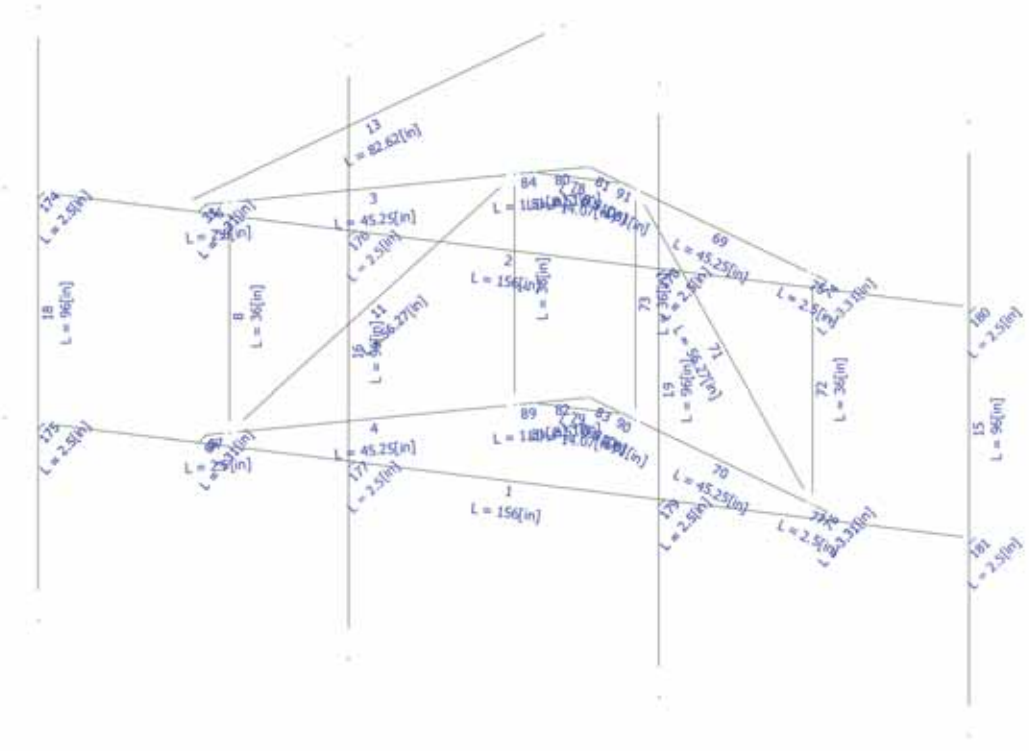

Project: 18963007A
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Structural Engineer: JRH
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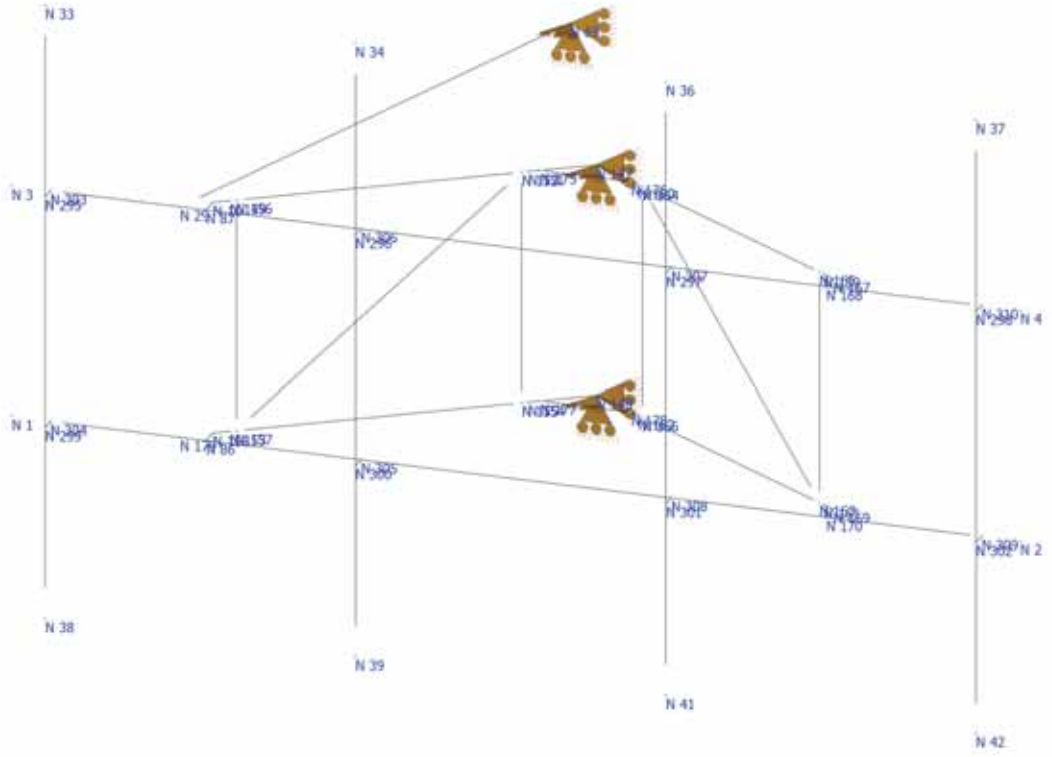

Project: 18963007A
Client: Empire
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Modified: 4/18/2019

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [in]	Y [in]	Z [in]	Rigid Floor
1	-78.00	-18.00	64.75	0
2	78.00	-18.00	64.75	0
3	-78.00	18.00	64.75	0
4	78.00	18.00	64.75	0
10	-48.00	18.00	61.4375	0
29	-52.00	18.00	64.75	0
33	-72.00	48.00	67.25	0
34	-24.00	48.00	67.25	0
36	24.00	48.00	67.25	0
37	72.00	48.00	67.25	0
38	-72.00	-48.00	67.25	0
39	-24.00	-48.00	67.25	0
41	24.00	-48.00	67.25	0
42	72.00	-48.00	67.25	0
69	-17.3205	24.00	-10.00	0
86	-48.00	-18.00	64.75	0
87	-48.00	18.00	64.75	0
147	0.00	18.00	28.75	0
148	0.00	-18.00	28.75	0
149	-45.9336	18.00	60.0303	0
151	-8.5324	18.00	34.5605	0

152	-9.359	18.00	35.1234	0
153	-45.9336	-18.00	60.0303	0
154	-8.5324	-18.00	34.5605	0
155	-9.359	-18.00	35.1234	0
156	-45.1071	18.00	59.4675	0
157	-45.1071	-18.00	59.4675	0
158	-48.00	-18.00	61.4375	0
159	45.9336	18.00	60.0303	0
160	8.5324	18.00	34.5605	0
161	45.9336	-18.00	60.0303	0
162	8.5324	-18.00	34.5605	0
163	45.1071	-18.00	59.4675	0
164	9.359	18.00	35.1234	0
165	45.1071	18.00	59.4675	0
166	9.359	-18.00	35.1234	0
167	48.00	18.00	61.4375	0
168	48.00	18.00	64.75	0
169	48.00	-18.00	61.4375	0
170	48.00	-18.00	64.75	0
175	-7.0343	18.00	33.5403	0
176	7.0343	18.00	33.5403	0
177	-7.0343	-18.00	33.5403	0
178	7.0343	-18.00	33.5403	0
179	-52.00	-18.00	64.75	0
295	-72.00	18.00	67.25	0
296	-24.00	18.00	67.25	0
297	24.00	18.00	67.25	0
298	72.00	18.00	67.25	0
299	-72.00	-18.00	67.25	0
300	-24.00	-18.00	67.25	0
301	24.00	-18.00	67.25	0
302	72.00	-18.00	67.25	0
303	-72.00	18.00	64.75	0
304	-72.00	-18.00	64.75	0
305	-24.00	-18.00	64.75	0
306	-24.00	18.00	64.75	0
307	24.00	18.00	64.75	0
308	24.00	-18.00	64.75	0
309	72.00	-18.00	64.75	0
310	72.00	18.00	64.75	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
69	1	1	1	0	0	0
147	1	1	1	0	0	0
148	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	2	Face Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
2	3	4	Face Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
3	149	151	Standoff Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
4	153	154	Standoff Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
8	156	157	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
11	157	152	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
13	29	69	Tie back	P 2.00	A53 GrB	0.00	0.00	0.00
15	37	42	Mount Pipe 1	P 2.00	A53 GrB	0.00	0.00	0.00
19	36	41	Mount Pipe 2	P 2.00	A53 GrB	0.00	0.00	0.00
16	34	39	Mount Pipe 3	P 2.00	A53 GrB	0.00	0.00	0.00
18	33	38	Mount Pipe 4	P 2.00	A53 GrB	0.00	0.00	0.00
7	152	155	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
31	10	87	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
56	149	10	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
67	153	158	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
68	158	86	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
69	159	160	Standoff Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
70	161	162	Standoff Horizontal	P 2.00	A500 GrC rounded	0.00	0.00	0.00
71	163	164	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
72	165	163	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
73	164	166	Standoff Bracing	RndBar 3_4	A572 Gr50	0.00	0.00	0.00
74	167	168	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
75	159	167	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
76	169	170	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
77	161	169	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
78	175	176	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
79	177	178	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
80	175	147	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
81	147	176	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
82	177	148	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
83	148	178	Rigid Elements	Rigid Element	A36 (weightless)	0.00	0.00	0.00
84	151	175	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
89	177	154	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
90	178	162	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
91	176	160	Standoff Plates	PL 3-11/16x1/2	A572 Gr50	0.00	0.00	0.00
174	295	303	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
175	299	304	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
176	296	306	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
177	300	305	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
178	297	307	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
179	301	308	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
180	298	310	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00
181	302	309	MP RE	Rigid Element	A36 (weightless)	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
56	90.00	0	0.00	0.00	0.00
67	90.00	0	0.00	0.00	0.00
75	90.00	0	0.00	0.00	0.00
77	90.00	0	0.00	0.00	0.00
84	90.00	0	0.00	0.00	0.00
89	90.00	0	0.00	0.00	0.00
90	90.00	0	0.00	0.00	0.00
91	90.00	0	0.00	0.00	0.00

Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
8	1	1	0	0	1	1	0	0	0	0	Full
11	1	1	0	0	1	1	0	0	0	0	Full
13	1	1	0	0	0	0	0	0	0	0	Full
7	1	1	0	0	1	1	0	0	0	0	Full
56	0	0	0	0	1	1	0	0	0	0	Full
67	0	0	0	0	1	1	0	0	0	0	Full
71	1	1	0	0	1	1	0	0	0	0	Full
72	1	1	0	0	1	1	0	0	0	0	Full
73	1	1	0	0	1	1	0	0	0	0	Full
75	0	0	0	0	1	1	0	0	0	0	Full
77	0	0	0	0	1	1	0	0	0	0	Full

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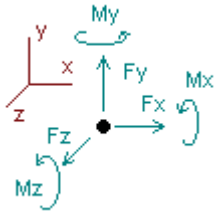
Analysis result

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

D1=1.4DL
D2=1.2DL+WLf3+1.5MLL1
D3=1.2DL+0.866WLf3+0.5WLs3+1.5MLL1
D4=1.2DL+0.5WLf3+0.866WLs3+1.5MLL1
D5=1.2DL+WLs3+1.5MLL1
D6=1.2DL-0.5WLf3+0.866WLs3+1.5MLL1
D7=1.2DL-0.866WLf3+0.5WLs3+1.5MLL1
D8=1.2DL-WLf3+1.5MLL1
D9=1.2DL-0.866WLf3-0.5WLs3+1.5MLL1
D10=1.2DL-0.5WLf3-0.866WLs3+1.5MLL1
D11=1.2DL-WLs3+1.5MLL1
D12=1.2DL+0.5WLf3-0.866WLs3+1.5MLL1
D13=1.2DL+0.866WLf3-0.5WLs3+1.5MLL1
D14=1.2DL+1.5MLL2
D15=1.2DL+WLf1
D16=1.2DL+0.866WLf1+0.5WLs1
D17=1.2DL+0.5WLf1+0.866WLs1
D18=1.2DL+WLs1
D19=1.2DL-0.5WLf1+0.866WLs1
D20=1.2DL-0.866WLf1+0.5WLs1
D21=1.2DL-WLf1
D22=1.2DL-0.866WLf1-0.5WLs1
D23=1.2DL-0.5WLf1-0.866WLs1
D24=1.2DL-WLs1
D25=1.2DL+0.5WLf1-0.866WLs1
D26=1.2DL+0.866WLf1-0.5WLs1
D27=0.9DL+WLf1
D28=0.9DL+0.866WLf1+0.5WLs1
D29=0.9DL+0.5WLf1+0.866WLs1
D30=0.9DL+WLs1
D31=0.9DL-0.5WLf1+0.866WLs1
D32=0.9DL-0.866WLf1+0.5WLs1
D33=0.9DL-WLf1
D34=0.9DL-0.866WLf1-0.5WLs1
D35=0.9DL-0.5WLf1-0.866WLs1
D36=0.9DL-WLs1
D37=0.9DL+0.5WLf1-0.866WLs1
D38=0.9DL+0.866WLf1-0.5WLs1
D39=1.2DL+Di+WLf2

D40=1.2DL+Di+0.866WLf2+0.5WLs2
D41=1.2DL+Di+0.5WLf2+0.866WLs2
D42=1.2DL+Di+WLs2
D43=1.2DL+Di-0.5WLf2+0.866WLs2
D44=1.2DL+Di-0.866WLf2+0.5WLs2
D45=1.2DL+Di-WLf2
D46=1.2DL+Di-0.866WLf2-0.5WLs2
D47=1.2DL+Di-0.5WLf2-0.866WLs2
D48=1.2DL+Di-WLs2
D49=1.2DL+Di+0.5WLf2-0.866WLs2
D50=1.2DL+Di+0.866WLf2-0.5WLs2
D51=1.2DL+Ev+Ehx
D52=1.2DL+Ev+Ehz
D53=1.2DL+Ev-Ehx
D54=1.2DL+Ev-Ehz
D55=0.9DL-Ev+Ehx
D56=0.9DL-Ev+Ehz
D57=0.9DL-Ev-Ehx
D58=0.9DL-Ev-Ehz

		Forces						Moments					
Node		**Fx** [Lb]	**lc**	**Fy** [Lb]	**lc**	**Fz** [Lb]	**lc**	**Mx** [Lb*ft]	**lc**	**My** [Lb*ft]	**lc**	**Mz** [Lb*ft]	**lc**
69	Max	675.353	D23	136.082	D23	1512.884	D29	0.00000	D1	0.00000	D1	0.00000	D1
	Min	-675.333	D29	-109.556	D29	-1512.927	D23	0.00000	D1	0.00000	D1	0.00000	D1
147	Max	2031.656	D17	1750.484	D14	464.730	D37	0.00000	D1	0.00000	D1	0.00000	D1
	Min	-1082.132	D35	432.905	D34	-2963.930	D43	0.00000	D1	0.00000	D1	0.00000	D1
148	Max	36.015	D30	1522.338	D14	2879.500	D39	0.00000	D1	0.00000	D1	0.00000	D1
	Min	-1006.836	D48	466.016	D37	-205.956	D33	0.00000	D1	0.00000	D1	0.00000	D1

Project: 18963007A
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Modified: 4/18/2019

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

D1=1.4DL
D2=1.2DL+WLf3+1.5MLL1
D3=1.2DL+0.866WLf3+0.5WLs3+1.5MLL1
D4=1.2DL+0.5WLf3+0.866WLs3+1.5MLL1
D5=1.2DL+WLs3+1.5MLL1
D6=1.2DL-0.5WLf3+0.866WLs3+1.5MLL1
D7=1.2DL-0.866WLf3+0.5WLs3+1.5MLL1
D8=1.2DL-WLf3+1.5MLL1
D9=1.2DL-0.866WLf3-0.5WLs3+1.5MLL1
D10=1.2DL-0.5WLf3-0.866WLs3+1.5MLL1
D11=1.2DL-WLs3+1.5MLL1
D12=1.2DL+0.5WLf3-0.866WLs3+1.5MLL1
D13=1.2DL+0.866WLf3-0.5WLs3+1.5MLL1
D14=1.2DL+1.5MLL2
D15=1.2DL+WLf1
D16=1.2DL+0.866WLf1+0.5WLs1
D17=1.2DL+0.5WLf1+0.866WLs1
D18=1.2DL+WLs1
D19=1.2DL-0.5WLf1+0.866WLs1
D20=1.2DL-0.866WLf1+0.5WLs1
D21=1.2DL-WLf1
D22=1.2DL-0.866WLf1-0.5WLs1
D23=1.2DL-0.5WLf1-0.866WLs1
D24=1.2DL-WLs1
D25=1.2DL+0.5WLf1-0.866WLs1
D26=1.2DL+0.866WLf1-0.5WLs1
D27=0.9DL+WLf1
D28=0.9DL+0.866WLf1+0.5WLs1
D29=0.9DL+0.5WLf1+0.866WLs1
D30=0.9DL+WLs1
D31=0.9DL-0.5WLf1+0.866WLs1
D32=0.9DL-0.866WLf1+0.5WLs1
D33=0.9DL-WLf1
D34=0.9DL-0.866WLf1-0.5WLs1
D35=0.9DL-0.5WLf1-0.866WLs1
D36=0.9DL-WLs1
D37=0.9DL+0.5WLf1-0.866WLs1
D38=0.9DL+0.866WLf1-0.5WLs1
D39=1.2DL+Di+WLf2
D40=1.2DL+Di+0.866WLf2+0.5WLs2
D41=1.2DL+Di+0.5WLf2+0.866WLs2
D42=1.2DL+Di+WLs2
D43=1.2DL+Di-0.5WLf2+0.866WLs2
D44=1.2DL+Di-0.866WLf2+0.5WLs2
D45=1.2DL+Di-WLf2
D46=1.2DL+Di-0.866WLf2-0.5WLs2
D47=1.2DL+Di-0.5WLf2-0.866WLs2
D48=1.2DL+Di-WLs2
D49=1.2DL+Di+0.5WLf2-0.866WLs2
D50=1.2DL+Di+0.866WLf2-0.5WLs2
D51=1.2DL+Ev+Ehx
D52=1.2DL+Ev+Ehz

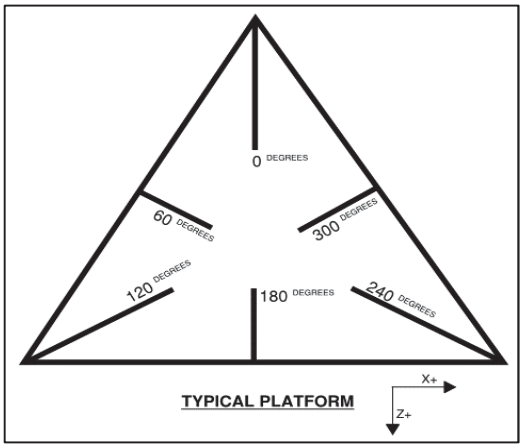
D53=1.2DL+Ev-Ehx
D54=1.2DL+Ev-Ehz
D55=0.9DL-Ev+Ehx
D56=0.9DL-Ev+Ehz
D57=0.9DL-Ev-Ehx
D58=0.9DL-Ev-Ehz

Description	Section	Member	Ratio	Status	Reference
Face Horizontal	***P 2.00***	**1**	0.31	OK	
		2	0.34	OK	
Mount Pipe 1		**15**	0.19	OK	
Mount Pipe 2		**19**	0.26	OK	
Mount Pipe 3		**16**	**0.36**	**OK**	
Mount Pipe 4		**18**	0.26	OK	
Standoff Bracing	***RndBar 3_4***	**8**	**0.18**	**OK**	
		11	0.15	OK	
		7	0.18	OK	
		71	0.12	OK	
		72	0.12	OK	
		73	0.12	OK	
Standoff Horizontal	***P 2.00***	**3**	**0.26**	**OK**	
		4	0.26	OK	
		69	0.20	OK	
		70	0.21	OK	
Standoff Plates	***PL 3-11/16x1/2***	**56**	0.19	OK	
		67	0.19	OK	
		75	0.12	OK	
		77	0.13	OK	
		84	**0.62**	**OK**	
		89	0.56	OK	
		90	0.37	OK	
		91	0.46	OK	
Tie back	***P 2.00***	**13**	**0.09**	**OK**	

Mount-to-Tower Connection Check

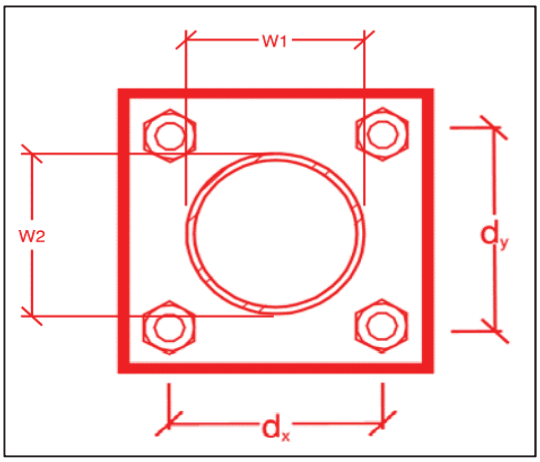
RAM Model Data

Nodes *(numbered per RAM)*	Orientation *(per graphic of typical platform)*
147	180
148	180



Tower Connection Bolt Checks

Any moment resistance?	no
Bolt Quantity per Reaction	4
d_x (in) *(Delta X of typ. bolt config. sketch)*	
d_y (in) *(Delta Y of typ. bolt config. sketch)*	
Bolt Type	A307
Bolt Diameter (in)	0.625
Required Tensile Strength (kips)	3.0
Required Shear Strength (kips)	2.2
Tensile Strength / bolt (kips)	10.0
Shear Strength / bolt (kips)	6.0
Tensile Capacity Overall	**7.4%**
Shear Capacity Overall	**9.1%**

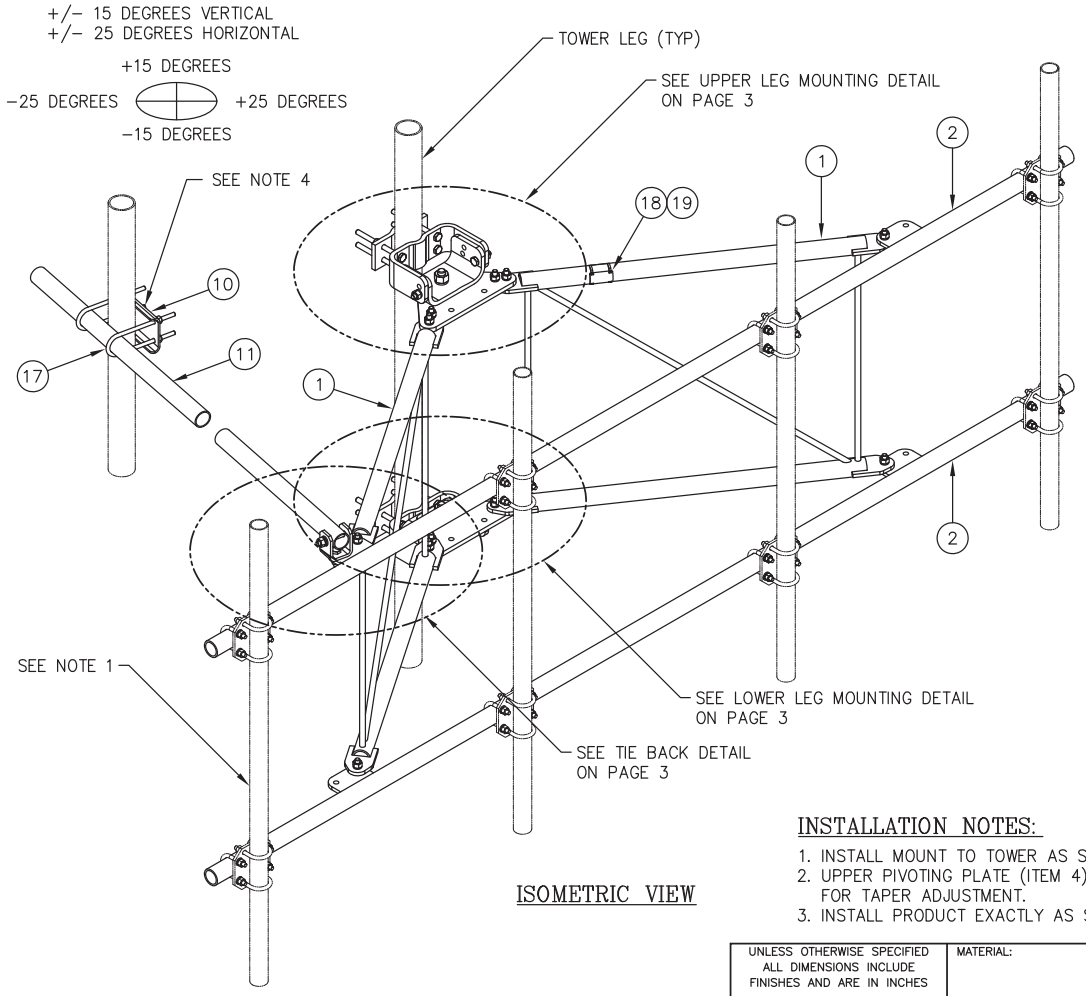


v2.4

Note: Tension reduction not required if tension or shear capacity < 30%

TIEBACK ANGLE RANGE DETAIL

+/− 15 DEGREES VERTICAL
+/− 25 DEGREES HORIZONTAL



ISOMETRIC VIEW

C10857001C 12' HD V−BOOM ASSEMBLY W/TIEBACK

ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	CW01222	WELDMENT, STANDOFF ARM	126
2.	2	CW01223	WELDMENT, FACE PIPE	147
3.	2	CS03109	PLATE, ROTATING	34
4.	1	CS03110	PLATE, PIVOTING (UPPER)	16
5.	1	CS03111	PLATE, LEG CLAMP (UPPER)	17
6.	1	CS03112	PLATE, PIVOTING (LOWER)	14
7.	1	CS03113	PLATE, LEG CLAMP (LOWER)	17
8.	2	CS03114	PLATE, LEG CLAMP (BACK)	14
9.	1	CS00098	PLATE, TIE BACK SWIVEL	3
10.	1	CS03285	PLATE, TIE BACK CLAMP	4
11.	1	CS03333	PIPE, TIE BACK	38
12.	2	C40026073	BOLT ASSEMBLY, 1 ø X 3 A325	4
13.	8	C40140004	BOLT ASSEMBLY, 5/8 ø X 8 A307	13
14.	1	C40026033	BOLT ASSEMBLY, 5/8 ø X 4 1/2 A325	1
15.	12	C40026025	BOLT ASSEMBLY, 5/8 ø X 2 1/2 A325	6
16.	5	C40026024	BOLT ASSEMBLY, 5/8 ø X 2 1/4 A325	3
17.	2	C40034183	U−BOLT ASSEMBLY, 1/2 ø X 2 9/16 C−C	3
18.	1	Z30992001	MOUNT CLASSIFICATION TAG C10857001C	1
19.	2	C40062103	STAINLESS STEEL SELF−LOCKING CABLE TIE	1
			TOTAL WEIGHT	462

PACKAGING NOTE

CK00386 INCLUDES ITEMS 1, 3, 4, 5, 6, 7, 12 & 15 (8 QTY)
CK00387 INCLUDES ITEMS 2, 8, 9, 10, 11, 13, 14, 15 (4 QTY), 16, 17, 18 & 19

INSTALLATION NOTES:

1. INSTALL MOUNT TO TOWER AS SHOWN, SO THAT WELDED STANDOFF DIAGONAL IS SLOPING DOWNWARD FROM TOWER END TO FACE PIPE END.
2. UPPER PIVOTING PLATE (ITEM 4) HAS THREE HOLES ON EACH SIDE AND UPPER LEG CLAMP PLATE (ITEM 5) HAS TWO HOLES ON EACH SIDE FOR TAPER ADJUSTMENT.
3. INSTALL PRODUCT EXACTLY AS SHOWN IN DRAWING, WITH ALL BOLTS FACING UPWARDS.

NOTES:

1. MOUNTING PIPES & CROSSOVER PLATE KITS MUST BE PURCHASED SEPARATELY.
2. QUANTITIES SHOWN IN LISTS OF MATERIAL ARE FOR ONE (1) V−BOOM ONLY.
3. THIS V−BOOM WILL MOUNT TO THE FOLLOWING:1 1/2"ø TO 5 9/16"ø ROUND LEG.
4. TIEBACK MUST BE CONNECTED TO A RIGID MEMBER THAT PROVIDES ADEQUATE SUPPORT WITHIN THE LIMITS NOTED ABOVE IN THE TIEBACK ANGLE RANGE DETAIL UNLESS APPROVED BY THE ENGINEER OF RECORD.

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16"
ANGLES ± 1/2 DEG.
DECIMALS ± .010"

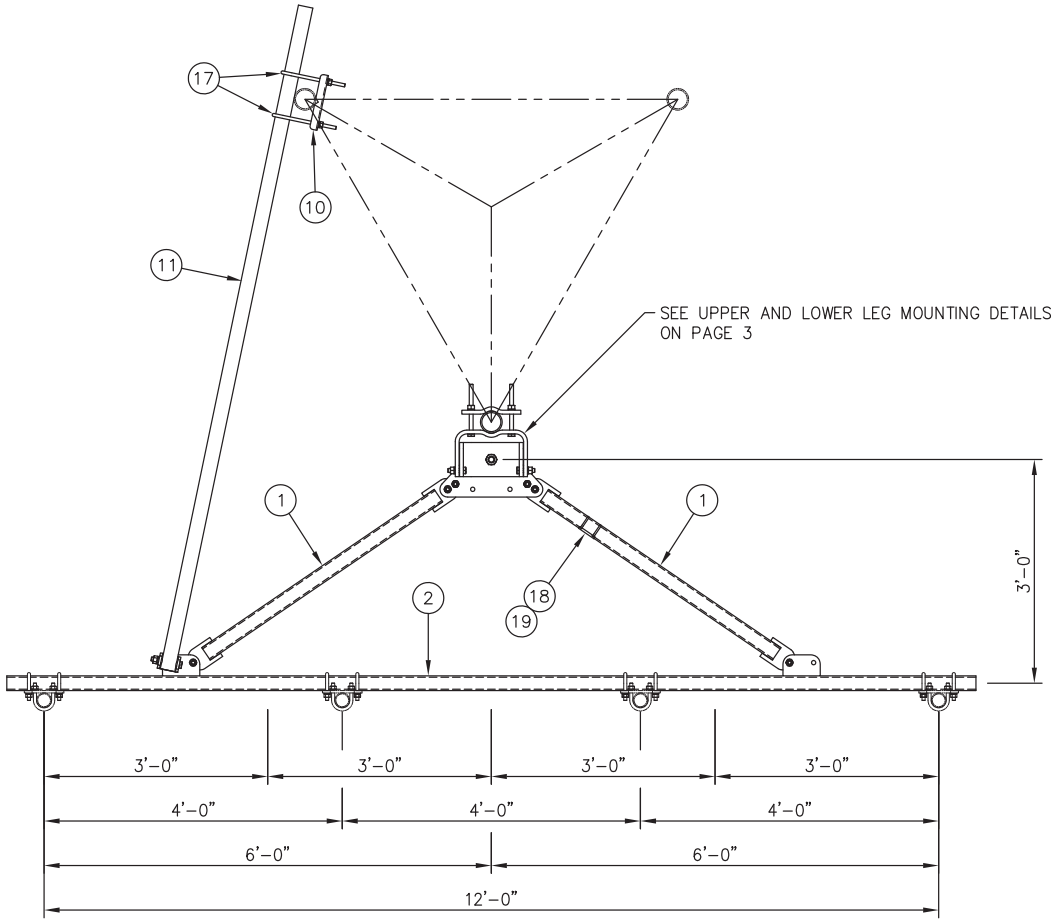
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries™
Towers and Poles

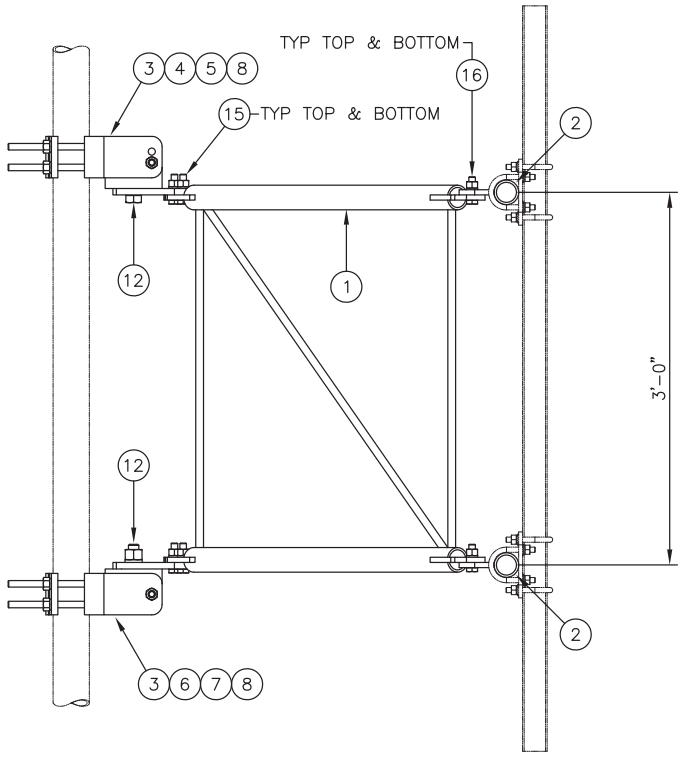
12' HD V−BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

		SIZE	DRAWING NO.	REV
DATE	12/22/15	B	C10857001C	3
DRAWN BY	WRF			
CHECKED BY	EK	SCALE None	PAGE 1 OF 3	



MOUNTING OPTIONS

SHOWING MOUNTING PIPE PLACEMENTS



SIDE VIEW

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16"
ANGLES ± 1/2 DEG.
DECIMALS ± .010"

MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

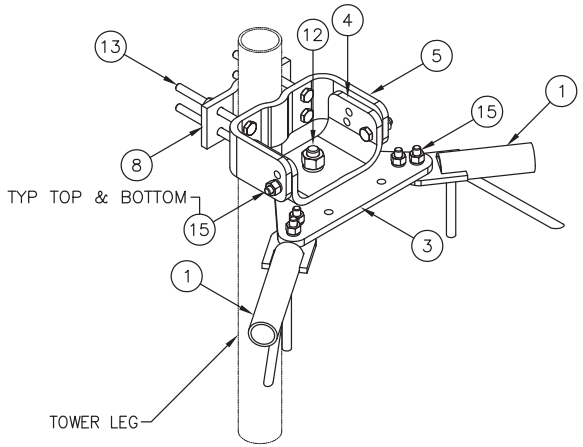
Sabre Industries™
Towers and Poles

12' HD V-BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

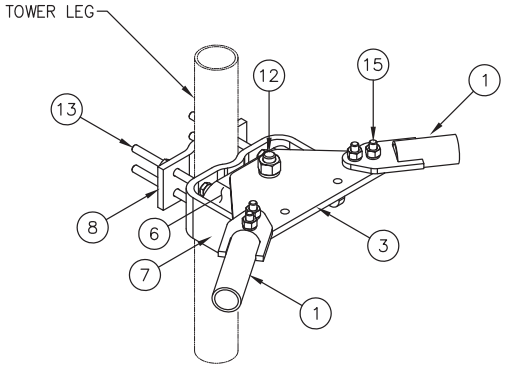
DATE	12/22/15
DRAWN BY	WRF
CHECKED BY	EK

SIZE	DRAWING NO.	REV
B	C10857001C	3

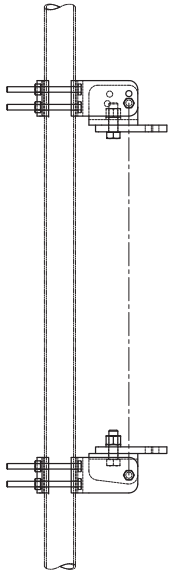
SCALE	PAGE
None	2 OF 3



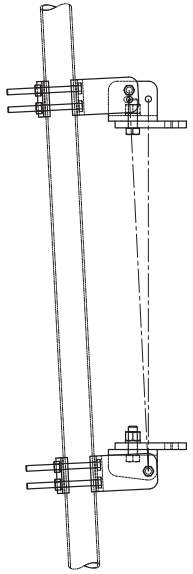
UPPER LEG MOUNTING DETAIL



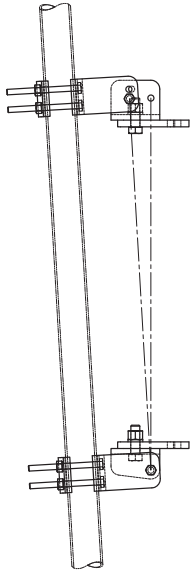
LOWER LEG MOUNTING DETAIL



STRAIGHT
TOWER SECTION

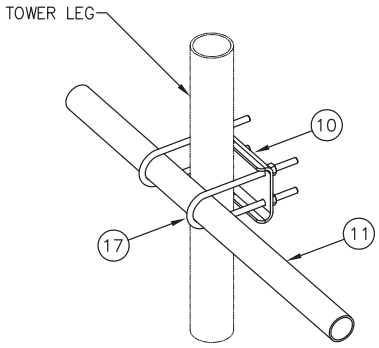


TAPERED
1'–9 IN 20' SLOPE

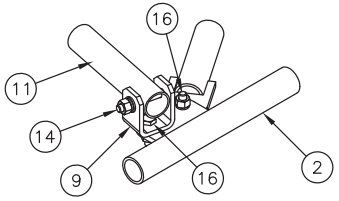


TAPERED
2' IN 20' SLOPE

--------PIVOTING OPTIONS--------



TIE BACK DETAIL
AT TOWER LEG



TIE BACK DETAIL
AT ANTENNA MOUNTING FRAME

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"	MATERIAL: TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
3	10/19/16	KLE	DEL	ADDED INSTALLATION NOTES
2	02/05/16	DLW	DEL	ADDED PACKAGING NOTE
1	01/21/16	KLE	EK	REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries™
Towers and Poles

12' HD V–BOOM ASSEMBLY W/TIEBACK (3' STANDOFF) W/NO ANTENNA MOUNTING PIPES

DATE	12/22/15
DRAWN BY	WRF
CHECKED BY	EK

SIZE	DRAWING NO.	REV
B	C10857001C	3

SCALE	PAGE
None	3 OF 3

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Self-Support Tower Modifications

FOR

CT2168 – MT. Tom Wallingford

FA #: 10035084
23 Wayne Road
Wallingford, CT 06492
New Haven County

LTE 5G NR Upgrade – MRCTB032262
LTE 6C – MRCTB032233
LTE 7C – MRCTB032242

Tower Utilization (before Modifications): 109.2%
Tower Utilization (after Modifications): 96.8%
Foundation Utilization: 49.2%
Anchor Utilization: 93.7%

November 16, 2018

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950

STATE OF CONNECTICUT
PETROS ISOUKALIS
32557
PROFESSIONAL ENGINEER

Petros E. Isoukalis, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

MC Project No. 18963007A

www.maserconsulting.com

Objective:

The objective of this report is to determine the capacity of the existing modified self-support tower at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on May 14, 2018 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

• Failing Structural Analysis Report, prepared by Maser Consulting, P.A., dated November 02, 2018.
• Structural Analysis Report, prepared by Centek Engineering, dated January 5, 2017.
• RFDS 2346933 provided by Smartlink, dated June 14, 2018.

The proposed **AT&T** equipment is to be supported on a proposed antenna support mount constructed of structural steel antenna support pipes supported by pipes at a centerline of approximately 78'-0" above ground level. This report is based only upon this information.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, Incorporating the 2015 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 125 mph (3 Second Gust)
    - Basic Wind Speed – 97 mph (3 Second Gust)
    - Exposure Category – C
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 0.75"
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Maser Consulting Connecticut understands the final **AT&T** loading to be the following:

- (3) 7770 Antennas (Existing)
- (3) OPA-65R-LCUU-H6 Antennas (Existing)
- **(3) 800-10965 Antennas (Proposed)**
- (3) QS66512-2 Antennas (Existing)
- (2) DC6 (Existing)
- **(1) DC6 (Proposed)**
- (3) TMAs (Existing)
- (3) RRUS 32 (Existing)
- **(3) B14 4478 RRUS (Proposed)**
- **(3) 4478 B5 RRUS (Proposed)**
- **(3) 4426 B66 RRUS (Proposed)**
- (3) RRUS 11 (Existing)
- (3) RRUS-32 B2 (Existing)
- **(6) Low Band Combiners (Proposed)**

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing modified self-support structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Parameters and Assumptions:

The following design parameters have been utilized in this report:

- ***It is assumed that all tower, foundation, soil parameters and appurtenance information in the referenced analysis is accurate and reflective of the current condition of the tower.***
- The existing antenna mounts shall be removed and replaced with larger sector frames.

Tower Modification Descriptions:

The following tower modifications have been utilized in this report:

- Install L2x2x1/4 secondary horizontal members between elevation 20' to 25.1' (two bays) and 0' to 10' (four bays).

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing modified tower was analyzed for the loading in the applicable codes and standards. The modified tower has been determined to be structurally **ADEQUATE** to support the proposed and existing loading, based upon the aforementioned assumptions. The self-support tower has been determined to be stressed to a maximum of **96.8%** of its structural capacity with the maximum usage occurring at the tower legs between elevations 0'-2.6'. Therefore, the proposed **AT&T** installation **CAN** be installed as intended in all sectors, **once the proposed modifications are properly installed.**

Additionally, Maser Consulting Connecticut has analyzed the existing foundation and anchor bolts based off of the information provided in the referenced analysis. Maser Consulting Connecticut has determined the foundation to be stressed to a maximum of **49.2%** in overturning and the anchor bolts are stressed to a maximum of **93.7%** of their capacity.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.
Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Dejian Xu, P.E.
Project Engineer

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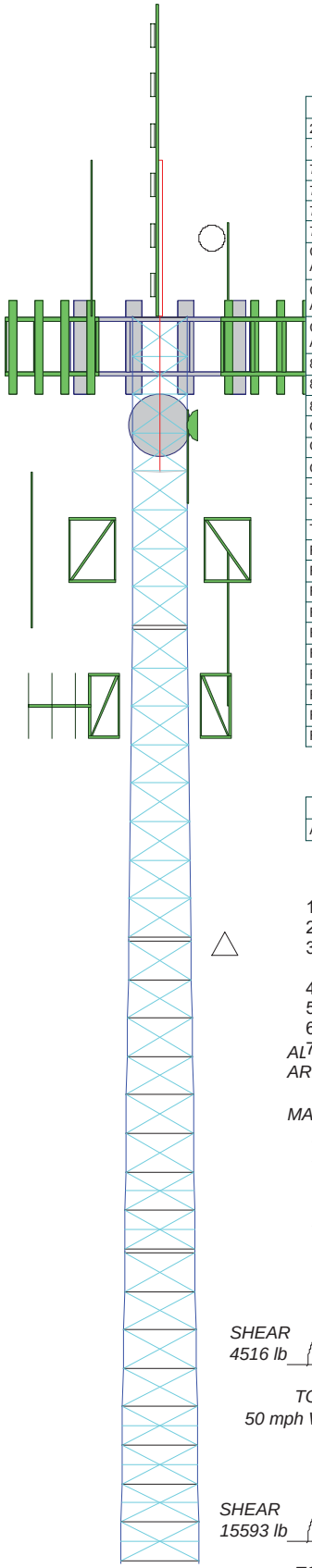
MASER CONSULTING
— CONNECTICUT—

APPENDIX A

Section		T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs					SR 2 1/2									SR 2 1/4				SR 2	SR 1 1/2	P4x.237
Leg Grade																	A572-50			A53-B-35
Diagonals														SR 7/8					SR 3/4	N.A.
Diagonal Grade																	A572-50			N.A.
Top Girts					SR 7/8				SR 1					SR 7/8			SR 1		L3 1/2x3 1/2x5/16	N.A.
Bottom Girts		SR 1				N.A.				SR 1				N.A.					SR 3/4	N.A.
Horizontals							N.A.				L2x2x1/4								SR 7/8	N.A.
Sec. Horizontals			L2x2x1/4				N.A.				L2x2x1/4							N.A.		
Face Width (ft)	54.9375	4.875	4.8125	4.75	4.6875	4.625	4.5625	4.5	4.4375	4.375	4.3125	4.25	4.1875	4.125	4.0625	4	32 @ 2.46875		3.5	0.375
# Panels @ (ft)																				N.A.
Weight (lb)	6301.9	334.0	281.5	279.7	278.0	228.8	227.7	226.5	238.7	289.5	242.8	197.4	196.3	195.2	194.1	193.0	203.4	1354.0	1027.8	113.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 8 Bay Di-Pole	90	RRUS 4426 B66 (att)	78
10' Omni	85	RRUS 4426 B66 (att)	78
7' Whip	83	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partiall Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	2' dish	73
TMA (att)	78	4' dish	73
TMA (att)	78	1.5" Dia 4' Omni w/Pipe Mount	65
TMA (att)	78	6' Side Arm	65
RRUS 32 (att)	78	6' Side Arm	65
RRUS 32 (att)	78	7' Whip	65
RRUS 32 (att)	78	10' Omni	65
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	10' Omni	55
RRUS 4478 B5 (att)	78	10' Yagi	55
RRUS 4478 B5 (att)	78		
RRUS 4478 B5 (att)	78		
RRUS 4426 B66 (att)	78		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

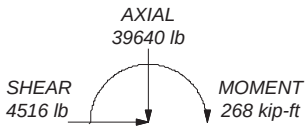
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 96.8%

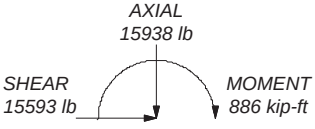
ALL ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 209930 lb
SHEAR: 9131 lb

UPLIFT: -199608 lb
SHEAR: 9201 lb



TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 2 kip-ft
REACTIONS - 97 mph WIND

Maser Consulting, P.A.
2000 Midlantic Drive, Suite 100
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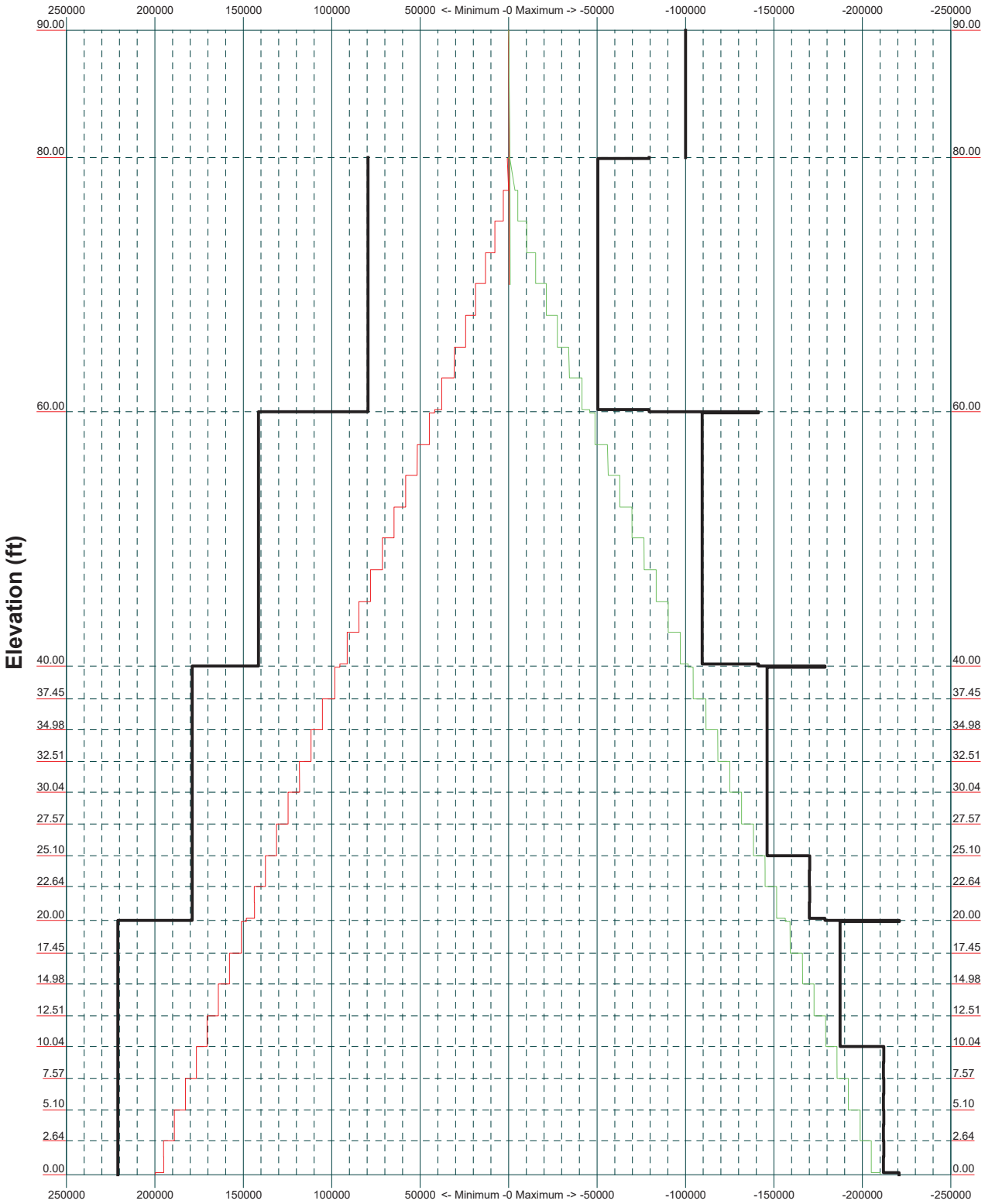
Job: 18963007A		
Project: CT2168		
Client: AT&T	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 11/12/18	Scale: NTS
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-1

TIA-222-G - 97 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— **Leg Compression (lb)**



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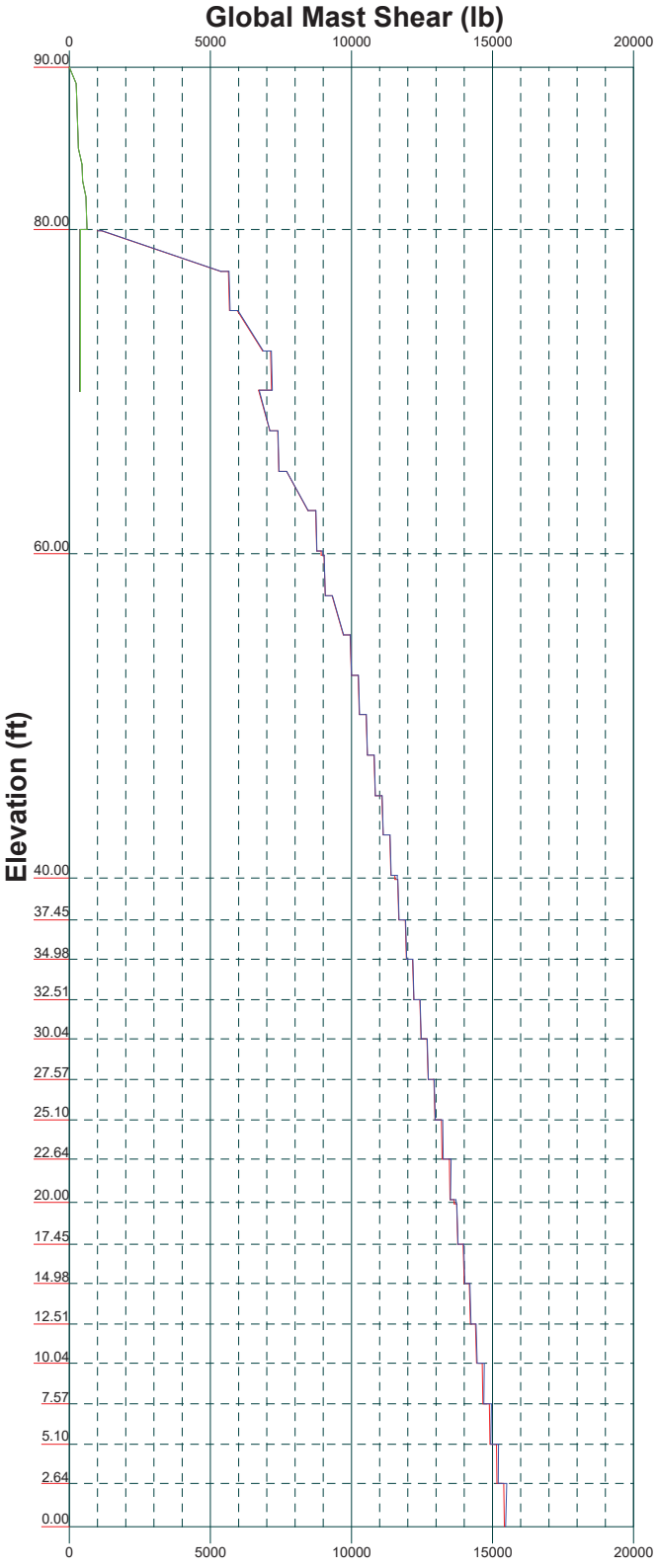
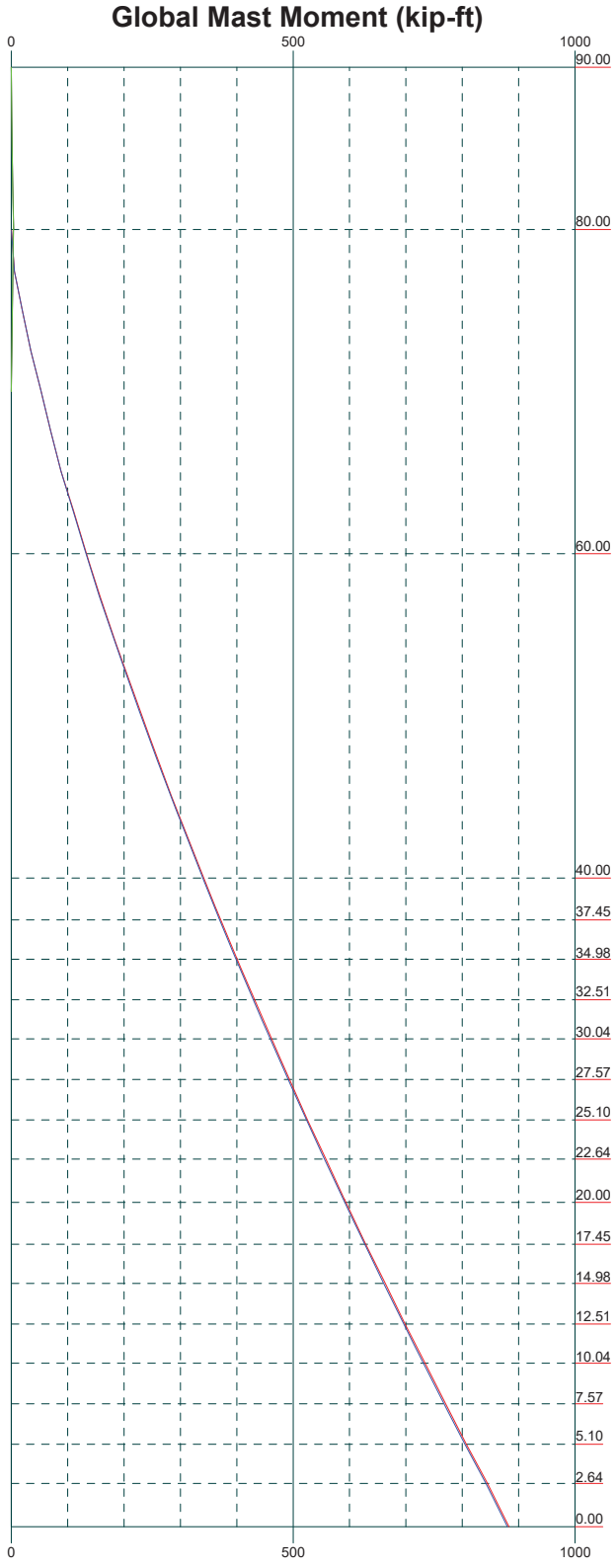
Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-3	

TIA-222-G - 97 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz





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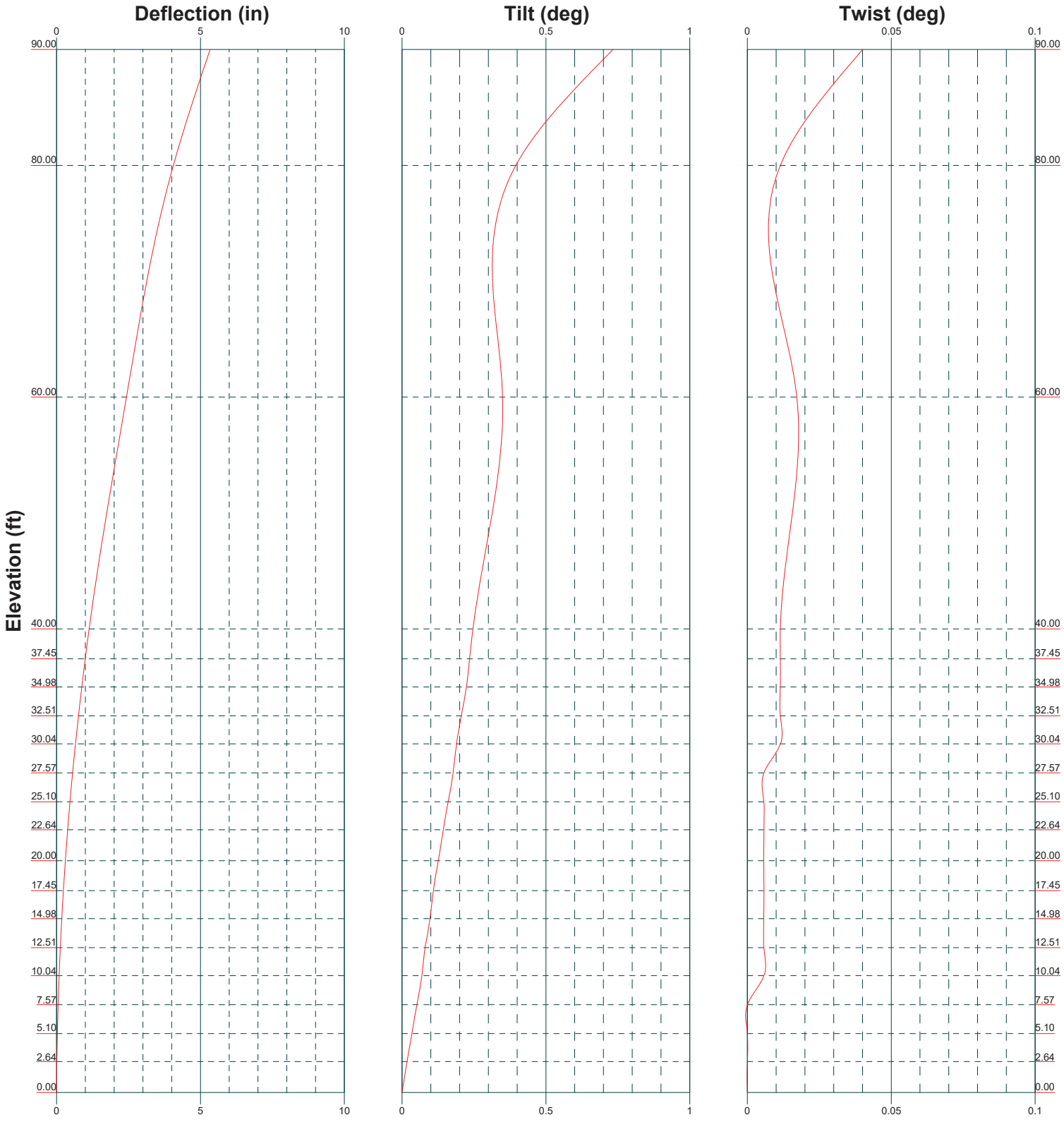
Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.er		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



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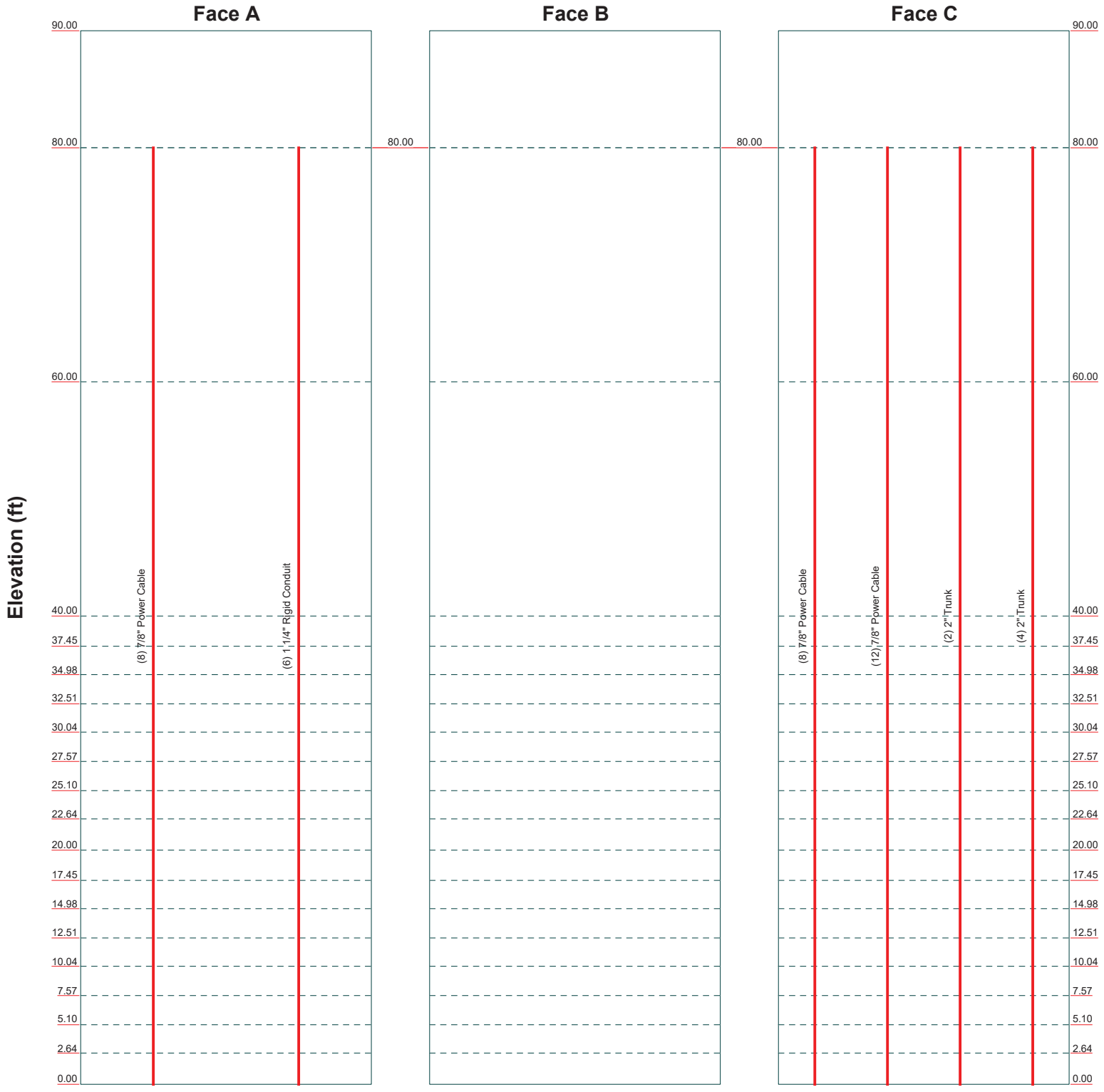
Job: ***18963007A***			
Project: ***CT2168***			
Client: AT&T	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 11/12/18	Scale: NTS	
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 90'

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



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Job: ***18963007A***		
Project: ***CT2168***		
Client: AT&T	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 11/12/18	Scale: NTS
Path: R:\Projects\2018\18963000A\18963007A\Structural\Tower Analysis\Rev 1 -MOD\tnx Tower\CT2168.eri		Dwg No. E-7

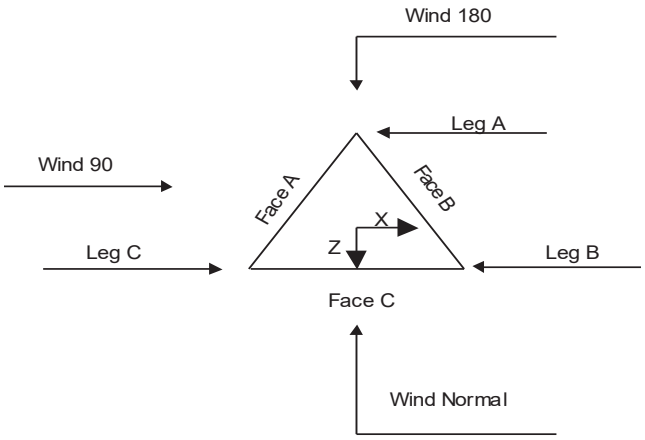
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 90.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 5.00 ft at the base.
An index plate is provided at the 3x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	90.00-80.00	10.00	P4x.237	A53-B-35 (35 ksi)	10.00

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 90.00-80.00				1	1	1.05			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	80.00-60.00			3.50	1	20.00
T2	60.00-40.00			3.50	1	20.00
T3	40.00-37.45			4.00	1	2.55
T4	37.45-34.98			4.06	1	2.47
T5	34.98-32.51			4.13	1	2.47

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T6	32.51-30.04			4.19	1	2.47
T7	30.04-27.57			4.25	1	2.47
T8	27.57-25.10			4.31	1	2.47
T9	25.10-22.64			4.38	1	2.47
T10	22.64-20.00			4.44	1	2.64
T11	20.00-17.45			4.50	1	2.55
T12	17.45-14.98			4.56	1	2.47
T13	14.98-12.51			4.63	1	2.47
T14	12.51-10.04			4.69	1	2.47
T15	10.04-7.57			4.75	1	2.47
T16	7.57-5.10			4.81	1	2.47
T17	5.10-2.64			4.88	1	2.47
T18	2.64-0.00			4.94	1	2.64

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	80.00-60.00	2.47	X Brace	No	Yes	1.0000	2.0000
T2	60.00-40.00	2.47	X Brace	No	Yes	1.0000	2.0000
T3	40.00-37.45	2.47	X Brace	No	Yes	1.0000	0.0000
T4	37.45-34.98	2.47	X Brace	No	Yes	0.0000	0.0000
T5	34.98-32.51	2.47	X Brace	No	Yes	0.0000	0.0000
T6	32.51-30.04	2.47	X Brace	No	Yes	0.0000	0.0000
T7	30.04-27.57	2.47	X Brace	No	Yes	0.0000	0.0000
T8	27.57-25.10	2.47	X Brace	No	Yes	0.0000	0.0000
T9	25.10-22.64	2.47	X Brace	No	Yes	0.0000	0.0000
T10	22.64-20.00	2.47	X Brace	No	Yes	0.0000	2.0000
T11	20.00-17.45	2.47	X Brace	No	Yes	1.0000	0.0000
T12	17.45-14.98	2.47	X Brace	No	Yes	0.0000	0.0000
T13	14.98-12.51	2.47	X Brace	No	Yes	0.0000	0.0000
T14	12.51-10.04	2.47	X Brace	No	Yes	0.0000	0.0000
T15	10.04-7.57	2.47	X Brace	No	Yes	0.0000	0.0000
T16	7.57-5.10	2.47	X Brace	No	Yes	0.0000	0.0000
T17	5.10-2.64	2.47	X Brace	No	Yes	0.0000	0.0000
T18	2.64-0.00	2.47	X Brace	No	Yes	0.0000	2.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 80.00-60.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 37.45-34.98	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T5 34.98-32.51	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 32.51-30.04	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 30.04-27.57	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 27.57-25.10	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 25.10-22.64	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 22.64-20.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 20.00-17.45	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T12 17.45-14.98	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T13 14.98-12.51	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 12.51-10.04	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T15 10.04-7.57	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T16 7.57-5.10	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 5.10-2.64	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 2.64-0.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 80.00-60.00	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 37.45-34.98	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T5 34.98-32.51	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 32.51-30.04	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T7 30.04-27.57	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T8 27.57-25.10	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T9 25.10-22.64	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10 22.64-20.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T11 20.00-17.45	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T12 17.45-14.98	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 14.98-12.51	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T14 12.51-10.04	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T15 10.04-7.57	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T16 7.57-5.10	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T17 5.10-2.64	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T18 2.64-0.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-37.45	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 37.45-34.98	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 34.98-32.51	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 32.51-30.04	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 30.04-27.57	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 27.57-25.10	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 25.10-22.64	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 22.64-20.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 20.00-17.45	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T12 17.45-14.98	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T13 14.98-12.51	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 12.51-10.04	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T15 10.04-7.57	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T16 7.57-5.10	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 5.10-2.64	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 2.64-0.00	None	Flat Bar		A36	Solid Round	7/8	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
				(36 ksi)			(50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 25.10-22.64	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T10 22.64-20.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 10.04-7.57	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 7.57-5.10	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 5.10-2.64	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 2.64-0.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 40.00-37.45	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 37.45-34.98	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 34.98-32.51	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 32.51-30.04	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 30.04-27.57	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 27.57-25.10	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 25.10-22.64	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 22.64-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-17.45	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T12	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
17.45-14.98			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
14.98-12.51			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
12.51-10.04			(36 ksi)						
T15 10.04-7.57	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T16 7.57-5.10	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T17 5.10-2.64	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T18 2.64-0.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						

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	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
40.00-37.45				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
37.45-34.98				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
34.98-32.51				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
32.51-30.04				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
30.04-27.57				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
27.57-25.10				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
25.10-22.64				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
22.64-20.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
20.00-17.45				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
17.45-14.98				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
14.98-12.51				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
12.51-10.04				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
10.04-7.57				1	1	1	1	1	1	1
T16 7.57-5.10	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T17 5.10-2.64	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] 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
				1	1	1	1	1	1	1
T18 2.64-0.00	Yes	Yes	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	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 80.00-60.00	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
T2 60.00-40.00	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
T3 40.00-37.45	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 37.45-34.98	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
T5 34.98-32.51	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 32.51-30.04	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 30.04-27.57	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 27.57-25.10	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
T9 25.10-22.64	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 22.64-20.00	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
T11 20.00-17.45	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 17.45-14.98	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
T13 14.98-12.51	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 12.51-10.04	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
T15 10.04-7.57	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
T16 7.57-5.10	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
T17 5.10-2.64	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
T18 2.64-0.00	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

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8" Power Cable	A	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.35	8	4	0.8750	0.8750		1.00
7/8" Power Cable	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.35	8	4	0.8750	0.8750		1.00
7/8" Power Cable	C	No	Ar (CaAa)	80.00 - 0.00	-1.0000	-0.35	12	4	0.8750	0.8750		1.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4" Rigid Conduit	A	No	Ar (CaAa)	80.00 - 0.00	-4.0000	0.38	6	3	1.2500	1.2500		0.70
2" Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.28	2	2	2.0000	2.0000		1.00
2" Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.26	4	4	2.0000	2.0000		1.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	90.00-80.00	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	0.000	0.000	0.00
T1	80.00-60.00	A	0.000	0.000	29.000	0.000	244.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.000	0.000	520.00
T2	60.00-40.00	A	0.000	0.000	29.000	0.000	244.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.000	0.000	520.00
T3	40.00-37.45	A	0.000	0.000	3.701	0.000	31.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.529	0.000	66.35
T4	37.45-34.98	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T5	34.98-32.51	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T6	32.51-30.04	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T7	30.04-27.57	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T8	27.57-25.10	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T9	25.10-22.64	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T10	22.64-20.00	A	0.000	0.000	3.821	0.000	32.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.774	0.000	68.52
T11	20.00-17.45	A	0.000	0.000	3.701	0.000	31.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.529	0.000	66.35
T12	17.45-14.98	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T13	14.98-12.51	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T14	12.51-10.04	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T15	10.04-7.57	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	7.283	0.000	64.19
T16	7.57-5.10	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T17	5.10-2.64	A	0.000	0.000	3.580	0.000	30.12
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.283	0.000	64.19
T18	2.64-0.00	A	0.000	0.000	3.821	0.000	32.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.774	0.000	68.52

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
L1	90.00-80.00	A	1.649	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	0.000	0.000	0.00
T1	80.00-60.00	A	1.617	0.000	0.000	57.051	0.000	1029.30
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	129.326	0.000	2190.03
T2	60.00-40.00	A	1.564	0.000	0.000	56.309	0.000	1006.14
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	127.884	0.000	2139.45
T3	40.00-37.45	A	1.524	0.000	0.000	7.115	0.000	126.23
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.183	0.000	268.29
T4	37.45-34.98	A	1.514	0.000	0.000	6.866	0.000	121.57
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.621	0.000	258.36
T5	34.98-32.51	A	1.503	0.000	0.000	6.847	0.000	121.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.585	0.000	257.14
T6	32.51-30.04	A	1.492	0.000	0.000	6.828	0.000	120.42
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.547	0.000	255.83
T7	30.04-27.57	A	1.480	0.000	0.000	6.807	0.000	119.78
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.507	0.000	254.44
T8	27.57-25.10	A	1.467	0.000	0.000	6.784	0.000	119.09
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.463	0.000	252.94
T9	25.10-22.64	A	1.452	0.000	0.000	6.760	0.000	118.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.415	0.000	251.31
T10	22.64-20.00	A	1.436	0.000	0.000	7.186	0.000	125.44
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.398	0.000	266.30
T11	20.00-17.45	A	1.417	0.000	0.000	6.926	0.000	120.49
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.816	0.000	255.72
T12	17.45-14.98	A	1.397	0.000	0.000	6.666	0.000	115.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.232	0.000	245.10
T13	14.98-12.51	A	1.374	0.000	0.000	6.626	0.000	114.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.157	0.000	242.54

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
T14	12.51-10.04	A	1.347	0.000	0.000	6.580	0.000	112.98
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.067	0.000	239.55
T15	10.04-7.57	A	1.314	0.000	0.000	6.524	0.000	111.33
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.958	0.000	235.92
T16	7.57-5.10	A	1.272	0.000	0.000	6.452	0.000	109.21
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.818	0.000	231.26
T17	5.10-2.64	A	1.211	0.000	0.000	6.347	0.000	106.20
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.615	0.000	224.63
T18	2.64-0.00	A	1.087	0.000	0.000	6.551	0.000	107.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.167	0.000	225.80

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	90.00-80.00	0.0000	0.0000	0.0000	0.0000
T1	80.00-60.00	0.1589	1.2704	0.1940	0.6590
T2	60.00-40.00	0.1709	1.3941	0.2207	0.7502
T3	40.00-37.45	0.1762	1.4669	0.2446	0.8319
T4	37.45-34.98	0.1779	1.4866	0.2459	0.8365
T5	34.98-32.51	0.1793	1.5051	0.2504	0.8519
T6	32.51-30.04	0.1808	1.5236	0.2550	0.8676
T7	30.04-27.57	0.1823	1.5420	0.2597	0.8838
T8	27.57-25.10	0.1837	1.5604	0.2645	0.9004
T9	25.10-22.64	0.1734	1.4780	0.2077	0.7072
T10	22.64-20.00	0.1711	1.4639	0.1737	0.5915
T11	20.00-17.45	0.1861	1.5985	0.2814	0.9582
T12	17.45-14.98	0.1877	1.6181	0.2842	0.9677
T13	14.98-12.51	0.1892	1.6360	0.2904	0.9892
T14	12.51-10.04	0.1906	1.6539	0.2973	1.0127
T15	10.04-7.57	0.1790	1.5587	0.2436	0.8298
T16	7.57-5.10	0.1802	1.5740	0.2535	0.8636
T17	5.10-2.64	0.1813	1.5892	0.2669	0.9093
T18	2.64-0.00	0.1785	1.5695	0.2599	0.8856

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	2	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	3	7/8" Power Cable	60.00 - 80.00	0.6000	0.3763
T1	4	1 1/4" Rigid Conduit	60.00 - 80.00	0.6000	0.3763
T1	5	2" Trunk	60.00 - 80.00	0.6000	0.3763
T1	6	2" Trunk	60.00 - 80.00	0.6000	0.3763

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	1	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	2	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	3	7/8" Power Cable	40.00 - 60.00	0.6000	0.3927
T2	4	1 1/4" Rigid Conduit	40.00 - 60.00	0.6000	0.3927
T2	5	2" Trunk	40.00 - 60.00	0.6000	0.3927
T2	6	2" Trunk	40.00 - 60.00	0.6000	0.3927
T3	1	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	2	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	3	7/8" Power Cable	37.45 - 40.00	0.6000	0.4316
T3	4	1 1/4" Rigid Conduit	37.45 - 40.00	0.6000	0.4316
T3	5	2" Trunk	37.45 - 40.00	0.6000	0.4316
T3	6	2" Trunk	37.45 - 40.00	0.6000	0.4316
T4	1	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	2	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	3	7/8" Power Cable	34.98 - 37.45	0.6000	0.4282
T4	4	1 1/4" Rigid Conduit	34.98 - 37.45	0.6000	0.4282
T4	5	2" Trunk	34.98 - 37.45	0.6000	0.4282
T4	6	2" Trunk	34.98 - 37.45	0.6000	0.4282
T5	1	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	2	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	3	7/8" Power Cable	32.51 - 34.98	0.6000	0.4337
T5	4	1 1/4" Rigid Conduit	32.51 - 34.98	0.6000	0.4337
T5	5	2" Trunk	32.51 - 34.98	0.6000	0.4337
T5	6	2" Trunk	32.51 - 34.98	0.6000	0.4337
T6	1	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	2	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	3	7/8" Power Cable	30.04 - 32.51	0.6000	0.4392
T6	4	1 1/4" Rigid Conduit	30.04 - 32.51	0.6000	0.4392
T6	5	2" Trunk	30.04 - 32.51	0.6000	0.4392
T6	6	2" Trunk	30.04 - 32.51	0.6000	0.4392
T7	1	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	2	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	3	7/8" Power Cable	27.57 - 30.04	0.6000	0.4449
T7	4	1 1/4" Rigid Conduit	27.57 - 30.04	0.6000	0.4449
T7	5	2" Trunk	27.57 - 30.04	0.6000	0.4449
T7	6	2" Trunk	27.57 - 30.04	0.6000	0.4449
T8	1	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	2	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	3	7/8" Power Cable	25.10 - 27.57	0.6000	0.4507
T8	4	1 1/4" Rigid Conduit	25.10 - 27.57	0.6000	0.4507
T8	5	2" Trunk	25.10 - 27.57	0.6000	0.4507
T8	6	2" Trunk	25.10 - 27.57	0.6000	0.4507
T9	1	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	2	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	3	7/8" Power Cable	22.64 - 25.10	0.6000	0.3123
T9	4	1 1/4" Rigid Conduit	22.64 - 25.10	0.6000	0.3123
T9	5	2" Trunk	22.64 - 25.10	0.6000	0.3123
T9	6	2" Trunk	22.64 - 25.10	0.6000	0.3123
T10	1	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	2	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	3	7/8" Power Cable	20.00 - 22.64	0.6000	0.2437
T10	4	1 1/4" Rigid Conduit	20.00 - 22.64	0.6000	0.2437
T10	5	2" Trunk	20.00 - 22.64	0.6000	0.2437
T10	6	2" Trunk	20.00 - 22.64	0.6000	0.2437
T11	1	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	2	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	3	7/8" Power Cable	17.45 - 20.00	0.6000	0.4735
T11	4	1 1/4" Rigid Conduit	17.45 - 20.00	0.6000	0.4735
T11	5	2" Trunk	17.45 - 20.00	0.6000	0.4735
T11	6	2" Trunk	17.45 - 20.00	0.6000	0.4735
T12	1	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727
T12	2	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	3	7/8" Power Cable	14.98 - 17.45	0.6000	0.4727
T12	4	1 1/4" Rigid Conduit	14.98 - 17.45	0.6000	0.4727
T12	5	2" Trunk	14.98 - 17.45	0.6000	0.4727
T12	6	2" Trunk	14.98 - 17.45	0.6000	0.4727
T13	1	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	2	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	3	7/8" Power Cable	12.51 - 14.98	0.6000	0.4804
T13	4	1 1/4" Rigid Conduit	12.51 - 14.98	0.6000	0.4804
T13	5	2" Trunk	12.51 - 14.98	0.6000	0.4804
T13	6	2" Trunk	12.51 - 14.98	0.6000	0.4804
T14	1	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	2	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	3	7/8" Power Cable	10.04 - 12.51	0.6000	0.4890
T14	4	1 1/4" Rigid Conduit	10.04 - 12.51	0.6000	0.4890
T14	5	2" Trunk	10.04 - 12.51	0.6000	0.4890
T14	6	2" Trunk	10.04 - 12.51	0.6000	0.4890
T15	1	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	2	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	3	7/8" Power Cable	7.57 - 10.04	0.6000	0.3619
T15	4	1 1/4" Rigid Conduit	7.57 - 10.04	0.6000	0.3619
T15	5	2" Trunk	7.57 - 10.04	0.6000	0.3619
T15	6	2" Trunk	7.57 - 10.04	0.6000	0.3619
T16	1	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	2	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	3	7/8" Power Cable	5.10 - 7.57	0.6000	0.3762
T16	4	1 1/4" Rigid Conduit	5.10 - 7.57	0.6000	0.3762
T16	5	2" Trunk	5.10 - 7.57	0.6000	0.3762
T16	6	2" Trunk	5.10 - 7.57	0.6000	0.3762
T17	1	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	2	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	3	7/8" Power Cable	2.64 - 5.10	0.6000	0.3960
T17	4	1 1/4" Rigid Conduit	2.64 - 5.10	0.6000	0.3960
T17	5	2" Trunk	2.64 - 5.10	0.6000	0.3960
T17	6	2" Trunk	2.64 - 5.10	0.6000	0.3960
T18	1	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	2	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	3	7/8" Power Cable	0.00 - 2.64	0.6000	0.3714
T18	4	1 1/4" Rigid Conduit	0.00 - 2.64	0.6000	0.3714
T18	5	2" Trunk	0.00 - 2.64	0.6000	0.3714
T18	6	2" Trunk	0.00 - 2.64	0.6000	0.3714

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
20' 8 Bay Di-Pole	C	From Leg	0.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	4.00 6.00 8.00	4.00 6.00 8.00	55.00 100.00 145.00
10' Omni	C	From Leg	2.00 5.00	0.0000	85.00	No Ice 1/2" Ice	2.00 3.02	2.00 3.02	30.00 45.50

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	4.07	4.07	67.47
7' Whip	B	From Leg	2.00	0.0000	83.00	No Ice	1.74	1.74	37.30
			-5.00			1/2" Ice	2.60	2.60	53.68
			0.00			1" Ice	3.29	3.29	75.57
7770	A	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770	B	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770	C	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	35.00
			-5.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
CCI OPA-65R-LCUU-H6	A	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6	B	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
CCI OPA-65R-LCUU-H6	C	From Leg	2.00	0.0000	78.00	No Ice	9.72	7.15	101.05
Panel Antenna with 8ft Pipe			0.00			1/2" Ice	10.29	8.33	176.87
(at&t)			0.00			1" Ice	10.83	9.23	260.86
800-10965	A	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
800-10965	B	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
800-10965	C	From Leg	2.00	0.0000	78.00	No Ice	14.16	7.73	137.80
(at&t)			0.00			1/2" Ice	14.84	9.05	235.43
			0.00			1" Ice	15.50	10.22	342.19
QS66512-2	A	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
QS66512-2	B	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
QS66512-2	C	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	111.00
(at&t)			-5.00			1/2" Ice	8.59	7.27	168.20
			0.00			1" Ice	9.05	7.72	231.66
TMA	A	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
TMA	B	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
TMA	C	From Leg	2.00	0.0000	78.00	No Ice	1.00	0.41	20.00
(at&t)			0.00			1/2" Ice	1.13	0.50	27.62
			0.00			1" Ice	1.26	0.59	37.11
RRUS 32	A	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	B	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32	C	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90

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	3.17	2.05	98.09
RRU B14 4478	A	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	B	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	C	From Leg	2.00	0.0000	78.00	No Ice	1.86	0.82	47.40
(at&t)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRUS 4478 B5	A	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	B	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4478 B5	C	From Leg	2.00	0.0000	78.00	No Ice	1.84	1.06	59.90
(at&t)			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS 4426 B66	A	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	B	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS 4426 B66	C	From Leg	2.00	0.0000	78.00	No Ice	1.65	0.68	46.00
(at&t)			0.00			1/2" Ice	1.81	0.79	58.47
			0.00			1" Ice	1.98	0.92	73.32
RRUS11 B12 (Partiall	A	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS11 B12 (Partiall	B	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS11 B12 (Partiall	C	From Leg	2.00	0.0000	78.00	No Ice	0.88	1.18	50.70
Shielded by 11.9" Antenna)			0.00			1/2" Ice	1.02	1.33	60.68
(at&t)			0.00			1" Ice	1.16	1.48	72.93
RRUS 32 B2	A	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	B	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
RRUS 32 B2	C	From Leg	2.00	0.0000	78.00	No Ice	2.72	1.67	52.90
(at&t)			0.00			1/2" Ice	2.94	1.86	73.90
			0.00			1" Ice	3.17	2.05	98.09
DC6-48-60-18-8C	A	From Face	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	B	From Leg	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
DC6-48-60-18-8C	C	From Leg	1.00	0.0000	78.00	No Ice	0.55	0.55	26.20
(at&t)			0.00			1/2" Ice	0.90	0.90	37.21
			0.00			1" Ice	1.04	1.04	50.18
Pirod 12' PCS T-Frame (1)	A	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(at&t)			0.00			1" Ice	19.80	19.80	460.00
Pirod 12' PCS T-Frame (1)	B	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00
(at&t)			0.00			1" Ice	19.80	19.80	460.00
Pirod 12' PCS T-Frame (1)	C	From Leg	0.00	0.0000	78.00	No Ice	9.80	9.80	260.00
104569			0.00			1/2" Ice	14.80	14.80	360.00
(at&t)			0.00			1" Ice	19.80	19.80	460.00
7' Whip	B	From Leg	0.00	0.0000	65.00	No Ice	1.74	1.74	37.30
			0.00			1/2" Ice	2.60	2.60	53.68
			6.00			1" Ice	3.29	3.29	75.57
10' Omni	C	From Leg	4.00	0.0000	65.00	No Ice	2.00	2.00	30.00
			6.00			1/2" Ice	3.02	3.02	45.50
			0.00			1" Ice	4.07	4.07	67.47
1.5" Dia 4' Omni w/Pipe Mount	C	From Leg	6.00	0.0000	65.00	No Ice	0.94	0.94	22.30
			0.00			1/2" Ice	1.39	1.39	32.81
			-3.00			1" Ice	1.78	1.78	46.94
4 ' Side Arm	C	From Leg	2.00	0.0000	55.00	No Ice	2.60	2.60	72.00
			0.00			1/2" Ice	3.01	3.01	93.13
			0.00			1" Ice	3.42	3.42	114.26
4 ' Side Arm	B	From Leg	2.00	0.0000	55.00	No Ice	2.60	2.60	72.00
			0.00			1/2" Ice	3.01	3.01	93.13
			0.00			1" Ice	3.42	3.42	114.26
10' Omni	B	From Leg	3.00	0.0000	55.00	No Ice	2.00	2.00	30.00
			0.00			1/2" Ice	3.02	3.02	45.50
			5.00			1" Ice	4.07	4.07	67.47
10' Yagi	C	From Leg	3.00	0.0000	55.00	No Ice	4.00	4.00	120.00
			0.00			1/2" Ice	8.70	8.70	220.00
			0.00			1" Ice	13.40	13.40	320.00
6' Side Arm	C	From Leg	3.00	0.0000	65.00	No Ice	8.70	8.70	160.00
			0.00			1/2" Ice	9.40	9.40	215.00
			0.00			1" Ice	10.10	10.10	270.00
6' Side Arm	B	From Leg	3.00	0.0000	65.00	No Ice	8.70	8.70	160.00
			0.00			1/2" Ice	9.40	9.40	215.00
			0.00			1" Ice	10.10	10.10	270.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
2' dish	B	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	2.00	No Ice	3.14	15.00
				0.00					1/2" Ice	3.41	47.50
				0.00					1" Ice	3.68	65.01
4' dish	A	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	4.00	No Ice	12.57	80.00
				0.00					1/2" Ice	13.10	80.00
				0.00					1" Ice	13.62	80.00

Tower Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	25	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	24	72.500	A	0.984	10.818	5.000	42.37	29.000	0.000
					B	0.984	10.818		42.37	0.000	0.000
					C	0.984	10.818		42.37	59.000	0.000
T2 60.00-40.00	50.00	1.094	22	78.334	A	0.000	14.023	6.667	47.55	29.000	0.000
					B	0.000	14.023		47.55	0.000	0.000
					C	0.000	14.023		47.55	59.000	0.000
T3 40.00-37.45	38.72	1.036	21	10.767	A	0.000	1.932	0.957	49.53	3.701	0.000
					B	0.000	1.932		49.53	0.000	0.000
					C	0.000	1.932		49.53	7.529	0.000
T4 37.45-34.98	36.21	1.022	21	10.569	A	0.000	1.874	0.926	49.42	3.580	0.000
					B	0.000	1.874		49.42	0.000	0.000
					C	0.000	1.874		49.42	7.283	0.000
T5 34.98-32.51	33.74	1.007	21	10.724	A	0.000	1.886	0.926	49.09	3.580	0.000
					B	0.000	1.886		49.09	0.000	0.000
					C	0.000	1.886		49.09	7.283	0.000
T6 32.51-30.04	31.28	0.991	20	10.878	A	0.000	1.899	0.926	48.76	3.580	0.000
					B	0.000	1.899		48.76	0.000	0.000
					C	0.000	1.899		48.76	7.283	0.000
T7 30.04-27.57	28.81	0.974	20	11.032	A	0.000	1.911	0.926	48.44	3.580	0.000
					B	0.000	1.911		48.44	0.000	0.000
					C	0.000	1.911		48.44	7.283	0.000
T8 27.57-25.10	26.34	0.956	20	11.187	A	0.000	1.924	0.926	48.13	3.580	0.000
					B	0.000	1.924		48.13	0.000	0.000
					C	0.000	1.924		48.13	7.283	0.000
T9 25.10-22.64	23.87	0.936	19	11.341	A	0.703	1.936	0.926	35.08	3.580	0.000
					B	0.703	1.936		35.08	0.000	0.000
					C	0.703	1.936		35.08	7.283	0.000
T10 22.64-20.00	21.32	0.914	19	12.271	A	0.713	2.370	0.988	32.05	3.821	0.000
					B	0.713	2.370		32.05	0.000	0.000
					C	0.713	2.370		32.05	7.774	0.000
T11 20.00-17.45	18.72	0.889	18	12.096	A	0.000	2.139	1.063	49.71	3.701	0.000
					B	0.000	2.139		49.71	0.000	0.000
					C	0.000	2.139		49.71	7.529	0.000
T12 17.45-14.98	16.21	0.863	18	11.855	A	0.000	2.072	1.029	49.64	3.580	0.000
					B	0.000	2.072		49.64	0.000	0.000
					C	0.000	2.072		49.64	7.283	0.000
T13 14.98-12.51	13.74	0.85	17	12.009	A	0.000	2.085	1.029	49.34	3.580	0.000
					B	0.000	2.085		49.34	0.000	0.000
					C	0.000	2.085		49.34	7.283	0.000
T14 12.51-10.04	11.28	0.85	17	12.164	A	0.000	2.098	1.029	49.04	3.580	0.000
					B	0.000	2.098		49.04	0.000	0.000
					C	0.000	2.098		49.04	7.283	0.000
T15 10.04-7.57	8.81	0.85	17	12.318	A	0.762	2.110	1.029	35.81	3.580	0.000
					B	0.762	2.110		35.81	0.000	0.000
					C	0.762	2.110		35.81	7.283	0.000
T16 7.57-5.10	6.34	0.85	17	12.472	A	0.773	2.123	1.029	35.53	3.580	0.000
					B	0.773	2.123		35.53	0.000	0.000
					C	0.773	2.123		35.53	7.283	0.000
T17 5.10-2.64	3.87	0.85	17	12.627	A	0.783	2.136	1.029	35.24	3.580	0.000
					B	0.783	2.136		35.24	0.000	0.000
					C	0.783	2.136		35.24	7.283	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T18 2.64-0.00	1.32	0.85	17	13.644	A	0.793	2.617	1.098	32.21	3.821	0.000
					B	0.793	2.617		32.21	0.000	0.000
					C	0.793	2.617		32.21	7.774	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	7	1.6489	6.498	A	0.000	6.498	6.498	100.00	0.000	0.000
						B	0.000	6.498		100.00	0.000	0.000
						C	0.000	6.498		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	6	1.6171	77.890	A	0.984	47.596	15.781	32.48	57.051	0.000
						B	0.984	47.596		32.48	0.000	0.000
						C	0.984	47.596		32.48	129.326	0.000
T2 60.00-40.00	50.00	1.094	6	1.5636	83.546	A	0.000	50.738	17.093	33.69	56.309	0.000
						B	0.000	50.738		33.69	0.000	0.000
						C	0.000	50.738		33.69	127.884	0.000
T3 40.00-37.45	38.72	1.036	6	1.5242	11.415	A	0.000	6.489	2.254	34.74	7.115	0.000
						B	0.000	6.489		34.74	0.000	0.000
						C	0.000	6.489		34.74	16.183	0.000
T4 37.45-34.98	36.21	1.022	6	1.5140	11.192	A	0.000	6.400	2.172	33.94	6.866	0.000
						B	0.000	6.400		33.94	0.000	0.000
						C	0.000	6.400		33.94	15.621	0.000
T5 34.98-32.51	33.74	1.007	5	1.5034	11.342	A	0.000	6.423	2.163	33.68	6.847	0.000
						B	0.000	6.423		33.68	0.000	0.000
						C	0.000	6.423		33.68	15.585	0.000
T6 32.51-30.04	31.28	0.991	5	1.4920	11.492	A	0.000	6.444	2.154	33.42	6.828	0.000
						B	0.000	6.444		33.42	0.000	0.000
						C	0.000	6.444		33.42	15.547	0.000
T7 30.04-27.57	28.81	0.974	5	1.4798	11.641	A	0.000	6.462	2.144	33.17	6.807	0.000
						B	0.000	6.462		33.17	0.000	0.000
						C	0.000	6.462		33.17	15.507	0.000
T8 27.57-25.10	26.34	0.956	5	1.4666	11.790	A	0.000	6.476	2.133	32.93	6.784	0.000
						B	0.000	6.476		32.93	0.000	0.000
						C	0.000	6.476		32.93	15.463	0.000
T9 25.10-22.64	23.87	0.936	5	1.4522	11.938	A	0.703	7.507	2.121	25.83	6.760	0.000
						B	0.703	7.507		25.83	0.000	0.000
						C	0.703	7.507		25.83	15.415	0.000
T10 22.64-20.00	21.32	0.914	5	1.4359	12.902	A	0.713	9.044	2.250	23.06	7.186	0.000
						B	0.713	9.044		23.06	0.000	0.000
						C	0.713	9.044		23.06	16.398	0.000
T11 20.00-17.45	18.72	0.889	5	1.4174	12.699	A	0.000	6.686	2.269	33.94	6.926	0.000
						B	0.000	6.686		33.94	0.000	0.000
						C	0.000	6.686		33.94	15.816	0.000
T12 17.45-14.98	16.21	0.863	5	1.3971	12.430	A	0.000	6.555	2.179	33.24	6.666	0.000
						B	0.000	6.555		33.24	0.000	0.000
						C	0.000	6.555		33.24	15.232	0.000
T13 14.98-12.51	13.74	0.85	5	1.3742	12.575	A	0.000	6.534	2.160	33.06	6.626	0.000
						B	0.000	6.534		33.06	0.000	0.000
						C	0.000	6.534		33.06	15.157	0.000
T14 12.51-10.04	11.28	0.85	5	1.3473	12.718	A	0.000	6.498	2.138	32.89	6.580	0.000
						B	0.000	6.498		32.89	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	6.498		32.89	15.067	0.000
T15 10.04-7.57	8.81	0.85	5	1.3144	12.859	A	0.762	7.444	2.111	25.72	6.524	0.000
						B	0.762	7.444		25.72	0.000	0.000
						C	0.762	7.444		25.72	14.958	0.000
T16 7.57-5.10	6.34	0.85	5	1.2719	12.996	A	0.773	7.334	2.076	25.60	6.452	0.000
						B	0.773	7.334		25.60	0.000	0.000
						C	0.773	7.334		25.60	14.818	0.000
T17 5.10-2.64	3.87	0.85	5	1.2106	13.125	A	0.783	7.144	2.025	25.55	6.347	0.000
						B	0.783	7.144		25.55	0.000	0.000
						C	0.783	7.144		25.55	14.615	0.000
T18 2.64-0.00	1.32	0.85	5	1.0870	14.121	A	0.793	8.083	2.053	23.13	6.551	0.000
						B	0.793	8.083		23.13	0.000	0.000
						C	0.793	8.083		23.13	15.167	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 90.00-80.00	85.00	1.223	10	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	9	72.500	A	0.984	10.818	5.000	42.37	29.000	0.000
					B	0.984	10.818		42.37	0.000	0.000
					C	0.984	10.818		42.37	59.000	0.000
T2 60.00-40.00	50.00	1.094	9	78.334	A	0.000	14.023	6.667	47.55	29.000	0.000
					B	0.000	14.023		47.55	0.000	0.000
					C	0.000	14.023		47.55	59.000	0.000
T3 40.00-37.45	38.72	1.036	8	10.767	A	0.000	1.932	0.957	49.53	3.701	0.000
					B	0.000	1.932		49.53	0.000	0.000
					C	0.000	1.932		49.53	7.529	0.000
T4 37.45-34.98	36.21	1.022	8	10.569	A	0.000	1.874	0.926	49.42	3.580	0.000
					B	0.000	1.874		49.42	0.000	0.000
					C	0.000	1.874		49.42	7.283	0.000
T5 34.98-32.51	33.74	1.007	8	10.724	A	0.000	1.886	0.926	49.09	3.580	0.000
					B	0.000	1.886		49.09	0.000	0.000
					C	0.000	1.886		49.09	7.283	0.000
T6 32.51-30.04	31.28	0.991	8	10.878	A	0.000	1.899	0.926	48.76	3.580	0.000
					B	0.000	1.899		48.76	0.000	0.000
					C	0.000	1.899		48.76	7.283	0.000
T7 30.04-27.57	28.81	0.974	8	11.032	A	0.000	1.911	0.926	48.44	3.580	0.000
					B	0.000	1.911		48.44	0.000	0.000
					C	0.000	1.911		48.44	7.283	0.000
T8 27.57-25.10	26.34	0.956	7	11.187	A	0.000	1.924	0.926	48.13	3.580	0.000
					B	0.000	1.924		48.13	0.000	0.000
					C	0.000	1.924		48.13	7.283	0.000
T9 25.10-22.64	23.87	0.936	7	11.341	A	0.703	1.936	0.926	35.08	3.580	0.000
					B	0.703	1.936		35.08	0.000	0.000
					C	0.703	1.936		35.08	7.283	0.000
T10 22.64-20.00	21.32	0.914	7	12.271	A	0.713	2.370	0.988	32.05	3.821	0.000
					B	0.713	2.370		32.05	0.000	0.000
					C	0.713	2.370		32.05	7.774	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T11	18.72	0.889	7	12.096	A	0.000	2.139	1.063	49.71	3.701	0.000
20.00-17.45					B	0.000	2.139		49.71	0.000	0.000
					C	0.000	2.139		49.71	7.529	0.000
T12	16.21	0.863	7	11.855	A	0.000	2.072	1.029	49.64	3.580	0.000
17.45-14.98					B	0.000	2.072		49.64	0.000	0.000
					C	0.000	2.072		49.64	7.283	0.000
T13	13.74	0.85	7	12.009	A	0.000	2.085	1.029	49.34	3.580	0.000
14.98-12.51					B	0.000	2.085		49.34	0.000	0.000
					C	0.000	2.085		49.34	7.283	0.000
T14	11.28	0.85	7	12.164	A	0.000	2.098	1.029	49.04	3.580	0.000
12.51-10.04					B	0.000	2.098		49.04	0.000	0.000
					C	0.000	2.098		49.04	7.283	0.000
T15 10.04-7.57	8.81	0.85	7	12.318	A	0.762	2.110	1.029	35.81	3.580	0.000
					B	0.762	2.110		35.81	0.000	0.000
					C	0.762	2.110		35.81	7.283	0.000
T16 7.57-5.10	6.34	0.85	7	12.472	A	0.773	2.123	1.029	35.53	3.580	0.000
					B	0.773	2.123		35.53	0.000	0.000
					C	0.773	2.123		35.53	7.283	0.000
T17 5.10-2.64	3.87	0.85	7	12.627	A	0.783	2.136	1.029	35.24	3.580	0.000
					B	0.783	2.136		35.24	0.000	0.000
					C	0.783	2.136		35.24	7.283	0.000
T18 2.64-0.00	1.32	0.85	7	13.644	A	0.793	2.617	1.098	32.21	3.821	0.000
					B	0.793	2.617		32.21	0.000	0.000
					C	0.793	2.617		32.21	7.774	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	1	1	7.139	1551.09	77.55	C
80.00-60.00			B	0.163	2.725		1	1	7.139			
			C	0.163	2.725		1	1	7.139			
T2	764.00	1354.01	A	0.179	2.668	22	1	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		1	1	8.009			
			C	0.179	2.668		1	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	1	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		1	1	1.104			
			C	0.179	2.666		1	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	1	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		1	1	1.070			
			C	0.177	2.674		1	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	1	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		1	1	1.076			
			C	0.176	2.679		1	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	1	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		1	1	1.083			
			C	0.175	2.683		1	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	1	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		1	1	1.090			
			C	0.173	2.688		1	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	1	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		1	1	1.097			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.172	2.692		1	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	1	1	1.828	180.34	73.05	C
25.10-22.64			B	0.233	2.49		1	1	1.828			
			C	0.233	2.49		1	1	1.828			
T10	100.67	289.48	A	0.251	2.434	19	1	1	2.101	192.00	72.85	C
22.64-20.00			B	0.251	2.434		1	1	2.101			
			C	0.251	2.434		1	1	2.101			
T11	97.49	238.72	A	0.177	2.675	18	1	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		1	1	1.221			
			C	0.177	2.675		1	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	1	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		1	1	1.182			
			C	0.175	2.682		1	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	1	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		1	1	1.189			
			C	0.174	2.687		1	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	1	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		1	1	1.196			
			C	0.172	2.691		1	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	1	1	1.988	169.62	68.71	C
10.04-7.57			B	0.233	2.489		1	1	1.988			
			C	0.233	2.489		1	1	1.988			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	1	1	2.006	170.35	69.00	C
			B	0.232	2.492		1	1	2.006			
			C	0.232	2.492		1	1	2.006			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	1	1	2.023	171.09	69.30	C
			B	0.231	2.495		1	1	2.023			
			C	0.231	2.495		1	1	2.023			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	1	1	2.324	186.72	70.85	C
			B	0.25	2.438		1	1	2.324			
			C	0.25	2.438		1	1	2.324			
Sum Weight:	3056.00	6301.87						OTM	242.41 kip-ft	5728.43		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	0.8	1	6.942	1540.13	77.01	C
80.00-60.00			B	0.163	2.725		0.8	1	6.942			
			C	0.163	2.725		0.8	1	6.942			
T2	764.00	1354.01	A	0.179	2.668	22	0.8	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		0.8	1	8.009			
			C	0.179	2.668		0.8	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	0.8	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		0.8	1	1.104			
			C	0.179	2.666		0.8	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	0.8	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		0.8	1	1.070			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.177	2.674		0.8	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	0.8	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		0.8	1	1.076			
			C	0.176	2.679		0.8	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	0.8	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		0.8	1	1.083			
			C	0.175	2.683		0.8	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	0.8	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		0.8	1	1.090			
			C	0.173	2.688		0.8	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	0.8	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		0.8	1	1.097			
			C	0.172	2.692		0.8	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	0.8	1	1.687	174.64	70.74	C
25.10-22.64			B	0.233	2.49		0.8	1	1.687			
			C	0.233	2.49		0.8	1	1.687			
T10	100.67	289.48	A	0.251	2.434	19	0.8	1	1.958	186.48	70.76	C
22.64-20.00			B	0.251	2.434		0.8	1	1.958			
			C	0.251	2.434		0.8	1	1.958			
T11	97.49	238.72	A	0.177	2.675	18	0.8	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		0.8	1	1.221			
			C	0.177	2.675		0.8	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	0.8	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		0.8	1	1.182			
			C	0.175	2.682		0.8	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	0.8	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		0.8	1	1.189			
			C	0.174	2.687		0.8	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	0.8	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		0.8	1	1.196			
			C	0.172	2.691		0.8	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	0.8	1	1.836	164.01	66.43	C
10.04-7.57			B	0.233	2.489		0.8	1	1.836			
			C	0.233	2.489		0.8	1	1.836			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	0.8	1	1.851	164.66	66.70	C
			B	0.232	2.492		0.8	1	1.851			
			C	0.232	2.492		0.8	1	1.851			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	0.8	1	1.867	165.31	66.96	C
			B	0.231	2.495		0.8	1	1.867			
			C	0.231	2.495		0.8	1	1.867			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	0.8	1	2.165	181.00	68.68	C
			B	0.25	2.438		0.8	1	2.165			
			C	0.25	2.438		0.8	1	2.165			
Sum Weight:	3056.00	6301.87						OTM	241.27 kip-ft	5683.43		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	0.956	25	1	1	3.750	121.23	12.12	C
90.00-80.00			B	1	0.956		1	1	3.750			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	1	0.956		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	24	0.85	1	6.992	1542.87	77.14	C
80.00-60.00			B	0.163	2.725		0.85	1	6.992			
			C	0.163	2.725		0.85	1	6.992			
T2	764.00	1354.01	A	0.179	2.668	22	0.85	1	8.009	1411.71	70.59	C
60.00-40.00			B	0.179	2.668		0.85	1	8.009			
			C	0.179	2.668		0.85	1	8.009			
T3	97.49	203.42	A	0.179	2.666	21	0.85	1	1.104	174.61	68.42	C
40.00-37.45			B	0.179	2.666		0.85	1	1.104			
			C	0.179	2.666		0.85	1	1.104			
T4	94.31	193.04	A	0.177	2.674	21	0.85	1	1.070	166.78	67.55	C
37.45-34.98			B	0.177	2.674		0.85	1	1.070			
			C	0.177	2.674		0.85	1	1.070			
T5	94.31	194.13	A	0.176	2.679	21	0.85	1	1.076	164.72	66.72	C
34.98-32.51			B	0.176	2.679		0.85	1	1.076			
			C	0.176	2.679		0.85	1	1.076			
T6	94.31	195.23	A	0.175	2.683	20	0.85	1	1.083	162.51	65.83	C
32.51-30.04			B	0.175	2.683		0.85	1	1.083			
			C	0.175	2.683		0.85	1	1.083			
T7	94.31	196.33	A	0.173	2.688	20	0.85	1	1.090	160.12	64.86	C
30.04-27.57			B	0.173	2.688		0.85	1	1.090			
			C	0.173	2.688		0.85	1	1.090			
T8	94.31	197.43	A	0.172	2.692	20	0.85	1	1.097	157.51	63.80	C
27.57-25.10			B	0.172	2.692		0.85	1	1.097			
			C	0.172	2.692		0.85	1	1.097			
T9	94.31	242.83	A	0.233	2.49	19	0.85	1	1.723	176.06	71.32	C
25.10-22.64			B	0.233	2.49		0.85	1	1.723			
			C	0.233	2.49		0.85	1	1.723			
T10	100.67	289.48	A	0.251	2.434	19	0.85	1	1.994	187.86	71.28	C
22.64-20.00			B	0.251	2.434		0.85	1	1.994			
			C	0.251	2.434		0.85	1	1.994			
T11	97.49	238.72	A	0.177	2.675	18	0.85	1	1.221	154.86	60.68	C
20.00-17.45			B	0.177	2.675		0.85	1	1.221			
			C	0.177	2.675		0.85	1	1.221			
T12	94.31	226.54	A	0.175	2.682	18	0.85	1	1.182	145.50	58.94	C
17.45-14.98			B	0.175	2.682		0.85	1	1.182			
			C	0.175	2.682		0.85	1	1.182			
T13	94.31	227.66	A	0.174	2.687	17	0.85	1	1.189	143.67	58.19	C
14.98-12.51			B	0.174	2.687		0.85	1	1.189			
			C	0.174	2.687		0.85	1	1.189			
T14	94.31	228.77	A	0.172	2.691	17	0.85	1	1.196	144.02	58.34	C
12.51-10.04			B	0.172	2.691		0.85	1	1.196			
			C	0.172	2.691		0.85	1	1.196			
T15	94.31	277.96	A	0.233	2.489	17	0.85	1	1.874	165.41	67.00	C
10.04-7.57			B	0.233	2.489		0.85	1	1.874			
			C	0.233	2.489		0.85	1	1.874			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	17	0.85	1	1.890	166.08	67.27	C
			B	0.232	2.492		0.85	1	1.890			
			C	0.232	2.492		0.85	1	1.890			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	17	0.85	1	1.906	166.75	67.54	C
			B	0.231	2.495		0.85	1	1.906			
			C	0.231	2.495		0.85	1	1.906			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	17	0.85	1	2.205	182.43	69.22	C
			B	0.25	2.438		0.85	1	2.205			
			C	0.25	2.438		0.85	1	2.205			
Sum Weight:	3056.00	6301.87						OTM	241.55 kip-ft	5694.68		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	1	1	37.110	775.76	38.79	C
80.00-60.00			B	0.624	1.791		1	1	37.110			
			C	0.624	1.791		1	1	37.110			
T2	3145.59	3238.01	A	0.607	1.8	6	1	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		1	1	37.973			
			C	0.607	1.8		1	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	1	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		1	1	4.699			
			C	0.568	1.827		1	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	1	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		1	1	4.648			
			C	0.572	1.824		1	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	1	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		1	1	4.644			
			C	0.566	1.829		1	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	1	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		1	1	4.637			
			C	0.561	1.834		1	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	1	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		1	1	4.628			
			C	0.555	1.839		1	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	1	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		1	1	4.616			
			C	0.549	1.844		1	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	1	1	6.727	81.68	33.09	C
25.10-22.64			B	0.688	1.776		1	1	6.727			
			C	0.688	1.776		1	1	6.727			
T10	391.74	676.58	A	0.756	1.79	5	1	1	8.421	88.01	33.39	C
22.64-20.00			B	0.756	1.79		1	1	8.421			
			C	0.756	1.79		1	1	8.421			
T11	376.21	470.12	A	0.526	1.868	5	1	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		1	1	4.678			
			C	0.526	1.868		1	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	1	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		1	1	4.589			
			C	0.527	1.867		1	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	1	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		1	1	4.546			
			C	0.52	1.876		1	1	4.546			
T14	352.53	444.00	A	0.511	1.886	5	1	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		1	1	4.490			
			C	0.511	1.886		1	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	1	1	6.483	76.04	30.80	C
10.04-7.57			B	0.638	1.785		1	1	6.483			
			C	0.638	1.785		1	1	6.483			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	1	1	6.340	76.08	30.82	C
			B	0.624	1.791		1	1	6.340			
			C	0.624	1.791		1	1	6.340			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	1	1	6.114	75.93	30.75	C
			B	0.604	1.802		1	1	6.114			
			C	0.604	1.802		1	1	6.114			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	1	1	6.954	80.60	30.58	C
			B	0.629	1.789		1	1	6.954			
			C	0.629	1.789		1	1	6.954			
Sum Weight:	12199.02	14443.23						OTM	122.40 kip-ft	2849.54		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	0.8	1	36.913	773.85	38.69	C
80.00-60.00			B	0.624	1.791		0.8	1	36.913			
			C	0.624	1.791		0.8	1	36.913			
T2	3145.59	3238.01	A	0.607	1.8	6	0.8	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		0.8	1	37.973			
			C	0.607	1.8		0.8	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	0.8	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		0.8	1	4.699			
			C	0.568	1.827		0.8	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	0.8	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		0.8	1	4.648			
			C	0.572	1.824		0.8	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	0.8	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		0.8	1	4.644			
			C	0.566	1.829		0.8	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	0.8	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		0.8	1	4.637			
			C	0.561	1.834		0.8	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	0.8	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		0.8	1	4.628			
			C	0.555	1.839		0.8	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	0.8	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		0.8	1	4.616			
			C	0.549	1.844		0.8	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	0.8	1	6.586	80.60	32.65	C
25.10-22.64			B	0.688	1.776		0.8	1	6.586			
			C	0.688	1.776		0.8	1	6.586			
T10	391.74	676.58	A	0.756	1.79	5	0.8	1	8.278	86.93	32.99	C
22.64-20.00			B	0.756	1.79		0.8	1	8.278			
			C	0.756	1.79		0.8	1	8.278			
T11	376.21	470.12	A	0.526	1.868	5	0.8	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		0.8	1	4.678			
			C	0.526	1.868		0.8	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	0.8	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		0.8	1	4.589			
			C	0.527	1.867		0.8	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	0.8	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		0.8	1	4.546			
			C	0.52	1.876		0.8	1	4.546			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T14	352.53	444.00	A	0.511	1.886	5	0.8	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		0.8	1	4.490			
			C	0.511	1.886		0.8	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	0.8	1	6.330	74.97	30.37	C
10.04-7.57			B	0.638	1.785		0.8	1	6.330			
			C	0.638	1.785		0.8	1	6.330			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	0.8	1	6.185	74.99	30.38	C
			B	0.624	1.791		0.8	1	6.185			
			C	0.624	1.791		0.8	1	6.185			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	0.8	1	5.958	74.82	30.31	C
			B	0.604	1.802		0.8	1	5.958			
			C	0.604	1.802		0.8	1	5.958			
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	0.8	1	6.796	79.49	30.16	C
			B	0.629	1.789		0.8	1	6.796			
			C	0.629	1.789		0.8	1	6.796			
Sum Weight:	12199.02	14443.23						OTM	122.20 kip-ft	2841.08		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	237.27	A	1	1.2	7	1	1	6.498	70.04	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	3219.33	3008.71	A	0.624	1.791	6	0.85	1	36.962	774.33	38.72	C
80.00-60.00			B	0.624	1.791		0.85	1	36.962			
			C	0.624	1.791		0.85	1	36.962			
T2	3145.59	3238.01	A	0.607	1.8	6	0.85	1	37.973	711.45	35.57	C
60.00-40.00			B	0.607	1.8		0.85	1	37.973			
			C	0.607	1.8		0.85	1	37.973			
T3	394.52	440.40	A	0.568	1.827	6	0.85	1	4.699	89.34	35.01	C
40.00-37.45			B	0.568	1.827		0.85	1	4.699			
			C	0.568	1.827		0.85	1	4.699			
T4	379.93	425.21	A	0.572	1.824	6	0.85	1	4.648	85.57	34.66	C
37.45-34.98			B	0.572	1.824		0.85	1	4.648			
			C	0.572	1.824		0.85	1	4.648			
T5	378.15	425.95	A	0.566	1.829	5	0.85	1	4.644	84.83	34.36	C
34.98-32.51			B	0.566	1.829		0.85	1	4.644			
			C	0.566	1.829		0.85	1	4.644			
T6	376.25	426.49	A	0.561	1.834	5	0.85	1	4.637	83.99	34.02	C
32.51-30.04			B	0.561	1.834		0.85	1	4.637			
			C	0.561	1.834		0.85	1	4.637			
T7	374.22	426.78	A	0.555	1.839	5	0.85	1	4.628	83.03	33.63	C
30.04-27.57			B	0.555	1.839		0.85	1	4.628			
			C	0.555	1.839		0.85	1	4.628			
T8	372.03	426.80	A	0.549	1.844	5	0.85	1	4.616	81.93	33.19	C
27.57-25.10			B	0.549	1.844		0.85	1	4.616			
			C	0.549	1.844		0.85	1	4.616			
T9	369.66	571.19	A	0.688	1.776	5	0.85	1	6.621	80.87	32.76	C
25.10-22.64			B	0.688	1.776		0.85	1	6.621			
			C	0.688	1.776		0.85	1	6.621			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T10	391.74	676.58	A	0.756	1.79	5	0.85	1	8.314	87.20	33.09	C
22.64-20.00			B	0.756	1.79		0.85	1	8.314			
			C	0.756	1.79		0.85	1	8.314			
T11	376.21	470.12	A	0.526	1.868	5	0.85	1	4.678	80.23	31.44	C
20.00-17.45			B	0.526	1.868		0.85	1	4.678			
			C	0.526	1.868		0.85	1	4.678			
T12	360.61	450.25	A	0.527	1.867	5	0.85	1	4.589	75.49	30.58	C
17.45-14.98			B	0.527	1.867		0.85	1	4.589			
			C	0.527	1.867		0.85	1	4.589			
T13	356.89	447.64	A	0.52	1.876	5	0.85	1	4.546	74.65	30.24	C
14.98-12.51			B	0.52	1.876		0.85	1	4.546			
			C	0.52	1.876		0.85	1	4.546			
T14	352.53	444.00	A	0.511	1.886	5	0.85	1	4.490	74.90	30.34	C
12.51-10.04			B	0.511	1.886		0.85	1	4.490			
			C	0.511	1.886		0.85	1	4.490			
T15	347.25	582.36	A	0.638	1.785	5	0.85	1	6.368	75.24	30.48	C
10.04-7.57			B	0.638	1.785		0.85	1	6.368			
			C	0.638	1.785		0.85	1	6.368			
T16 7.57-5.10	340.47	572.68	A	0.624	1.791	5	0.85	1	6.224	75.26	30.49	C
			B	0.624	1.791		0.85	1	6.224			
			C	0.624	1.791		0.85	1	6.224			
T17 5.10-2.64	330.82	556.81	A	0.604	1.802	5	0.85	1	5.997	75.09	30.42	C
			B	0.604	1.802		0.85	1	5.997			
			C	0.604	1.802		0.85	1	5.997			
T18 2.64-0.00	332.81	615.98	A	0.629	1.789	5	0.85	1	6.835	79.77	30.27	C
			B	0.629	1.789		0.85	1	6.835			
			C	0.629	1.789		0.85	1	6.835			
Sum Weight:	12199.02	14443.23						OTM	122.25 kip-ft	2843.20		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	1	1	7.139	593.47	29.67	C
80.00-60.00			B	0.163	2.725		1	1	7.139			
			C	0.163	2.725		1	1	7.139			
T2	764.00	1354.01	A	0.179	2.668	9	1	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		1	1	8.009			
			C	0.179	2.668		1	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	1	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		1	1	1.104			
			C	0.179	2.666		1	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	1	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		1	1	1.070			
			C	0.177	2.674		1	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	1	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		1	1	1.076			
			C	0.176	2.679		1	1	1.076			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	94.31	195.23	A	0.175	2.683	8	1	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		1	1	1.083			
			C	0.175	2.683		1	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	1	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		1	1	1.090			
			C	0.173	2.688		1	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	1	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		1	1	1.097			
			C	0.172	2.692		1	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	1	1	1.828	69.00	27.95	C
25.10-22.64			B	0.233	2.49		1	1	1.828			
			C	0.233	2.49		1	1	1.828			
T10	100.67	289.48	A	0.251	2.434	7	1	1	2.101	73.46	27.87	C
22.64-20.00			B	0.251	2.434		1	1	2.101			
			C	0.251	2.434		1	1	2.101			
T11	97.49	238.72	A	0.177	2.675	7	1	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		1	1	1.221			
			C	0.177	2.675		1	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	1	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		1	1	1.182			
			C	0.175	2.682		1	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	1	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		1	1	1.189			
			C	0.174	2.687		1	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	1	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		1	1	1.196			
			C	0.172	2.691		1	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	1	1	1.988	64.90	26.29	C
10.04-7.57			B	0.233	2.489		1	1	1.988			
			C	0.233	2.489		1	1	1.988			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	1	1	2.006	65.18	26.40	C
			B	0.232	2.492		1	1	2.006			
			C	0.232	2.492		1	1	2.006			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	1	1	2.023	65.46	26.52	C
			B	0.231	2.495		1	1	2.023			
			C	0.231	2.495		1	1	2.023			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	1	1	2.324	71.44	27.11	C
			B	0.25	2.438		1	1	2.324			
			C	0.25	2.438		1	1	2.324			
Sum Weight:	3056.00	6301.87						OTM	93.75 kip-ft	2203.59		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	0.8	1	6.942	589.27	29.46	C
80.00-60.00			B	0.163	2.725		0.8	1	6.942			
			C	0.163	2.725		0.8	1	6.942			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T2	764.00	1354.01	A	0.179	2.668	9	0.8	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		0.8	1	8.009			
			C	0.179	2.668		0.8	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	0.8	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		0.8	1	1.104			
			C	0.179	2.666		0.8	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	0.8	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		0.8	1	1.070			
			C	0.177	2.674		0.8	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	0.8	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		0.8	1	1.076			
			C	0.176	2.679		0.8	1	1.076			
T6	94.31	195.23	A	0.175	2.683	8	0.8	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		0.8	1	1.083			
			C	0.175	2.683		0.8	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	0.8	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		0.8	1	1.090			
			C	0.173	2.688		0.8	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	0.8	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		0.8	1	1.097			
			C	0.172	2.692		0.8	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	0.8	1	1.687	66.82	27.07	C
25.10-22.64			B	0.233	2.49		0.8	1	1.687			
			C	0.233	2.49		0.8	1	1.687			
T10	100.67	289.48	A	0.251	2.434	7	0.8	1	1.958	71.35	27.07	C
22.64-20.00			B	0.251	2.434		0.8	1	1.958			
			C	0.251	2.434		0.8	1	1.958			
T11	97.49	238.72	A	0.177	2.675	7	0.8	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		0.8	1	1.221			
			C	0.177	2.675		0.8	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	0.8	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		0.8	1	1.182			
			C	0.175	2.682		0.8	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	0.8	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		0.8	1	1.189			
			C	0.174	2.687		0.8	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	0.8	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		0.8	1	1.196			
			C	0.172	2.691		0.8	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	0.8	1	1.836	62.75	25.42	C
10.04-7.57			B	0.233	2.489		0.8	1	1.836			
			C	0.233	2.489		0.8	1	1.836			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	0.8	1	1.851	63.00	25.52	C
			B	0.232	2.492		0.8	1	1.851			
			C	0.232	2.492		0.8	1	1.851			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	0.8	1	1.867	63.25	25.62	C
			B	0.231	2.495		0.8	1	1.867			
			C	0.231	2.495		0.8	1	1.867			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	0.8	1	2.165	69.25	26.28	C
			B	0.25	2.438		0.8	1	2.165			
			C	0.25	2.438		0.8	1	2.165			
Sum Weight:	3056.00	6301.87						OTM	93.32 kip-ft	2186.37		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	0.00	113.41	A	1	1.2	10	1	1	3.750	58.20	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	764.00	1027.75	A	0.163	2.725	9	0.85	1	6.992	590.32	29.52	C
80.00-60.00			B	0.163	2.725		0.85	1	6.992			
			C	0.163	2.725		0.85	1	6.992			
T2	764.00	1354.01	A	0.179	2.668	9	0.85	1	8.009	540.14	27.01	C
60.00-40.00			B	0.179	2.668		0.85	1	8.009			
			C	0.179	2.668		0.85	1	8.009			
T3	97.49	203.42	A	0.179	2.666	8	0.85	1	1.104	66.81	26.18	C
40.00-37.45			B	0.179	2.666		0.85	1	1.104			
			C	0.179	2.666		0.85	1	1.104			
T4	94.31	193.04	A	0.177	2.674	8	0.85	1	1.070	63.81	25.85	C
37.45-34.98			B	0.177	2.674		0.85	1	1.070			
			C	0.177	2.674		0.85	1	1.070			
T5	94.31	194.13	A	0.176	2.679	8	0.85	1	1.076	63.03	25.53	C
34.98-32.51			B	0.176	2.679		0.85	1	1.076			
			C	0.176	2.679		0.85	1	1.076			
T6	94.31	195.23	A	0.175	2.683	8	0.85	1	1.083	62.18	25.19	C
32.51-30.04			B	0.175	2.683		0.85	1	1.083			
			C	0.175	2.683		0.85	1	1.083			
T7	94.31	196.33	A	0.173	2.688	8	0.85	1	1.090	61.26	24.82	C
30.04-27.57			B	0.173	2.688		0.85	1	1.090			
			C	0.173	2.688		0.85	1	1.090			
T8	94.31	197.43	A	0.172	2.692	7	0.85	1	1.097	60.27	24.41	C
27.57-25.10			B	0.172	2.692		0.85	1	1.097			
			C	0.172	2.692		0.85	1	1.097			
T9	94.31	242.83	A	0.233	2.49	7	0.85	1	1.723	67.36	27.29	C
25.10-22.64			B	0.233	2.49		0.85	1	1.723			
			C	0.233	2.49		0.85	1	1.723			
T10	100.67	289.48	A	0.251	2.434	7	0.85	1	1.994	71.88	27.27	C
22.64-20.00			B	0.251	2.434		0.85	1	1.994			
			C	0.251	2.434		0.85	1	1.994			
T11	97.49	238.72	A	0.177	2.675	7	0.85	1	1.221	59.25	23.22	C
20.00-17.45			B	0.177	2.675		0.85	1	1.221			
			C	0.177	2.675		0.85	1	1.221			
T12	94.31	226.54	A	0.175	2.682	7	0.85	1	1.182	55.67	22.55	C
17.45-14.98			B	0.175	2.682		0.85	1	1.182			
			C	0.175	2.682		0.85	1	1.182			
T13	94.31	227.66	A	0.174	2.687	7	0.85	1	1.189	54.97	22.27	C
14.98-12.51			B	0.174	2.687		0.85	1	1.189			
			C	0.174	2.687		0.85	1	1.189			
T14	94.31	228.77	A	0.172	2.691	7	0.85	1	1.196	55.10	22.32	C
12.51-10.04			B	0.172	2.691		0.85	1	1.196			
			C	0.172	2.691		0.85	1	1.196			
T15	94.31	277.96	A	0.233	2.489	7	0.85	1	1.874	63.29	25.64	C
10.04-7.57			B	0.233	2.489		0.85	1	1.874			
			C	0.233	2.489		0.85	1	1.874			
T16 7.57-5.10	94.31	279.71	A	0.232	2.492	7	0.85	1	1.890	63.54	25.74	C
			B	0.232	2.492		0.85	1	1.890			
			C	0.232	2.492		0.85	1	1.890			
T17 5.10-2.64	94.31	281.46	A	0.231	2.495	7	0.85	1	1.906	63.80	25.84	C
			B	0.231	2.495		0.85	1	1.906			
			C	0.231	2.495		0.85	1	1.906			
T18 2.64-0.00	100.67	334.00	A	0.25	2.438	7	0.85	1	2.205	69.80	26.49	C
			B	0.25	2.438		0.85	1	2.205			
			C	0.25	2.438		0.85	1	2.205			
Sum Weight:	3056.00	6301.87						OTM	93.43 kip-ft	2190.68		

Discrete Appurtenance Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20' 8 Bay Di-Pole	240.0000	55.00	-0.16	0.09	90.00	1.238	25	4.00	4.00
10' Omni	240.0000	30.00	-4.39	-3.24	85.00	1.223	25	2.00	2.00
7' Whip	120.0000	37.30	4.39	-3.24	83.00	1.217	25	1.74	1.74
7770	0.0000	35.00	-5.00	-4.02	78.00	1.201	25	5.51	2.93
7770	120.0000	35.00	5.98	-2.32	78.00	1.201	25	5.51	2.93
7770	240.0000	35.00	-0.98	6.34	78.00	1.201	25	5.51	2.93
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	101.05	0.00	-4.02	78.00	1.201	25	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	120.0000	101.05	3.48	2.01	78.00	1.201	25	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	101.05	-3.48	2.01	78.00	1.201	25	9.72	7.15
800-10965	0.0000	137.80	0.00	-4.02	78.00	1.201	25	14.16	7.73
800-10965	120.0000	137.80	3.48	2.01	78.00	1.201	25	14.16	7.73
800-10965	240.0000	137.80	-3.48	2.01	78.00	1.201	25	14.16	7.73
QS66512-2	0.0000	111.00	-5.00	-4.02	78.00	1.201	25	8.13	6.80
QS66512-2	120.0000	111.00	5.98	-2.32	78.00	1.201	25	8.13	6.80
QS66512-2	240.0000	111.00	-0.98	6.34	78.00	1.201	25	8.13	6.80
TMA	0.0000	20.00	0.00	-4.02	78.00	1.201	25	1.00	0.41
TMA	120.0000	20.00	3.48	2.01	78.00	1.201	25	1.00	0.41
TMA	240.0000	20.00	-3.48	2.01	78.00	1.201	25	1.00	0.41
RRUS 32	0.0000	52.90	0.00	-4.02	78.00	1.201	25	2.72	1.67
RRUS 32	120.0000	52.90	3.48	2.01	78.00	1.201	25	2.72	1.67
RRUS 32	240.0000	52.90	-3.48	2.01	78.00	1.201	25	2.72	1.67
RRU B14 4478	0.0000	47.40	0.00	-4.02	78.00	1.201	25	1.86	0.82
RRU B14 4478	120.0000	47.40	3.48	2.01	78.00	1.201	25	1.86	0.82
RRU B14 4478	240.0000	47.40	-3.48	2.01	78.00	1.201	25	1.86	0.82
RRUS 4478 B5	0.0000	59.90	0.00	-4.02	78.00	1.201	25	1.84	1.06
RRUS 4478 B5	120.0000	59.90	3.48	2.01	78.00	1.201	25	1.84	1.06
RRUS 4478 B5	240.0000	59.90	-3.48	2.01	78.00	1.201	25	1.84	1.06
RRUS 4426 B66	0.0000	46.00	0.00	-4.02	78.00	1.201	25	1.65	0.68
RRUS 4426 B66	120.0000	46.00	3.48	2.01	78.00	1.201	25	1.65	0.68
RRUS 4426 B66	240.0000	46.00	-3.48	2.01	78.00	1.201	25	1.65	0.68
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	50.70	0.00	-4.02	78.00	1.201	25	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	50.70	3.48	2.01	78.00	1.201	25	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	50.70	-3.48	2.01	78.00	1.201	25	0.88	1.18
RRUS 32 B2	0.0000	52.90	0.00	-4.02	78.00	1.201	25	2.72	1.67
RRUS 32 B2	120.0000	52.90	3.48	2.01	78.00	1.201	25	2.72	1.67
RRUS 32 B2	240.0000	52.90	-3.48	2.01	78.00	1.201	25	2.72	1.67
DC6-48-60-18-8C	300.0000	26.20	-1.74	-1.01	78.00	1.201	25	0.55	0.55
DC6-48-60-18-8C	120.0000	26.20	2.62	1.51	78.00	1.201	25	0.55	0.55

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
DC6-48-60-18-8C	240.0000	26.20	-2.62	1.51	78.00	1.201	25	0.55	0.55
Pirod 12' PCS T-Frame (1) 104569	0.0000	260.00	0.00	-2.02	78.00	1.201	25	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	120.0000	260.00	1.75	1.01	78.00	1.201	25	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	240.0000	260.00	-1.75	1.01	78.00	1.201	25	9.80	9.80
7' Whip	120.0000	37.30	1.75	1.01	71.00	1.178	24	1.74	1.74
10' Omni	240.0000	30.00	-8.21	-2.19	65.00	1.156	24	2.00	2.00
1.5" Dia 4' Omni w/Pipe Mount	240.0000	22.30	-6.95	4.01	62.00	1.144	23	0.94	0.94
4 ' Side Arm	240.0000	72.00	-3.54	2.05	55.00	1.116	23	2.60	2.60
4 ' Side Arm	120.0000	72.00	3.54	2.05	55.00	1.116	23	2.60	2.60
10' Omni	120.0000	30.00	4.41	2.55	60.00	1.137	23	2.00	2.00
10' Yagi	240.0000	120.00	-4.41	2.55	55.00	1.116	23	4.00	4.00
6' Side Arm	240.0000	160.00	-4.35	2.51	65.00	1.156	24	8.70	8.70
6' Side Arm	120.0000	160.00	4.35	2.51	65.00	1.156	24	8.70	8.70
	Sum Weight:	3828.45							

Discrete Appurtenance Pressures - With Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
20' 8 Bay Di-Pole	240.0000	204.25	-0.16	0.09	90.00	1.238	7	10.63	10.63	1.6583
10' Omni	240.0000	108.95	-4.39	-3.24	85.00	1.223	7	5.13	5.13	1.6489
7' Whip	120.0000	115.52	4.39	-3.24	83.00	1.217	7	4.06	4.06	1.6449
7770	0.0000	162.21	-5.00	-4.02	78.00	1.201	7	6.71	4.09	1.6347
7770	120.0000	162.21	5.98	-2.32	78.00	1.201	7	6.71	4.09	1.6347
7770	240.0000	162.21	-0.98	6.34	78.00	1.201	7	6.71	4.09	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	385.34	0.00	-4.02	78.00	1.201	7	11.52	10.39	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	120.0000	385.34	3.48	2.01	78.00	1.201	7	11.52	10.39	1.6347
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	385.34	-3.48	2.01	78.00	1.201	7	11.52	10.39	1.6347
800-10965	0.0000	497.61	0.00	-4.02	78.00	1.201	7	16.31	11.50	1.6347
800-10965	120.0000	497.61	3.48	2.01	78.00	1.201	7	16.31	11.50	1.6347
800-10965	240.0000	497.61	-3.48	2.01	78.00	1.201	7	16.31	11.50	1.6347
QS66512-2	0.0000	324.64	-5.00	-4.02	78.00	1.201	7	9.66	8.31	1.6347
QS66512-2	120.0000	324.64	5.98	-2.32	78.00	1.201	7	9.66	8.31	1.6347
QS66512-2	240.0000	324.64	-0.98	6.34	78.00	1.201	7	9.66	8.31	1.6347
TMA	0.0000	53.24	0.00	-4.02	78.00	1.201	7	1.44	0.73	1.6347
TMA	120.0000	53.24	3.48	2.01	78.00	1.201	7	1.44	0.73	1.6347
TMA	240.0000	53.24	-3.48	2.01	78.00	1.201	7	1.44	0.73	1.6347
RRUS 32	0.0000	135.36	0.00	-4.02	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32	120.0000	135.36	3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32	240.0000	135.36	-3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRU B14 4478	0.0000	104.68	0.00	-4.02	78.00	1.201	7	2.44	1.26	1.6347
RRU B14 4478	120.0000	104.68	3.48	2.01	78.00	1.201	7	2.44	1.26	1.6347
RRU B14 4478	240.0000	104.68	-3.48	2.01	78.00	1.201	7	2.44	1.26	1.6347

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
RRUS 4478 B5	0.0000	123.29	0.00	-4.02	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4478 B5	120.0000	123.29	3.48	2.01	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4478 B5	240.0000	123.29	-3.48	2.01	78.00	1.201	7	2.43	1.54	1.6347
RRUS 4426 B66	0.0000	97.17	0.00	-4.02	78.00	1.201	7	2.21	1.09	1.6347
RRUS 4426 B66	120.0000	97.17	3.48	2.01	78.00	1.201	7	2.21	1.09	1.6347
RRUS 4426 B66	240.0000	97.17	-3.48	2.01	78.00	1.201	7	2.21	1.09	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	93.30	0.00	-4.02	78.00	1.201	7	1.36	1.70	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	93.30	3.48	2.01	78.00	1.201	7	1.36	1.70	1.6347
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	93.30	-3.48	2.01	78.00	1.201	7	1.36	1.70	1.6347
RRUS 32 B2	0.0000	135.36	0.00	-4.02	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32 B2	120.0000	135.36	3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
RRUS 32 B2	240.0000	135.36	-3.48	2.01	78.00	1.201	7	3.48	2.31	1.6347
DC6-48-60-18-8C	300.0000	70.76	-1.74	-1.01	78.00	1.201	7	1.24	1.24	1.6347
DC6-48-60-18-8C	120.0000	70.76	2.62	1.51	78.00	1.201	7	1.24	1.24	1.6347
DC6-48-60-18-8C	240.0000	70.76	-2.62	1.51	78.00	1.201	7	1.24	1.24	1.6347
Pirod 12' PCS T-Frame (1) 104569	0.0000	586.95	0.00	-2.02	78.00	1.201	7	26.15	26.15	1.6347
Pirod 12' PCS T-Frame (1) 104569	120.0000	586.95	1.75	1.01	78.00	1.201	7	26.15	26.15	1.6347
Pirod 12' PCS T-Frame (1) 104569	240.0000	586.95	-1.75	1.01	78.00	1.201	7	26.15	26.15	1.6347
7' Whip	120.0000	113.06	1.75	1.01	71.00	1.178	6	4.01	4.01	1.6052
10' Omni	240.0000	106.16	-8.21	-2.19	65.00	1.156	6	5.06	5.06	1.6052
1.5" Dia 4' Omni w/Pipe Mount	240.0000	71.62	-6.95	4.01	62.00	1.144	6	2.29	2.29	1.6052
4 ' Side Arm	240.0000	149.98	-3.54	2.05	55.00	1.116	6	3.89	3.89	1.5786
4 ' Side Arm	120.0000	149.98	3.54	2.05	55.00	1.116	6	3.89	3.89	1.5786
10' Omni	120.0000	104.46	4.41	2.55	60.00	1.137	6	5.01	5.01	1.5786
10' Yagi	240.0000	435.72	-4.41	2.55	55.00	1.116	6	18.84	18.84	1.5786
6' Side Arm	240.0000	213.11	-4.35	2.51	65.00	1.156	6	4.12	4.12	1.6052
6' Side Arm	120.0000	213.11	4.35	2.51	65.00	1.156	6	4.12	4.12	1.6052
	Sum Weight:	10295.65								

Discrete Appurtenance Pressures - Service

G_H = 0.850 (base tower), 1.350 (upper structure)

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20' 8 Bay Di-Pole	240.0000	55.00	-0.16	0.09	90.00	1.238	10	4.00	4.00
10' Omni	240.0000	30.00	-4.39	-3.24	85.00	1.223	10	2.00	2.00
7' Whip	120.0000	37.30	4.39	-3.24	83.00	1.217	10	1.74	1.74
7770	0.0000	35.00	-5.00	-4.02	78.00	1.201	9	5.51	2.93
7770	120.0000	35.00	5.98	-2.32	78.00	1.201	9	5.51	2.93
7770	240.0000	35.00	-0.98	6.34	78.00	1.201	9	5.51	2.93
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	0.0000	101.05	0.00	-4.02	78.00	1.201	9	9.72	7.15
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft	120.0000	101.05	3.48	2.01	78.00	1.201	9	9.72	7.15

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Pipe									
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe	240.0000	101.05	-3.48	2.01	78.00	1.201	9	9.72	7.15
800-10965	0.0000	137.80	0.00	-4.02	78.00	1.201	9	14.16	7.73
800-10965	120.0000	137.80	3.48	2.01	78.00	1.201	9	14.16	7.73
800-10965	240.0000	137.80	-3.48	2.01	78.00	1.201	9	14.16	7.73
QS66512-2	0.0000	111.00	-5.00	-4.02	78.00	1.201	9	8.13	6.80
QS66512-2	120.0000	111.00	5.98	-2.32	78.00	1.201	9	8.13	6.80
QS66512-2	240.0000	111.00	-0.98	6.34	78.00	1.201	9	8.13	6.80
TMA	0.0000	20.00	0.00	-4.02	78.00	1.201	9	1.00	0.41
TMA	120.0000	20.00	3.48	2.01	78.00	1.201	9	1.00	0.41
TMA	240.0000	20.00	-3.48	2.01	78.00	1.201	9	1.00	0.41
RRUS 32	0.0000	52.90	0.00	-4.02	78.00	1.201	9	2.72	1.67
RRUS 32	120.0000	52.90	3.48	2.01	78.00	1.201	9	2.72	1.67
RRUS 32	240.0000	52.90	-3.48	2.01	78.00	1.201	9	2.72	1.67
RRU B14 4478	0.0000	47.40	0.00	-4.02	78.00	1.201	9	1.86	0.82
RRU B14 4478	120.0000	47.40	3.48	2.01	78.00	1.201	9	1.86	0.82
RRU B14 4478	240.0000	47.40	-3.48	2.01	78.00	1.201	9	1.86	0.82
RRUS 4478 B5	0.0000	59.90	0.00	-4.02	78.00	1.201	9	1.84	1.06
RRUS 4478 B5	120.0000	59.90	3.48	2.01	78.00	1.201	9	1.84	1.06
RRUS 4478 B5	240.0000	59.90	-3.48	2.01	78.00	1.201	9	1.84	1.06
RRUS 4426 B66	0.0000	46.00	0.00	-4.02	78.00	1.201	9	1.65	0.68
RRUS 4426 B66	120.0000	46.00	3.48	2.01	78.00	1.201	9	1.65	0.68
RRUS 4426 B66	240.0000	46.00	-3.48	2.01	78.00	1.201	9	1.65	0.68
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	0.0000	50.70	0.00	-4.02	78.00	1.201	9	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	120.0000	50.70	3.48	2.01	78.00	1.201	9	0.88	1.18
RRUS11 B12 (Partiall Shielded by 11.9" Antenna)	240.0000	50.70	-3.48	2.01	78.00	1.201	9	0.88	1.18
RRUS 32 B2	0.0000	52.90	0.00	-4.02	78.00	1.201	9	2.72	1.67
RRUS 32 B2	120.0000	52.90	3.48	2.01	78.00	1.201	9	2.72	1.67
RRUS 32 B2	240.0000	52.90	-3.48	2.01	78.00	1.201	9	2.72	1.67
DC6-48-60-18-8C	300.0000	26.20	-1.74	-1.01	78.00	1.201	9	0.55	0.55
DC6-48-60-18-8C	120.0000	26.20	2.62	1.51	78.00	1.201	9	0.55	0.55
DC6-48-60-18-8C	240.0000	26.20	-2.62	1.51	78.00	1.201	9	0.55	0.55
Pirod 12' PCS T-Frame (1) 104569	0.0000	260.00	0.00	-2.02	78.00	1.201	9	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	120.0000	260.00	1.75	1.01	78.00	1.201	9	9.80	9.80
Pirod 12' PCS T-Frame (1) 104569	240.0000	260.00	-1.75	1.01	78.00	1.201	9	9.80	9.80
7' Whip	120.0000	37.30	1.75	1.01	71.00	1.178	9	1.74	1.74
10' Omni	240.0000	30.00	-8.21	-2.19	65.00	1.156	9	2.00	2.00
1.5" Dia 4' Omni w/Pipe Mount	240.0000	22.30	-6.95	4.01	62.00	1.144	9	0.94	0.94
4 ' Side Arm	240.0000	72.00	-3.54	2.05	55.00	1.116	9	2.60	2.60
4 ' Side Arm	120.0000	72.00	3.54	2.05	55.00	1.116	9	2.60	2.60
10' Omni	120.0000	30.00	4.41	2.55	60.00	1.137	9	2.00	2.00
10' Yagi	240.0000	120.00	-4.41	2.55	55.00	1.116	9	4.00	4.00
6' Side Arm	240.0000	160.00	-4.35	2.51	65.00	1.156	9	8.70	8.70
6' Side Arm	120.0000	160.00	4.35	2.51	65.00	1.156	9	8.70	8.70
	Sum Weight:	3828.45							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
73.00	2' dish	120.0000	15.00	1.75	1.01	1.184	3.14	24
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	12.57	24
		Sum Weight:	95.00					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf	t_z in
73.00	2' dish	120.0000	86.85	1.75	1.01	1.184	4.01	6	1.6239
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	14.28	6	1.6239
		Sum Weight:	166.85						

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
73.00	2' dish	120.0000	15.00	1.75	1.01	1.184	3.14	9
73.00	4' dish	0.0000	80.00	0.00	-2.02	1.184	12.57	9
		Sum Weight:	95.00					

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	3070.68					
Bracing Weight	3231.19					
Total Member Self-Weight	6301.87			3.59	0.92	
Total Weight	13281.32			3.59	0.92	
Wind 0 deg - No Ice		0.00	-9745.69	-541.43	0.92	-0.38
Wind 30 deg - No Ice		4855.97	-8410.79	-467.68	-271.16	0.14
Wind 60 deg - No Ice		8401.05	-4850.35	-268.35	-470.10	0.62
Wind 90 deg - No Ice		9711.94	0.00	3.59	-543.25	0.93
Wind 120 deg - No Ice		8440.01	4872.84	276.10	-471.08	1.00
Wind 150 deg - No Ice		4855.97	8410.79	474.85	-271.16	0.79
Wind 180 deg - No Ice		0.00	9700.69	547.47	0.92	0.38
Wind 210 deg - No Ice		-4855.97	8410.79	474.85	273.00	-0.14
Wind 240 deg - No Ice		-8440.01	4872.84	276.10	472.92	-0.62
Wind 270 deg - No Ice		-9711.94	0.00	3.59	545.09	-0.93
Wind 300 deg - No Ice		-8401.05	-4850.35	-268.35	471.94	-0.99
Wind 330 deg - No Ice		-4855.97	-8410.79	-467.68	273.00	-0.79
Member Ice	8141.36					

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Weight Ice	37104.76			10.76	1.28	
Wind 0 deg - Ice		0.00	-4515.54	-237.51	1.28	-0.53
Wind 30 deg - Ice		2254.60	-3905.08	-204.12	-122.78	-0.35
Wind 60 deg - Ice		3903.25	-2253.54	-113.27	-213.55	-0.07
Wind 90 deg - Ice		4509.20	0.00	10.76	-246.84	0.23
Wind 120 deg - Ice		3910.58	2257.77	134.90	-213.73	0.46
Wind 150 deg - Ice		2254.60	3905.08	225.64	-122.78	0.57
Wind 180 deg - Ice		0.00	4507.09	258.83	1.28	0.53
Wind 210 deg - Ice		-2254.60	3905.08	225.64	125.35	0.35
Wind 240 deg - Ice		-3910.58	2257.77	134.90	216.30	0.07
Wind 270 deg - Ice		-4509.20	0.00	10.76	249.41	-0.23
Wind 300 deg - Ice		-3903.25	-2253.54	-113.27	216.12	-0.46
Wind 330 deg - Ice		-2254.60	-3905.08	-204.12	125.35	-0.57
Total Weight	13281.32			3.59	0.92	
Wind 0 deg - Service		0.00	-3740.64	-208.30	0.73	-0.14
Wind 30 deg - Service		1863.87	-3228.31	-179.95	-103.88	0.05
Wind 60 deg - Service		3224.58	-1861.71	-103.32	-180.36	0.24
Wind 90 deg - Service		3727.73	0.00	1.24	-208.48	0.36
Wind 120 deg - Service		3239.49	1870.32	106.00	-180.73	0.38
Wind 150 deg - Service		1863.87	3228.31	182.42	-103.88	0.30
Wind 180 deg - Service		0.00	3723.43	210.34	0.73	0.14
Wind 210 deg - Service		-1863.87	3228.31	182.42	105.33	-0.05
Wind 240 deg - Service		-3239.49	1870.32	106.00	182.19	-0.24
Wind 270 deg - Service		-3727.73	0.00	1.24	209.94	-0.36
Wind 300 deg - Service		-3224.58	-1861.71	-103.32	181.82	-0.38
Wind 330 deg - Service		-1863.87	-3228.31	-179.95	105.33	-0.30

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice

Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	90 - 80	Pole	Max Tension	39	0.00	0.00	0.00
			Max. Compression	26	-713.13	0.00	0.76
			Max. Mx	8	-259.24	-4.08	0.23
			Max. My	2	-258.96	-0.03	4.31
			Max. Vy	8	625.28	-4.08	0.23
			Max. Vx	2	-625.40	-0.03	4.31
			Max. Torque	20			-0.64
T1	80 - 60	Leg	Max Tension	15	41819.45	0.01	-0.43
			Max. Compression	18	-45817.78	0.39	-0.23
			Max. Mx	20	-1807.84	-0.40	0.00
			Max. My	2	-45046.12	-0.01	0.45
			Max. Vy	38	-4641.26	0.39	-0.20
			Max. Vx	26	-5347.48	0.00	-0.00
		Diagonal	Max Tension	17	3701.42	0.00	0.00
			Max. Compression	16	-3873.26	0.00	0.00
			Max. Mx	35	607.40	-0.00	0.00
			Max. My	10	-3326.00	0.00	-0.00
			Max. Vy	35	7.67	-0.00	0.00
			Max. Vx	10	-0.60	0.00	-0.00
		Horizontal	Max Tension	14	1299.66	0.00	0.00
			Max. Compression	16	-1161.12	0.00	0.00
			Max. Mx	26	398.97	0.01	0.00
			Max. My	22	-321.41	0.00	-0.00
			Max. Vy	26	11.50	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Top Girt	Max Tension	27	3403.54	0.00	0.00
			Max. Compression	4	-3804.16	0.00	0.00
			Max. Mx	26	3119.61	-0.03	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	12	-3397.05	0.00	0.00
			Max. Vy	26	38.39	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1305.89	0.00	0.00
			Max. Compression	19	-1181.75	0.00	0.00
			Max. Mx	26	191.52	0.01	0.00
			Max. My	22	-530.42	0.00	-0.00
			Max. Vy	26	11.50	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Pole Socket	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-851.23	0.00	0.00
			Max. Mx	8	-293.50	-3.72	0.23
			Max. My	2	-294.06	-0.03	3.92
			Max. Vy	8	-373.48	-3.72	0.23
			Max. Vx	2	394.38	-0.03	3.92
		Pole Socket Support	Max Tension	18	2536.91	0.23	-0.01
			Max. Compression	13	-1274.68	0.00	0.00
			Max. Mx	29	775.81	0.55	-0.12
			Max. My	18	-898.81	0.30	3.66
			Max. Vy	29	273.39	0.55	-0.12
			Max. Vx	18	1810.22	0.30	3.66
T2	60 - 40	Leg	Max Tension	15	95443.01	0.33	0.01
			Max. Compression	18	-101492.86	0.39	0.01
			Max. Mx	18	-48757.18	0.74	-0.01
			Max. My	12	-2485.25	0.00	-0.40
			Max. Vy	2	-4517.32	0.39	0.01
			Max. Vx	24	-2082.10	0.00	0.20
		Diagonal	Max Tension	23	4101.74	0.00	0.00
			Max. Compression	10	-4320.79	0.00	0.00
			Max. Mx	18	2521.26	-0.01	0.00
			Max. My	16	-3759.59	0.00	0.00
			Max. Vy	35	9.69	-0.01	-0.00
			Max. Vx	16	-0.37	0.00	0.00
		Horizontal	Max Tension	14	2060.11	0.00	0.00
			Max. Compression	19	-1790.52	0.00	0.00
			Max. Mx	26	392.01	0.01	0.00
			Max. My	22	-609.39	0.00	-0.00
			Max. Vy	26	14.24	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Top Girt	Max Tension	33	168.95	0.00	0.00
			Max. Compression	13	-16.60	0.00	0.00
			Max. Mx	26	163.39	0.01	0.00
			Max. My	10	20.01	0.00	0.00
			Max. Vy	26	-12.67	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1560.99	0.00	0.00
			Max. Compression	19	-1423.89	0.00	0.00
			Max. Mx	26	199.05	0.01	0.00
			Max. My	22	-665.46	0.00	-0.00
			Max. Vy	26	14.46	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T3	40 - 37.4479	Leg	Max Tension	15	98337.50	-0.72	-0.01
			Max. Compression	18	-104382.93	-0.08	-0.00
			Max. Mx	2	-100038.36	0.77	0.02
			Max. My	24	-3806.01	0.00	0.37
			Max. Vy	2	-4531.32	0.77	0.02
			Max. Vx	24	-2082.33	0.00	0.37
		Diagonal	Max Tension	23	4199.47	0.00	0.00
			Max. Compression	10	-4416.43	0.00	0.00
			Max. Mx	14	3851.14	-0.01	0.00
			Max. My	20	-4272.42	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	35	9.38	-0.01	-0.00
			Max. Vx	20	0.44	0.00	-0.00
		Top Girt	Max Tension	14	727.73	0.00	0.00
			Max. Compression	19	-593.37	0.00	0.00
			Max. Mx	26	204.58	0.02	0.00
			Max. My	22	-312.96	0.00	-0.00
			Max. Vy	26	16.14	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T4	37.4479 - 34.9792	Leg	Max Tension	15	105272.14	0.07	0.00
			Max. Compression	18	-111586.22	0.15	0.00
			Max. Mx	18	-111586.22	0.15	0.00
			Max. My	12	-4005.85	0.00	-0.11
			Max. Vy	2	-100.73	0.15	0.00
			Max. Vx	24	-31.33	0.00	0.11
		Diagonal	Max Tension	22	3755.98	0.00	0.00
			Max. Compression	8	-3937.33	0.00	0.00
			Max. Mx	35	668.13	-0.01	-0.00
			Max. My	22	-3000.11	0.00	-0.00
			Max. Vy	35	9.53	-0.01	-0.00
			Max. Vx	22	-0.19	0.00	0.00
		Top Girt	Max Tension	14	1915.53	0.00	0.00
			Max. Compression	19	-1684.34	0.00	0.00
			Max. Mx	26	311.46	0.01	0.00
			Max. My	22	-823.45	0.00	-0.00
			Max. Vy	26	-14.21	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T5	34.9792 - 32.5104	Leg	Max Tension	15	111728.53	-0.15	-0.00
			Max. Compression	18	-118266.61	0.10	0.00
			Max. Mx	18	-118210.43	0.15	0.00
			Max. My	12	-4069.26	0.00	-0.11
			Max. Vy	2	28.09	0.15	0.00
			Max. Vx	24	9.22	0.00	0.11
		Diagonal	Max Tension	23	3897.52	0.00	0.00
			Max. Compression	10	-4082.85	0.00	0.00
			Max. Mx	35	675.01	-0.01	-0.00
			Max. My	22	-3054.87	0.00	-0.00
			Max. Vy	35	9.60	-0.01	-0.00
			Max. Vx	22	-0.22	0.00	0.00
		Top Girt	Max Tension	14	1747.90	0.00	0.00
			Max. Compression	19	-1542.88	0.00	0.00
			Max. Mx	26	291.57	0.01	0.00
			Max. My	22	-752.24	0.00	-0.00
			Max. Vy	26	14.33	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T6	32.5104 - 30.0417	Leg	Max Tension	15	118257.89	-0.10	0.00
			Max. Compression	18	-125022.46	0.11	0.00
			Max. Mx	14	118108.95	-0.11	-0.00
			Max. My	16	-3705.82	-0.00	0.11
			Max. Vy	6	11.00	-0.11	-0.00
			Max. Vx	4	9.99	-0.00	-0.11
		Diagonal	Max Tension	23	3917.46	0.00	0.00
			Max. Compression	10	-4107.70	0.00	0.00
			Max. Mx	35	674.84	-0.01	-0.00
			Max. My	22	-3057.96	0.00	-0.00
			Max. Vy	35	9.67	-0.01	-0.00
			Max. Vx	22	-0.21	0.00	0.00
		Top Girt	Max Tension	14	1842.72	0.00	0.00
			Max. Compression	19	-1625.91	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	26	296.61	0.02	0.00
			Max. My	22	-798.92	0.00	-0.00
			Max. Vy	26	14.43	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T7	30.0417 - 27.5729	Leg	Max Tension	15	124748.87	-0.11	-0.00
			Max. Compression	18	-131739.61	0.15	0.00
			Max. Mx	18	-131739.61	0.15	0.00
			Max. My	16	-3835.99	0.00	0.12
			Max. Vy	18	-24.61	0.15	0.00
			Max. Vx	16	-9.57	0.00	0.12
		Diagonal	Max Tension	23	3939.71	0.00	0.00
			Max. Compression	10	-4133.79	0.00	0.00
			Max. Mx	14	3617.06	-0.01	0.00
			Max. My	22	-3072.43	0.00	-0.00
			Max. Vy	35	9.74	-0.01	-0.00
			Max. Vx	22	-0.22	0.00	0.00
		Top Girt	Max Tension	14	1880.52	0.00	0.00
			Max. Compression	19	-1662.79	0.00	0.00
			Max. Mx	26	295.63	0.02	0.00
			Max. My	22	-819.35	0.00	-0.00
			Max. Vy	26	14.52	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T8	27.5729 - 25.1042	Leg	Max Tension	15	131216.93	-0.15	-0.00
			Max. Compression	18	-138442.29	-0.02	-0.00
			Max. Mx	18	-138386.09	0.15	0.00
			Max. My	16	-3963.50	-0.00	0.13
			Max. Vy	18	76.18	0.15	0.00
			Max. Vx	16	-14.51	-0.00	0.13
		Diagonal	Max Tension	23	4031.18	0.00	0.00
			Max. Compression	10	-4225.48	0.00	0.00
			Max. Mx	18	2605.33	-0.01	-0.00
			Max. My	22	-3103.44	0.00	-0.00
			Max. Vy	35	9.80	-0.01	-0.00
			Max. Vx	10	-0.19	0.00	0.00
		Top Girt	Max Tension	14	1989.83	0.00	0.00
			Max. Compression	19	-1757.95	0.00	0.00
			Max. Mx	26	307.12	0.02	0.00
			Max. My	22	-871.98	0.00	-0.00
			Max. Vy	26	-14.61	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T9	25.1042 - 22.6354	Leg	Max Tension	15	137498.14	0.01	-0.00
			Max. Compression	18	-144998.09	-0.29	-0.00
			Max. Mx	18	-144969.78	0.47	-0.00
			Max. My	12	-4622.99	-0.01	-0.18
			Max. Vy	18	613.68	0.47	-0.00
			Max. Vx	12	83.18	-0.01	-0.18
		Diagonal	Max Tension	23	4302.69	-0.01	-0.00
			Max. Compression	10	-4485.73	0.00	0.00
			Max. Mx	10	2756.76	-0.01	-0.00
			Max. My	24	-3324.39	0.00	-0.00
			Max. Vy	35	9.90	-0.01	-0.00
			Max. Vx	24	-0.55	0.00	-0.00
		Secondary Horizontal	Max Tension	16	521.22	0.00	-0.00
			Max. Compression	15	-629.05	0.00	0.00
			Max. Mx	28	-78.68	0.01	0.00
			Max. My	12	-557.52	0.00	0.00
			Max. Vy	28	-15.93	0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	24	-1.44	0.00	0.00
		Top Girt	Max Tension	14	1877.02	0.00	0.00
			Max. Compression	19	-1670.40	0.00	0.00
			Max. Mx	26	275.03	0.02	0.00
			Max. My	22	-815.80	0.00	-0.00
			Max. Vy	26	-14.67	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T10	22.6354 - 20	Leg	Max Tension	15	148347.25	0.62	0.01
			Max. Compression	18	-156383.65	0.21	0.00
			Max. Mx	2	-149920.04	-0.67	-0.01
			Max. My	12	-4879.13	-0.00	-0.18
			Max. Vy	2	-5298.50	0.21	0.00
			Max. Vx	24	-2038.55	-0.00	0.18
		Diagonal	Max Tension	23	4926.43	-0.00	-0.00
			Max. Compression	10	-5155.92	0.00	0.00
			Max. Mx	10	2524.47	-0.01	-0.00
			Max. My	8	271.71	-0.01	0.00
			Max. Vy	35	9.97	-0.01	-0.00
			Max. Vx	8	-0.53	-0.01	0.00
		Secondary Horizontal	Max Tension	10	926.74	0.00	-0.00
			Max. Compression	23	-1027.65	0.00	0.00
			Max. Mx	32	-22.06	0.01	0.00
			Max. My	18	-284.20	-0.00	0.00
			Max. Vy	32	16.83	0.01	0.00
			Max. Vx	18	-1.36	0.00	0.00
		Top Girt	Max Tension	14	1996.89	0.00	0.00
			Max. Compression	19	-1756.56	0.00	0.00
			Max. Mx	26	309.82	0.02	0.00
			Max. My	22	-844.22	0.00	-0.00
			Max. Vy	26	-14.71	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	14	1408.31	0.00	0.00
			Max. Compression	19	-1280.47	0.00	0.00
			Max. Mx	26	171.47	0.02	0.00
			Max. My	22	-619.84	0.00	-0.00
			Max. Vy	26	-17.18	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T11	20 - 17.4479	Leg	Max Tension	15	151143.90	-0.62	-0.01
			Max. Compression	18	-159200.28	0.03	-0.00
			Max. Mx	2	-154789.31	0.65	0.01
			Max. My	24	-4882.40	-0.00	0.35
			Max. Vy	2	-5227.98	0.65	0.01
			Max. Vx	24	-2038.83	-0.00	0.35
		Diagonal	Max Tension	23	4344.94	0.00	0.00
			Max. Compression	10	-4545.52	0.00	0.00
			Max. Mx	35	732.38	-0.01	-0.00
			Max. My	10	-4522.12	0.00	0.00
			Max. Vy	35	9.72	-0.01	-0.00
			Max. Vx	10	-0.42	0.00	0.00
		Top Girt	Max Tension	14	975.85	0.00	0.00
			Max. Compression	19	-844.52	0.00	0.00
			Max. Mx	26	183.47	0.02	0.00
			Max. My	22	-427.85	0.00	-0.00
			Max. Vy	26	-17.00	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T12	17.4479 - 14.9792	Leg	Max Tension	15	157845.13	-0.04	0.00
			Max. Compression	18	-166164.91	0.19	0.00
			Max. Mx	18	-166164.91	0.19	0.00
			Max. My	12	-5085.73	0.00	-0.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	2	-70.25	0.19	0.00
			Max. Vx	10	12.43	-0.09	-0.14
		Diagonal	Max Tension	9	4018.29	0.00	0.00
			Max. Compression	8	-4223.14	0.00	0.00
			Max. Mx	35	752.42	-0.01	-0.00
			Max. My	10	-4136.31	0.00	0.00
			Max. Vy	35	9.77	-0.01	-0.00
			Max. Vx	10	-0.18	0.00	0.00
		Top Girt	Max Tension	14	1897.39	0.00	0.00
			Max. Compression	19	-1669.96	0.00	0.00
			Max. Mx	26	223.61	0.02	0.00
			Max. My	22	-843.20	0.00	-0.00
			Max. Vy	26	14.73	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T13	14.9792 - 12.5104	Leg	Max Tension	15	164146.56	-0.19	-0.00
			Max. Compression	18	-172716.61	0.21	-0.00
			Max. Mx	18	-172716.61	0.21	-0.00
			Max. My	16	-4720.26	0.00	0.17
			Max. Vy	18	-12.99	0.21	-0.00
			Max. Vx	16	-10.98	0.00	0.17
		Diagonal	Max Tension	9	4072.42	0.00	0.00
			Max. Compression	8	-4280.10	0.00	0.00
			Max. Mx	35	751.60	-0.01	-0.00
			Max. My	10	-4212.44	0.00	0.00
			Max. Vy	35	9.74	-0.01	-0.00
			Max. Vx	10	-0.23	0.00	0.00
		Top Girt	Max Tension	14	1722.92	0.00	0.00
			Max. Compression	19	-1528.93	0.00	0.00
			Max. Mx	26	204.04	0.02	0.00
			Max. Vy	26	-14.69	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T14	12.5104 - 10.0417	Leg	Max Tension	15	170478.74	-0.20	-0.00
			Max. Compression	18	-179307.49	-0.01	-0.00
			Max. Mx	18	-179241.38	0.21	-0.00
			Max. My	16	-4861.05	-0.00	0.20
			Max. Vy	18	93.60	0.21	-0.00
			Max. Vx	16	-17.14	-0.00	0.20
		Diagonal	Max Tension	9	4140.75	0.00	0.00
			Max. Compression	8	-4341.98	0.00	0.00
			Max. Mx	35	760.51	-0.01	-0.00
			Max. My	10	-4283.40	0.00	0.00
			Max. Vy	35	9.70	-0.01	-0.00
			Max. Vx	10	-0.20	0.00	0.00
		Top Girt	Max Tension	14	1831.74	0.00	0.00
			Max. Compression	19	-1617.99	0.00	0.00
			Max. Mx	26	215.01	0.02	0.00
			Max. Vy	26	-14.62	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T15	10.0417 - 7.57292	Leg	Max Tension	15	176538.96	-0.01	-0.00
			Max. Compression	18	-185657.56	-0.32	-0.00
			Max. Mx	18	-185624.28	0.63	-0.00
			Max. My	16	-5001.96	-0.01	0.23
			Max. Vy	18	767.73	0.63	-0.00
			Max. Vx	16	-87.31	-0.01	0.23
		Diagonal	Max Tension	23	4473.12	-0.00	-0.00
			Max. Compression	8	-4682.32	0.00	0.00
			Max. Mx	10	2877.57	-0.01	-0.00
			Max. My	8	688.11	-0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	35	9.66	-0.01	-0.00
			Max. Vx	8	-0.43	-0.01	0.00
		Secondary Horizontal	Max Tension	16	657.32	0.00	-0.00
			Max. Compression	15	-777.90	0.00	0.00
			Max. Mx	31	-12.72	0.01	0.00
			Max. My	12	-687.31	0.00	0.00
			Max. Vy	31	16.05	0.01	0.00
			Max. Vx	24	-1.12	0.00	0.00
		Top Girt	Max Tension	14	1712.57	0.00	0.00
			Max. Compression	19	-1521.37	0.00	0.00
			Max. Mx	26	198.50	0.02	0.00
			Max. Vy	26	-14.47	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T16	7.57292 - 5.10417	Leg	Max Tension	15	182734.76	0.27	-0.00
			Max. Compression	18	-192142.01	-0.33	-0.00
			Max. Mx	18	-192120.55	0.69	-0.00
			Max. My	16	-5092.05	-0.01	0.23
			Max. Vy	18	-825.83	0.69	-0.00
			Max. Vx	16	83.48	-0.01	0.23
		Diagonal	Max Tension	23	4574.85	-0.00	-0.00
			Max. Compression	10	-4765.12	0.00	0.00
			Max. Mx	10	2730.85	-0.01	-0.00
			Max. My	8	540.64	-0.01	0.00
			Max. Vy	35	9.48	-0.01	-0.00
			Max. Vx	8	-0.42	-0.01	0.00
		Secondary Horizontal	Max Tension	16	846.50	0.00	-0.00
			Max. Compression	15	-960.87	0.00	0.00
			Max. Mx	30	-119.40	0.01	0.00
			Max. My	12	-853.46	0.00	0.00
			Max. Vy	30	15.38	0.01	0.00
			Max. Vx	24	-1.10	0.00	0.00
		Top Girt	Max Tension	14	1557.80	0.00	0.00
			Max. Compression	19	-1376.64	0.00	0.00
			Max. Mx	26	155.12	0.02	0.00
			Max. Vy	26	-14.23	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T17	5.10417 - 2.63542	Leg	Max Tension	15	189015.87	0.28	-0.00
			Max. Compression	18	-198715.65	-0.36	0.00
			Max. Mx	18	-198694.32	0.71	-0.00
			Max. My	12	-5794.92	-0.02	-0.29
			Max. Vy	18	871.28	0.71	-0.00
			Max. Vx	12	153.26	-0.02	-0.29
		Diagonal	Max Tension	9	4555.08	-0.00	0.00
			Max. Compression	8	-4763.03	0.00	0.00
			Max. Mx	10	2799.41	-0.01	-0.00
			Max. My	24	-3428.34	0.00	-0.00
			Max. Vy	35	9.31	-0.01	-0.00
			Max. Vx	24	-0.41	0.00	-0.00
		Secondary Horizontal	Max Tension	16	928.33	0.00	-0.00
			Max. Compression	15	-1011.17	0.00	0.00
			Max. Mx	32	-288.36	0.01	0.00
			Max. My	12	-933.21	0.00	0.00
			Max. Vy	32	16.85	0.01	0.00
			Max. Vx	12	1.09	0.00	0.00
		Top Girt	Max Tension	14	1530.45	0.00	0.00
			Max. Compression	19	-1360.24	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	26	321.69	0.02	0.00
			Max. Vy	26	-13.80	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
T18	2.63542 - 0	Leg	Max Tension	15	199727.66	1.02	0.01
			Max. Compression	18	-210023.99	0.00	-0.00
			Max. Mx	29	44424.39	1.65	-0.00
			Max. My	12	-5852.96	-0.02	-0.29
			Max. Vy	29	9913.79	0.00	-0.00
			Max. Vx	25	-1394.45	-0.00	-0.00
		Diagonal	Max Tension	23	5443.55	-0.00	-0.00
			Max. Compression	10	-5704.92	0.00	0.00
			Max. Mx	10	2629.00	-0.01	-0.00
			Max. My	8	260.35	-0.01	0.00
			Max. Vy	35	8.18	-0.00	0.00
			Max. Vx	8	-0.40	-0.01	0.00
		Secondary Horizontal	Max Tension	10	1359.94	0.01	-0.00
			Max. Compression	23	-1434.42	0.00	0.00
			Max. Mx	35	-877.48	-0.02	0.00
			Max. My	10	-433.04	-0.00	0.00
			Max. Vy	35	17.23	0.00	0.00
			Max. Vx	18	-0.97	0.00	0.00
		Top Girt	Max Tension	14	1868.18	0.00	0.00
			Max. Compression	19	-1633.45	0.00	0.00
			Max. Mx	26	-426.76	0.02	0.00
			Max. Vy	26	-12.80	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
		Bottom Girt	Max Tension	37	4725.71	0.00	0.00
			Max. Compression	19	-457.68	0.00	0.00
			Max. Mx	26	4598.00	0.02	0.00
			Max. Vy	26	-15.34	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	209930.41	7967.31	-4460.60
	Max. H_x	18	209930.41	7967.31	-4460.60
	Max. H_z	28	-36338.31	-8784.34	5339.25
	Min. Vert	7	-198309.82	-8017.77	4489.12
	Min. H_x	29	-44250.74	-9200.62	5339.14
	Min. H_z	18	209930.41	7967.31	-4460.60
Leg B	Max. Vert	10	209481.63	-7998.97	-4398.32
	Max. H_x	37	-44879.72	9236.16	5289.72
	Max. H_z	37	-44879.72	9236.16	5289.72
	Min. Vert	23	-198645.84	8057.44	4426.94
	Min. H_x	10	209481.63	-7998.97	-4398.32
	Min. H_z	10	209481.63	-7998.97	-4398.32
Leg A	Max. Vert	2	208192.25	-69.59	9115.66
	Max. H_x	21	3228.42	1052.61	110.89
	Max. H_z	2	208192.25	-69.59	9115.66
	Min. Vert	15	-199608.00	74.02	-9200.58
	Min. H_x	9	3228.05	-1056.09	110.91
	Min. H_z	33	-48633.04	60.66	-10679.12

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Dead Only	13281.32	-0.00	0.00	3.62	0.93	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15937.59	0.00	-15593.10	-878.49	1.13	-0.62
0.9 Dead+1.6 Wind 0 deg - No Ice	11953.19	0.00	-15593.10	-876.88	0.84	-0.62
1.2 Dead+1.6 Wind 30 deg - No Ice	15937.59	7769.55	-13457.26	-759.02	-439.63	0.24
0.9 Dead+1.6 Wind 30 deg - No Ice	11953.19	7769.55	-13457.26	-757.77	-438.55	0.24
1.2 Dead+1.6 Wind 60 deg - No Ice	15937.59	13441.68	-7760.56	-436.14	-761.88	1.04
0.9 Dead+1.6 Wind 60 deg - No Ice	11953.19	13441.68	-7760.56	-435.88	-759.81	1.03
1.2 Dead+1.6 Wind 90 deg - No Ice	15937.59	15539.11	0.00	4.38	-880.37	1.57
0.9 Dead+1.6 Wind 90 deg - No Ice	11953.19	15539.11	0.00	3.28	-877.93	1.55
1.2 Dead+1.6 Wind 120 deg - No Ice	15937.59	13504.02	7796.55	445.81	-763.45	1.68
0.9 Dead+1.6 Wind 120 deg - No Ice	11953.19	13504.02	7796.55	443.35	-761.38	1.66
1.2 Dead+1.6 Wind 150 deg - No Ice	15937.59	7769.55	13457.26	767.77	-439.61	1.33
0.9 Dead+1.6 Wind 150 deg - No Ice	11953.19	7769.55	13457.26	764.31	-438.54	1.31
1.2 Dead+1.6 Wind 180 deg - No Ice	15937.59	0.00	15521.11	885.40	1.12	0.63
0.9 Dead+1.6 Wind 180 deg - No Ice	11953.19	0.00	15521.11	881.58	0.84	0.62
1.2 Dead+1.6 Wind 210 deg - No Ice	15937.59	-7769.55	13457.26	767.76	441.86	-0.25
0.9 Dead+1.6 Wind 210 deg - No Ice	11953.19	-7769.55	13457.26	764.31	440.22	-0.24
1.2 Dead+1.6 Wind 240 deg - No Ice	15937.59	-13504.02	7796.55	445.81	765.70	-1.05
0.9 Dead+1.6 Wind 240 deg - No Ice	11953.19	-13504.02	7796.55	443.34	763.06	-1.04
1.2 Dead+1.6 Wind 270 deg - No Ice	15937.59	-15539.11	0.00	4.38	882.62	-1.57
0.9 Dead+1.6 Wind 270 deg - No Ice	11953.19	-15539.11	0.00	3.27	879.61	-1.55
1.2 Dead+1.6 Wind 300 deg - No Ice	15937.59	-13441.68	-7760.56	-436.14	764.13	-1.67
0.9 Dead+1.6 Wind 300 deg - No Ice	11953.19	-13441.68	-7760.56	-435.88	761.49	-1.65
1.2 Dead+1.6 Wind 330 deg - No Ice	15937.59	-7769.55	-13457.26	-759.02	441.89	-1.33
0.9 Dead+1.6 Wind 330 deg - No Ice	11953.19	-7769.55	-13457.26	-757.77	440.24	-1.31
1.2 Dead+1.0 Ice+1.0 Temp	39640.16	0.00	-0.00	11.72	1.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	39640.16	0.00	-4515.54	-244.53	1.58	-0.55
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	39640.16	2254.60	-3905.08	-210.06	-126.48	-0.33
1.2 Dead+1.0 Wind 60 deg+1.0	39640.16	3903.25	-2253.54	-116.28	-220.18	-0.03

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	39640.16	4509.20	-0.00	11.75	-254.54	0.28
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	39640.16	3910.58	2257.77	139.88	-220.37	0.52
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	39640.16	2254.60	3905.08	233.54	-126.49	0.61
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	39640.16	0.00	4507.09	267.80	1.57	0.55
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	39640.16	-2254.60	3905.08	233.54	129.62	0.33
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	39640.16	-3910.58	2257.77	139.88	223.50	0.03
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	39640.16	-4509.20	-0.00	11.74	257.68	-0.28
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	39640.16	-3903.25	-2253.54	-116.28	223.33	-0.52
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	39640.16	-2254.60	-3905.08	-210.06	129.63	-0.61
Dead+Wind 0 deg - Service	13281.32	-0.00	-3740.64	-208.10	0.93	-0.15
Dead+Wind 30 deg - Service	13281.32	1863.87	-3228.31	-179.45	-104.77	0.06
Dead+Wind 60 deg - Service	13281.32	3224.58	-1861.71	-102.01	-182.05	0.25
Dead+Wind 90 deg - Service	13281.32	3727.73	-0.00	3.63	-210.47	0.37
Dead+Wind 120 deg - Service	13281.32	3239.49	1870.32	109.50	-182.43	0.40
Dead+Wind 150 deg - Service	13281.32	1863.87	3228.31	186.72	-104.77	0.31
Dead+Wind 180 deg - Service	13281.32	-0.00	3723.43	214.93	0.93	0.15
Dead+Wind 210 deg - Service	13281.32	-1863.87	3228.31	186.72	106.64	-0.06
Dead+Wind 240 deg - Service	13281.32	-3239.49	1870.32	109.50	184.30	-0.25
Dead+Wind 270 deg - Service	13281.32	-3727.73	-0.00	3.63	212.34	-0.37
Dead+Wind 300 deg - Service	13281.32	-3224.58	-1861.71	-102.01	183.92	-0.40
Dead+Wind 330 deg - Service	13281.32	-1863.87	-3228.31	-179.45	106.64	-0.31

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-13281.32	-0.00	0.00	13281.32	-0.00	0.000%
2	-0.00	-15937.59	-15593.10	-0.00	15937.59	15593.10	0.000%
3	-0.00	-11953.19	-15593.10	-0.00	11953.19	15593.10	0.000%
4	7769.55	-15937.59	-13457.26	-7769.55	15937.59	13457.26	0.000%
5	7769.55	-11953.19	-13457.26	-7769.55	11953.19	13457.26	0.000%
6	13441.68	-15937.59	-7760.56	-13441.68	15937.59	7760.56	0.000%
7	13441.68	-11953.19	-7760.56	-13441.68	11953.19	7760.56	0.000%
8	15539.11	-15937.59	0.00	-15539.11	15937.59	-0.00	0.000%
9	15539.11	-11953.19	0.00	-15539.11	11953.19	-0.00	0.000%
10	13504.02	-15937.59	7796.55	-13504.02	15937.59	-7796.55	0.000%
11	13504.02	-11953.19	7796.55	-13504.02	11953.19	-7796.55	0.000%
12	7769.55	-15937.59	13457.26	-7769.55	15937.59	-13457.26	0.000%
13	7769.55	-11953.19	13457.26	-7769.55	11953.19	-13457.26	0.000%
14	0.00	-15937.59	15521.11	-0.00	15937.59	-15521.11	0.000%
15	0.00	-11953.19	15521.11	-0.00	11953.19	-15521.11	0.000%
16	-7769.55	-15937.59	13457.26	7769.55	15937.59	-13457.26	0.000%
17	-7769.55	-11953.19	13457.26	7769.55	11953.19	-13457.26	0.000%
18	-13504.02	-15937.59	7796.55	13504.02	15937.59	-7796.55	0.000%
19	-13504.02	-11953.19	7796.55	13504.02	11953.19	-7796.55	0.000%
20	-15539.11	-15937.59	-0.00	15539.11	15937.59	-0.00	0.000%
21	-15539.11	-11953.19	-0.00	15539.11	11953.19	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
22	-13441.68	-15937.59	-7760.56	13441.68	15937.59	7760.56	0.000%
23	-13441.68	-11953.19	-7760.56	13441.68	11953.19	7760.56	0.000%
24	-7769.55	-15937.59	-13457.26	7769.55	15937.59	13457.26	0.000%
25	-7769.55	-11953.19	-13457.26	7769.55	11953.19	13457.26	0.000%
26	0.00	-39640.16	-0.00	-0.00	39640.16	0.00	0.000%
27	0.00	-39640.16	-4515.54	-0.00	39640.16	4515.54	0.000%
28	2254.60	-39640.16	-3905.08	-2254.60	39640.16	3905.08	0.000%
29	3903.25	-39640.16	-2253.54	-3903.25	39640.16	2253.54	0.000%
30	4509.20	-39640.16	0.00	-4509.20	39640.16	0.00	0.000%
31	3910.58	-39640.16	2257.77	-3910.58	39640.16	-2257.77	0.000%
32	2254.60	-39640.16	3905.08	-2254.60	39640.16	-3905.08	0.000%
33	-0.00	-39640.16	4507.09	-0.00	39640.16	-4507.09	0.000%
34	-2254.60	-39640.16	3905.08	2254.60	39640.16	-3905.08	0.000%
35	-3910.58	-39640.16	2257.77	3910.58	39640.16	-2257.77	0.000%
36	-4509.20	-39640.16	-0.00	4509.20	39640.16	0.00	0.000%
37	-3903.25	-39640.16	-2253.54	3903.25	39640.16	2253.54	0.000%
38	-2254.60	-39640.16	-3905.08	2254.60	39640.16	3905.08	0.000%
39	0.00	-13281.32	-3740.64	0.00	13281.32	3740.64	0.000%
40	1863.87	-13281.32	-3228.31	-1863.87	13281.32	3228.31	0.000%
41	3224.58	-13281.32	-1861.71	-3224.58	13281.32	1861.71	0.000%
42	3727.73	-13281.32	0.00	-3727.73	13281.32	0.00	0.000%
43	3239.49	-13281.32	1870.32	-3239.49	13281.32	-1870.32	0.000%
44	1863.87	-13281.32	3228.31	-1863.87	13281.32	-3228.31	0.000%
45	-0.00	-13281.32	3723.43	0.00	13281.32	-3723.43	0.000%
46	-1863.87	-13281.32	3228.31	1863.87	13281.32	-3228.31	0.000%
47	-3239.49	-13281.32	1870.32	3239.49	13281.32	-1870.32	0.000%
48	-3727.73	-13281.32	-0.00	3727.73	13281.32	0.00	0.000%
49	-3224.58	-13281.32	-1861.71	3224.58	13281.32	1861.71	0.000%
50	-1863.87	-13281.32	-3228.31	1863.87	13281.32	3228.31	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00002329
3	Yes	6	0.00000001	0.00002343
4	Yes	6	0.00000001	0.00005656
5	Yes	6	0.00000001	0.00005852
6	Yes	6	0.00000001	0.00006136
7	Yes	6	0.00000001	0.00006356
8	Yes	5	0.00000001	0.00093659
9	Yes	5	0.00000001	0.00096204
10	Yes	6	0.00000001	0.00004690
11	Yes	6	0.00000001	0.00005099
12	Yes	6	0.00000001	0.00004274
13	Yes	6	0.00000001	0.00004710
14	Yes	5	0.00000001	0.00079587
15	Yes	5	0.00000001	0.00085495
16	Yes	6	0.00000001	0.00005008
17	Yes	6	0.00000001	0.00005503
18	Yes	6	0.00000001	0.00005111
19	Yes	6	0.00000001	0.00005546
20	Yes	5	0.00000001	0.00091508
21	Yes	5	0.00000001	0.00094555
22	Yes	6	0.00000001	0.00006585

23	Yes	6	0.00000001	0.00006829
24	Yes	6	0.00000001	0.00006478
25	Yes	6	0.00000001	0.00006721
26	Yes	4	0.00000001	0.00005656
27	Yes	5	0.00000001	0.00004127
28	Yes	5	0.00000001	0.00007013
29	Yes	5	0.00000001	0.00007021
30	Yes	4	0.00000001	0.00092118
31	Yes	5	0.00000001	0.00006146
32	Yes	5	0.00000001	0.00005545
33	Yes	4	0.00000001	0.00028624
34	Yes	5	0.00000001	0.00006073
35	Yes	5	0.00000001	0.00006244
36	Yes	5	0.00000001	0.00003278
37	Yes	5	0.00000001	0.00007251
38	Yes	5	0.00000001	0.00007778
39	Yes	4	0.00000001	0.00083153
40	Yes	5	0.00000001	0.00000001
41	Yes	5	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00068166
43	Yes	5	0.00000001	0.00000001
44	Yes	5	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00049178
46	Yes	5	0.00000001	0.00000001
47	Yes	5	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00065582
49	Yes	5	0.00000001	0.00000001
50	Yes	5	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	90 - 80	5.337	48	0.7338	0.0374
T1	80 - 60	4.057	46	0.3973	0.0121
T2	60 - 40	2.427	46	0.3477	0.0176
T3	40 - 37.4479	1.130	46	0.2481	0.0124
T4	37.4479 - 34.9792	0.997	46	0.2347	0.0115
T5	34.9792 - 32.5104	0.876	46	0.2210	0.0107
T6	32.5104 - 30.0417	0.762	46	0.2068	0.0100
T7	30.0417 - 27.5729	0.655	46	0.1919	0.0092
T8	27.5729 - 25.1042	0.556	46	0.1765	0.0085
T9	25.1042 - 22.6354	0.466	46	0.1605	0.0077
T10	22.6354 - 20	0.383	46	0.1440	0.0070
T11	20 - 17.4479	0.305	46	0.1258	0.0061
T12	17.4479 - 14.9792	0.237	46	0.1111	0.0053
T13	14.9792 - 12.5104	0.179	46	0.0965	0.0045
T14	12.5104 - 10.0417	0.129	46	0.0814	0.0038
T15	10.0417 - 7.57292	0.087	46	0.0660	0.0030
T16	7.57292 - 5.10417	0.053	46	0.0503	0.0023
T17	5.10417 - 2.63542	0.027	46	0.0342	0.0016
T18	2.63542 - 0	0.010	47	0.0178	0.0009

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	48	5.337	0.7338	0.0374	3511
85.00	10' Omni	46	4.657	0.5334	0.0194	3511
83.00	7' Whip	46	4.407	0.4646	0.0145	2538
78.00	7770	46	3.844	0.3702	0.0124	2049
73.00	2' dish	45	3.380	0.3373	0.0142	2938
65.00	7' Whip	46	2.771	0.3413	0.0169	12770
55.00	4 ' Side Arm	46	2.083	0.3369	0.0172	42959

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 80	21.934	18	2.8023	0.1680
T1	80 - 60	16.635	16	1.6255	0.0519
T2	60 - 40	9.968	16	1.4229	0.0743
T3	40 - 37.4479	4.652	16	1.0186	0.0524
T4	37.4479 - 34.9792	4.104	16	0.9639	0.0486
T5	34.9792 - 32.5104	3.607	16	0.9080	0.0454
T6	32.5104 - 30.0417	3.138	16	0.8496	0.0422
T7	30.0417 - 27.5729	2.699	16	0.7888	0.0390
T8	27.5729 - 25.1042	2.293	18	0.7255	0.0358
T9	25.1042 - 22.6354	1.920	18	0.6600	0.0326
T10	22.6354 - 20	1.581	18	0.5923	0.0295
T11	20 - 17.4479	1.256	18	0.5177	0.0257
T12	17.4479 - 14.9792	0.977	18	0.4573	0.0222
T13	14.9792 - 12.5104	0.740	18	0.3970	0.0191
T14	12.5104 - 10.0417	0.535	18	0.3352	0.0160
T15	10.0417 - 7.57292	0.361	18	0.2719	0.0129
T16	7.57292 - 5.10417	0.221	18	0.2072	0.0098
T17	5.10417 - 2.63542	0.114	18	0.1410	0.0067
T18	2.63542 - 0	0.041	18	0.0735	0.0037

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	18	21.934	2.8023	0.1680	1069
85.00	10' Omni	18	19.152	2.1253	0.0859	1069
83.00	7' Whip	18	18.097	1.8908	0.0607	772
78.00	7770	16	15.753	1.5066	0.0544	620
73.00	2' dish	16	13.840	1.3615	0.0625	874
65.00	7' Whip	16	11.362	1.3880	0.0727	3222
55.00	4 ' Side Arm	16	8.563	1.3825	0.0733	8082

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	90 - 80 (1)	P4x.237	10.00	0.00	0.0	3.1741	-258.96	99982.50	0.003
T1	80 - 60 (374)	P4x.237	10.00	0.00	79.5 K=1.00	3.1741	-362.07	72352.60	0.005

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	90 - 80 (1)	P4x.237	4.31	11.32	0.380	0.00	11.32	0.000
T1	80 - 60 (374)	P4x.237	3.92	11.32	0.347	0.00	11.32	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	90 - 80 (1)	P4x.237	625.40	49991.30	0.013	0.10	16.88	0.006
T1	80 - 60 (374)	P4x.237	394.39	49991.30	0.008	0.00	16.88	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	90 - 80 (1)	0.003	0.380	0.000	0.013	0.006	0.383 ✔	1.000	4.8.2 ✔
T1	80 - 60 (374)	0.005	0.347	0.000	0.008	0.000	0.352 ✔	1.000	4.8.2 ✔

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 $\frac{P_u}{\phi P_n}$

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	80 - 60	1 1/2	20.00	2.47	79.0 K=1.00	1.7672	-41519.30	50385.50	0.824 [1]
T2	60 - 40	2	20.00	2.47	59.3 K=1.00	3.1416	-97077.90	109361.00	0.888 [1]
T3	40 - 37.4479	2 1/4	2.55	2.47	52.7 K=1.00	3.9761	-104383.00	146073.00	0.715 [1]
T4	37.4479 - 34.9792	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-111586.00	146073.00	0.764 [1]
T5	34.9792 - 32.5104	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-118267.00	146073.00	0.810 [1]
T6	32.5104 - 30.0417	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-125022.00	146073.00	0.856 [1]
T7	30.0417 - 27.5729	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-131740.00	146073.00	0.902 [1]
T8	27.5729 - 25.1042	2 1/4	2.47	2.47	52.7 K=1.00	3.9761	-138442.00	146073.00	0.948 [1]
T9	25.1042 - 22.6354	2 1/4	2.47	1.24	26.5 K=1.00	3.9761	-144998.00	169953.00	0.853 [1]
T10	22.6354 - 20	2 1/4	2.64	1.24	26.5 K=1.00	3.9761	-151516.00	169963.00	0.891 [1]
T11	20 - 17.4479	2 1/2	2.55	2.47	47.4 K=1.00	4.9087	-159200.00	187423.00	0.849 [1]
T12	17.4479 - 14.9792	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-166165.00	187423.00	0.887 [1]
T13	14.9792 - 12.5104	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-172717.00	187423.00	0.922 [1]
T14	12.5104 - 10.0417	2 1/2	2.47	2.47	47.4 K=1.00	4.9087	-179307.00	187423.00	0.957 [1]
T15	10.0417 - 7.57292	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-185658.00	211889.00	0.876 [1]
T16	7.57292 - 5.10417	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-192142.00	211891.00	0.907 [1]
T17	5.10417 - 2.63542	2 1/2	2.47	1.24	23.9 K=1.00	4.9087	-198716.00	211892.00	0.938 [1]
T18	2.63542 - 0	2 1/2	2.64	1.24	23.8 K=1.00	4.9087	-205034.00	211901.00	0.968 [1]

[1] $P_u / \phi P_n$ controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 37.4479	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	37.4479 - 34.9792	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T5	34.9792 - 32.5104	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T6	32.5104 - 30.0417	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T7	30.0417 - 27.5729	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T8	27.5729 -	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T9	25.1042 25.1042 - 22.6354	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T10	22.6354 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T11	20 - 17.4479	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	17.4479 - 14.9792	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	14.9792 - 12.5104	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T14	12.5104 - 10.0417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T15	10.0417 - 7.57292	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T16	7.57292 - 5.10417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T17	5.10417 - 2.63542	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T18	2.63542 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.824	0.000	0.000	0.824 [1] ✔	1.000	4.8.1 ✔
T2	60 - 40	2	0.888	0.000	0.000	0.888 [1] ✔	1.000	4.8.1 ✔
T3	40 - 37.4479	2 1/4	0.715	0.000	0.000	0.715 [1] ✔	1.000	4.8.1 ✔
T4	37.4479 - 34.9792	2 1/4	0.764	0.000	0.000	0.764 [1] ✔	1.000	4.8.1 ✔
T5	34.9792 - 32.5104	2 1/4	0.810	0.000	0.000	0.810 [1] ✔	1.000	4.8.1 ✔
T6	32.5104 - 30.0417	2 1/4	0.856	0.000	0.000	0.856 [1] ✔	1.000	4.8.1 ✔
T7	30.0417 - 27.5729	2 1/4	0.902	0.000	0.000	0.902 [1] ✔	1.000	4.8.1 ✔
T8	27.5729 - 25.1042	2 1/4	0.948	0.000	0.000	0.948 [1] ✔	1.000	4.8.1 ✔
T9	25.1042 - 22.6354	2 1/4	0.853	0.000	0.000	0.853 [1] ✔	1.000	4.8.1 ✔
T10	22.6354 - 20	2 1/4	0.891	0.000	0.000	0.891 [1] ✔	1.000	4.8.1 ✔
T11	20 - 17.4479	2 1/2	0.849	0.000	0.000	0.849 [1] ✔	1.000	4.8.1 ✔
T12	17.4479 - 14.9792	2 1/2	0.887	0.000	0.000	0.887 [1] ✔	1.000	4.8.1 ✔
T13	14.9792 - 12.5104	2 1/2	0.922	0.000	0.000	0.922 [1] ✔	1.000	4.8.1 ✔
T14	12.5104 - 10.0417	2 1/2	0.957	0.000	0.000	0.957 [1] ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T15	10.0417 - 7.57292	2 1/2	0.876	0.000	0.000	0.876 [1] ✔	1.000	4.8.1 ✔
T16	7.57292 - 5.10417	2 1/2	0.907	0.000	0.000	0.907 [1] ✔	1.000	4.8.1 ✔
T17	5.10417 - 2.63542	2 1/2	0.938	0.000	0.000	0.938 [1] ✔	1.000	4.8.1 ✔
T18	2.63542 - 0	2 1/2	0.968	0.000	0.000	0.968 [1] ✔	1.000	4.8.1 ✔

[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	80 - 60	3/4	4.28	2.14	123.4 K=0.90	0.4418	-3873.26	6559.28	0.591 [1] ✔
T2	60 - 40	7/8	4.67	2.35	116.2 K=0.90	0.6013	-4320.79	10061.10	0.429 [1] ✔
T3	40 - 37.4479	7/8	4.73	2.38	117.6 K=0.90	0.6013	-4416.43	9824.43	0.450 [1] ✔
T4	37.4479 - 34.9792	7/8	4.78	2.41	118.9 K=0.90	0.6013	-3937.33	9607.05	0.410 [1] ✔
T5	34.9792 - 32.5104	7/8	4.83	2.44	120.2 K=0.90	0.6013	-4082.85	9397.22	0.434 [1] ✔
T6	32.5104 - 30.0417	7/8	4.89	2.46	121.6 K=0.90	0.6013	-4107.70	9193.38	0.447 [1] ✔
T7	30.0417 - 27.5729	7/8	4.94	2.49	122.9 K=0.90	0.6013	-4133.79	8995.35	0.460 [1] ✔
T8	27.5729 - 25.1042	7/8	5.00	2.52	124.2 K=0.90	0.6013	-4225.48	8802.93	0.480 [1] ✔
T9	25.1042 - 22.6354	7/8	5.05	2.54	125.6 K=0.90	0.6013	-4485.73	8615.97	0.521 [1] ✔
T10	22.6354 - 20	7/8	5.10	2.57	126.8 K=0.90	0.6013	-5155.92	8447.37	0.610 [1] ✔
T11	20 - 17.4479	7/8	5.16	2.60	128.3 K=0.90	0.6013	-4545.52	8258.54	0.550 [1] ✔
T12	17.4479 - 14.9792	7/8	5.22	2.63	129.6 K=0.90	0.6013	-4223.14	8086.03	0.522 [1] ✔
T13	14.9792 - 12.5104	7/8	5.27	2.65	131.0 K=0.90	0.6013	-4280.10	7919.16	0.540 [1] ✔
T14	12.5104 - 10.0417	7/8	5.33	2.68	132.3 K=0.90	0.6013	-4341.98	7756.93	0.560 [1] ✔
T15	10.0417 - 7.57292	7/8	5.38	2.71	133.7 K=0.90	0.6013	-4682.32	7599.17	0.616 [1] ✔
T16	7.57292 - 5.10417	7/8	5.44	2.74	135.1 K=0.90	0.6013	-4765.12	7445.76	0.640 [1] ✔
T17	5.10417 - 2.63542	7/8	5.49	2.76	136.4 K=0.90	0.6013	-4763.03	7296.54	0.653 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T18	2.63542 - 0	7/8	5.55	2.79	137.7 K=0.90	0.6013	-5704.92	7161.59	0.797 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	156.8 K=0.70	0.4418	-1161.12	4059.38	0.286 [1]
T2	60 - 40	7/8	3.93	3.93	151.1 K=0.70	0.6013	-1790.52	5952.36	0.301 [1]

[1] P_u / ϕP_n controls

Secondary 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 $\frac{P_u}{\phi P_n}$
T9	25.1042 - 22.6354	L2x2x1/4	4.41	4.41	103.4 K=1.19	0.9380	-629.05	17308.60	0.036 [1]
T10	22.6354 - 20	L2x2x1/4	4.47	4.47	104.0 K=1.18	0.9380	-1027.65	17196.20	0.060 [1]
T15	10.0417 - 7.57292	L2x2x1/4	4.78	4.78	107.1 K=1.14	0.9380	-777.90	16614.20	0.047 [1]
T16	7.57292 - 5.10417	L2x2x1/4	4.84	4.84	107.7 K=1.13	0.9380	-960.87	16498.90	0.058 [1]
T17	5.10417 - 2.63542	L2x2x1/4	4.91	4.91	108.3 K=1.12	0.9380	-1011.17	16383.70	0.062 [1]
T18	2.63542 - 0	L2x2x1/4	4.97	4.97	108.9 K=1.11	0.9380	-1434.42	16272.30	0.088 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

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

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	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.50	90.4 K=1.49	2.0900	-3804.16	44025.70	0.086 [1] ✔
T2	60 - 40	7/8	3.50	3.50	134.5 K=0.70	0.6013	-16.60	7511.56	0.002 [1] ✔
T3	40 - 37.4479	1	4.00	4.00	134.5 K=0.70	0.7854	-593.37	9812.69	0.060 [1] ✔
T4	37.4479 - 34.9792	7/8	4.06	4.06	156.0 K=0.70	0.6013	-1684.34	5582.09	0.302 [1] ✔
T5	34.9792 - 32.5104	7/8	4.13	4.13	158.4 K=0.70	0.6013	-1542.88	5414.21	0.285 [1] ✔
T6	32.5104 - 30.0417	7/8	4.19	4.19	160.8 K=0.70	0.6013	-1625.91	5253.80	0.309 [1] ✔
T7	30.0417 - 27.5729	7/8	4.25	4.25	163.2 K=0.70	0.6013	-1662.79	5100.42	0.326 [1] ✔
T8	27.5729 - 25.1042	7/8	4.31	4.31	165.6 K=0.70	0.6013	-1757.95	4953.65	0.355 [1] ✔
T9	25.1042 - 22.6354	7/8	4.38	4.38	168.0 K=0.70	0.6013	-1670.40	4813.13	0.347 [1] ✔
T10	22.6354 - 20	7/8	4.44	4.44	170.4 K=0.70	0.6013	-1756.56	4678.50	0.375 [1] ✔
T11	20 - 17.4479	1	4.50	4.50	151.3 K=0.70	0.7854	-844.52	7754.12	0.109 [1] ✔
T12	17.4479 - 14.9792	7/8	4.56	4.56	175.2 K=0.70	0.6013	-1669.96	4425.66	0.377 [1] ✔
T13	14.9792 - 12.5104	7/8	4.63	4.63	177.6 K=0.70	0.6013	-1528.93	4306.85	0.355 [1] ✔
T14	12.5104 - 10.0417	7/8	4.69	4.69	180.0 K=0.70	0.6013	-1617.99	4192.77	0.386 [1] ✔
T15	10.0417 - 7.57292	7/8	4.75	4.75	182.4 K=0.70	0.6013	-1521.37	4083.16	0.373 [1] ✔
T16	7.57292 - 5.10417	7/8	4.81	4.81	184.8 K=0.70	0.6013	-1376.64	3977.79	0.346 [1] ✔
T17	5.10417 - 2.63542	7/8	4.88	4.88	187.2 K=0.70	0.6013	-1360.24	3876.45	0.351 [1] ✔
T18	2.63542 - 0	7/8	4.94	4.94	189.6 K=0.70	0.6013	-1633.45	3778.93	0.432 [1] ✔

[1] P_u / ϕP_n controls

Bottom 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	80 - 60	3/4	3.50	3.50	156.8 K=0.70	0.4418	-1181.75	4059.38	0.291 [1] ✔
T2	60 - 40	7/8	4.00	4.00	153.4 K=0.70	0.6013	-1423.89	5769.90	0.247 [1] ✔
T10	22.6354 - 20	1	4.50	4.50	151.1 K=0.70	0.7854	-1280.47	7774.80	0.165 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T18	2.63542 - 0	1	5.00	5.00	167.9 K=0.70	0.7854	-457.68	6296.48	0.073 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	1 1/2	20.00	0.17	5.3	1.7672	41819.50	79521.60	0.526 [1]
T2	60 - 40	2	20.00	0.17	4.0	3.1416	95443.00	141372.00	0.675 [1]
T3	40 - 37.4479	2 1/4	2.55	2.47	52.7	3.9761	98337.50	178924.00	0.550 [1]
T4	37.4479 - 34.9792	2 1/4	2.47	2.47	52.7	3.9761	105272.00	178924.00	0.588 [1]
T5	34.9792 - 32.5104	2 1/4	2.47	2.47	52.7	3.9761	111729.00	178924.00	0.624 [1]
T6	32.5104 - 30.0417	2 1/4	2.47	2.47	52.7	3.9761	118258.00	178924.00	0.661 [1]
T7	30.0417 - 27.5729	2 1/4	2.47	2.47	52.7	3.9761	124749.00	178924.00	0.697 [1]
T8	27.5729 - 25.1042	2 1/4	2.47	2.47	52.7	3.9761	131217.00	178924.00	0.733 [1]
T9	25.1042 - 22.6354	2 1/4	2.47	1.23	26.1	3.9761	137498.00	178924.00	0.768 [1]
T10	22.6354 - 20	2 1/4	2.64	0.17	3.6	3.9761	148347.00	178924.00	0.829 [1]
T11	20 - 17.4479	2 1/2	2.55	2.47	47.4	4.9087	151144.00	220893.00	0.684 [1]
T12	17.4479 - 14.9792	2 1/2	2.47	2.47	47.4	4.9087	157845.00	220893.00	0.715 [1]
T13	14.9792 - 12.5104	2 1/2	2.47	2.47	47.4	4.9087	164147.00	220893.00	0.743 [1]
T14	12.5104 - 10.0417	2 1/2	2.47	2.47	47.4	4.9087	170479.00	220893.00	0.772 [1]
T15	10.0417 - 7.57292	2 1/2	2.47	1.23	23.5	4.9087	176539.00	220893.00	0.799 [1]
T16	7.57292 - 5.10417	2 1/2	2.47	1.23	23.5	4.9087	182735.00	220893.00	0.827 [1]
T17	5.10417 - 2.63542	2 1/2	2.47	1.23	23.6	4.9087	189016.00	220893.00	0.856 [1]
T18	2.63542 - 0	2 1/2	2.64	0.17	3.2	4.9087	199728.00	220893.00	0.904 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 37.4479	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	37.4479 - 34.9792	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T5	34.9792 - 32.5104	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T6	32.5104 - 30.0417	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T7	30.0417 - 27.5729	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T8	27.5729 - 25.1042	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T9	25.1042 - 22.6354	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T10	22.6354 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T11	20 - 17.4479	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	17.4479 - 14.9792	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	14.9792 - 12.5104	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T14	12.5104 - 10.0417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T15	10.0417 - 7.57292	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T16	7.57292 - 5.10417	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T17	5.10417 - 2.63542	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T18	2.63542 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.526	0.000	0.000	0.526 [1] ✔	1.000	4.8.1 ✔
T2	60 - 40	2	0.675	0.000	0.000	0.675 [1] ✔	1.000	4.8.1 ✔
T3	40 - 37.4479	2 1/4	0.550	0.000	0.000	0.550 [1] ✔	1.000	4.8.1 ✔
T4	37.4479 - 34.9792	2 1/4	0.588	0.000	0.000	0.588 [1] ✔	1.000	4.8.1 ✔
T5	34.9792 - 32.5104	2 1/4	0.624	0.000	0.000	0.624 [1] ✔	1.000	4.8.1 ✔
T6	32.5104 - 30.0417	2 1/4	0.661	0.000	0.000	0.661 [1] ✔	1.000	4.8.1 ✔
T7	30.0417 - 27.5729	2 1/4	0.697	0.000	0.000	0.697 [1] ✔	1.000	4.8.1 ✔
T8	27.5729 - 25.1042	2 1/4	0.733	0.000	0.000	0.733 [1] ✔	1.000	4.8.1 ✔
T9	25.1042 - 22.6354	2 1/4	0.768	0.000	0.000	0.768 [1] ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T10	22.6354 - 20	2 1/4	0.829	0.000	0.000	0.829 [1] ✔	1.000	4.8.1 ✔
T11	20 - 17.4479	2 1/2	0.684	0.000	0.000	0.684 [1] ✔	1.000	4.8.1 ✔
T12	17.4479 - 14.9792	2 1/2	0.715	0.000	0.000	0.715 [1] ✔	1.000	4.8.1 ✔
T13	14.9792 - 12.5104	2 1/2	0.743	0.000	0.000	0.743 [1] ✔	1.000	4.8.1 ✔
T14	12.5104 - 10.0417	2 1/2	0.772	0.000	0.000	0.772 [1] ✔	1.000	4.8.1 ✔
T15	10.0417 - 7.57292	2 1/2	0.799	0.000	0.000	0.799 [1] ✔	1.000	4.8.1 ✔
T16	7.57292 - 5.10417	2 1/2	0.827	0.000	0.000	0.827 [1] ✔	1.000	4.8.1 ✔
T17	5.10417 - 2.63542	2 1/2	0.856	0.000	0.000	0.856 [1] ✔	1.000	4.8.1 ✔
T18	2.63542 - 0	2 1/2	0.904	0.000	0.000	0.904 [1] ✔	1.000	4.8.1 ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	4.28	2.14	137.1	0.4418	3701.42	19880.40	0.186 [1] ✔
T2	60 - 40	7/8	4.67	2.35	129.1	0.6013	4101.74	27059.40	0.152 [1] ✔
T3	40 - 37.4479	7/8	4.73	2.38	130.7	0.6013	4199.47	27059.40	0.155 [1] ✔
T4	37.4479 - 34.9792	7/8	4.78	2.41	132.1	0.6013	3755.98	27059.40	0.139 [1] ✔
T5	34.9792 - 32.5104	7/8	4.83	2.44	133.6	0.6013	3897.52	27059.40	0.144 [1] ✔
T6	32.5104 - 30.0417	7/8	4.89	2.46	135.1	0.6013	3917.46	27059.40	0.145 [1] ✔
T7	30.0417 - 27.5729	7/8	4.94	2.49	136.5	0.6013	3939.71	27059.40	0.146 [1] ✔
T8	27.5729 - 25.1042	7/8	5.00	2.52	138.0	0.6013	4031.18	27059.40	0.149 [1] ✔
T9	25.1042 - 22.6354	7/8	5.05	2.54	139.5	0.6013	4302.69	27059.40	0.159 [1] ✔
T10	22.6354 - 20	7/8	5.10	2.57	140.9	0.6013	4926.43	27059.40	0.182 [1] ✔
T11	20 - 17.4479	7/8	5.16	2.60	142.5	0.6013	4344.94	27059.40	0.161 [1] ✔
T12	17.4479 - 14.9792	7/8	5.22	2.63	144.0	0.6013	4018.29	27059.40	0.148 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	14.9792 - 12.5104	7/8	5.27	2.65	145.5	0.6013	4072.42	27059.40	0.150 [1]
T14	12.5104 - 10.0417	7/8	5.33	2.68	147.0	0.6013	4140.75	27059.40	0.153 [1]
T15	10.0417 - 7.57292	7/8	5.38	2.71	148.6	0.6013	4473.13	27059.40	0.165 [1]
T16	7.57292 - 5.10417	7/8	5.44	2.74	150.1	0.6013	4574.85	27059.40	0.169 [1]
T17	5.10417 - 2.63542	7/8	5.49	2.76	151.6	0.6013	4555.08	27059.40	0.168 [1]
T18	2.63542 - 0	7/8	5.55	2.79	153.0	0.6013	5443.55	27059.40	0.201 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	224.0	0.4418	1299.66	19880.40	0.065 [1]
T2	60 - 40	7/8	3.93	3.93	215.8	0.6013	2060.11	27059.40	0.076 [1]

[1] P_u / ϕP_n controls

Secondary 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 $\frac{P_u}{\phi P_n}$
T9	25.1042 - 22.6354	L2x2x1/4	4.41	4.41	86.8	0.9380	521.22	30391.20	0.017 [1]
T10	22.6354 - 20	L2x2x1/4	4.47	4.47	88.0	0.9380	926.74	30391.20	0.030 [1]
T15	10.0417 - 7.57292	L2x2x1/4	4.78	4.78	94.2	0.9380	657.32	30391.20	0.022 [1]
T16	7.57292 - 5.10417	L2x2x1/4	4.84	4.84	95.4	0.9380	846.50	30391.20	0.028 [1]
T17	5.10417 - 2.63542	L2x2x1/4	4.91	4.91	96.7	0.9380	928.33	30391.20	0.031 [1]
T18	2.63542 - 0	L2x2x1/4	4.97	4.97	97.9	0.9380	1359.94	30391.20	0.045 [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	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.50	38.9	2.0900	3403.54	67716.00	0.050 [1] ✔
T2	60 - 40	7/8	3.50	3.50	192.1	0.6013	168.95	27059.40	0.006 [1] ✔
T3	40 - 37.4479	1	4.00	4.00	192.1	0.7854	727.73	35342.90	0.021 [1] ✔
T4	37.4479 - 34.9792	7/8	4.06	4.06	222.9	0.6013	1915.53	27059.40	0.071 [1] ✔
T5	34.9792 - 32.5104	7/8	4.13	4.13	226.3	0.6013	1747.90	27059.40	0.065 [1] ✔
T6	32.5104 - 30.0417	7/8	4.19	4.19	229.7	0.6013	1842.72	27059.40	0.068 [1] ✔
T7	30.0417 - 27.5729	7/8	4.25	4.25	233.1	0.6013	1880.52	27059.40	0.069 [1] ✔
T8	27.5729 - 25.1042	7/8	4.31	4.31	236.6	0.6013	1989.83	27059.40	0.074 [1] ✔
T9	25.1042 - 22.6354	7/8	4.38	4.38	240.0	0.6013	1877.02	27059.40	0.069 [1] ✔
T10	22.6354 - 20	7/8	4.44	4.44	243.4	0.6013	1996.89	27059.40	0.074 [1] ✔
T11	20 - 17.4479	1	4.50	4.50	216.1	0.7854	975.85	35342.90	0.028 [1] ✔
T12	17.4479 - 14.9792	7/8	4.56	4.56	250.3	0.6013	1897.39	27059.40	0.070 [1] ✔
T13	14.9792 - 12.5104	7/8	4.63	4.63	253.7	0.6013	1722.92	27059.40	0.064 [1] ✔
T14	12.5104 - 10.0417	7/8	4.69	4.69	257.1	0.6013	1831.74	27059.40	0.068 [1] ✔
T15	10.0417 - 7.57292	7/8	4.75	4.75	260.6	0.6013	1712.57	27059.40	0.063 [1] ✔
T16	7.57292 - 5.10417	7/8	4.81	4.81	264.0	0.6013	1557.80	27059.40	0.058 [1] ✔
T17	5.10417 - 2.63542	7/8	4.88	4.88	267.4	0.6013	1530.45	27059.40	0.057 [1] ✔
T18	2.63542 - 0	7/8	4.94	4.94	270.9	0.6013	1868.18	27059.40	0.069 [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 $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.50	224.0	0.4418	1305.89	19880.40	0.066 [1]
T2	60 - 40	7/8	4.00	4.00	219.2	0.6013	1560.99	27059.40	0.058 [1]
T10	22.6354 - 20	1	4.50	4.50	215.8	0.7854	1408.31	35342.90	0.040 [1]
T18	2.63542 - 0	1	5.00	5.00	239.8	0.7854	4725.71	35342.90	0.134 [1]

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	90 - 80	Pole	P4x.237	1	-258.96	99982.50	38.3	Pass
T1	80 - 60	Leg	1 1/2	2	-41519.30	50385.50	82.4	Pass
T2	60 - 40	Leg	2	80	-97077.90	109361.00	88.8	Pass
T3	40 - 37.4479	Leg	2 1/4	158	-104383.00	146073.00	71.5	Pass
T4	37.4479 - 34.9792	Leg	2 1/4	170	-111586.00	146073.00	76.4	Pass
T5	34.9792 - 32.5104	Leg	2 1/4	182	-118267.00	146073.00	81.0	Pass
T6	32.5104 - 30.0417	Leg	2 1/4	194	-125022.00	146073.00	85.6	Pass
T7	30.0417 - 27.5729	Leg	2 1/4	206	-131740.00	146073.00	90.2	Pass
T8	27.5729 - 25.1042	Leg	2 1/4	218	-138442.00	146073.00	94.8	Pass
T9	25.1042 - 22.6354	Leg	2 1/4	230	-144998.00	169953.00	85.3	Pass
T10	22.6354 - 20	Leg	2 1/4	245	-151516.00	169963.00	89.1	Pass
T11	20 - 17.4479	Leg	2 1/2	263	-159200.00	187423.00	84.9	Pass
T12	17.4479 - 14.9792	Leg	2 1/2	275	-166165.00	187423.00	88.7	Pass
T13	14.9792 - 12.5104	Leg	2 1/2	287	-172717.00	187423.00	92.2	Pass
T14	12.5104 - 10.0417	Leg	2 1/2	299	-179307.00	187423.00	95.7	Pass
T15	10.0417 - 7.57292	Leg	2 1/2	311	-185658.00	211889.00	87.6	Pass
T16	7.57292 - 5.10417	Leg	2 1/2	326	-192142.00	211891.00	90.7	Pass
T17	5.10417 - 2.63542	Leg	2 1/2	341	-198716.00	211892.00	93.8	Pass
T18	2.63542 - 0	Leg	2 1/2	356	-205034.00	211901.00	96.8	Pass
T1	80 - 60	Diagonal	3/4	16	-3873.26	6559.28	59.1	Pass
T2	60 - 40	Diagonal	7/8	90	-4320.79	10061.10	42.9	Pass
T3	40 - 37.4479	Diagonal	7/8	165	-4416.43	9824.43	45.0	Pass
T4	37.4479 - 34.9792	Diagonal	7/8	177	-3937.33	9607.05	41.0	Pass
T5	34.9792 - 32.5104	Diagonal	7/8	189	-4082.85	9397.22	43.4	Pass
T6	32.5104 - 30.0417	Diagonal	7/8	201	-4107.70	9193.38	44.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T7	30.0417 - 27.5729	Diagonal	7/8	213	-4133.79	8995.35	46.0	Pass
T8	27.5729 - 25.1042	Diagonal	7/8	225	-4225.48	8802.93	48.0	Pass
T9	25.1042 - 22.6354	Diagonal	7/8	237	-4485.73	8615.97	52.1	Pass
T10	22.6354 - 20	Diagonal	7/8	255	-5155.92	8447.37	61.0	Pass
T11	20 - 17.4479	Diagonal	7/8	270	-4545.52	8258.54	55.0	Pass
T12	17.4479 - 14.9792	Diagonal	7/8	282	-4223.14	8086.03	52.2	Pass
T13	14.9792 - 12.5104	Diagonal	7/8	294	-4280.10	7919.16	54.0	Pass
T14	12.5104 - 10.0417	Diagonal	7/8	306	-4341.98	7756.93	56.0	Pass
T15	10.0417 - 7.57292	Diagonal	7/8	318	-4682.32	7599.17	61.6	Pass
T16	7.57292 - 5.10417	Diagonal	7/8	333	-4765.12	7445.76	64.0	Pass
T17	5.10417 - 2.63542	Diagonal	7/8	348	-4763.03	7296.54	65.3	Pass
T18	2.63542 - 0	Diagonal	7/8	366	-5704.92	7161.59	79.7	Pass
T1	80 - 60	Horizontal	3/4	46	-1161.12	4059.38	28.6	Pass
T2	60 - 40	Horizontal	7/8	96	-1790.52	5952.36	30.1	Pass
T9	25.1042 - 22.6354	Secondary Horizontal	L2x2x1/4	243	-629.05	17308.60	3.6	Pass
T10	22.6354 - 20	Secondary Horizontal	L2x2x1/4	260	-1027.65	17196.20	6.0	Pass
T15	10.0417 - 7.57292	Secondary Horizontal	L2x2x1/4	324	-777.90	16614.20	4.7	Pass
T16	7.57292 - 5.10417	Secondary Horizontal	L2x2x1/4	339	-960.87	16498.90	5.8	Pass
T17	5.10417 - 2.63542	Secondary Horizontal	L2x2x1/4	354	-1011.17	16383.70	6.2	Pass
T18	2.63542 - 0	Secondary Horizontal	L2x2x1/4	371	-1434.42	16272.30	8.8	Pass
T1	80 - 60	Top Girt	L3 1/2x3 1/2x5/16	7	-3804.16	44025.70	8.6	Pass
T2	60 - 40	Top Girt	7/8	83	168.95	27059.40	0.6	Pass
T3	40 - 37.4479	Top Girt	1	162	-593.37	9812.69	6.0	Pass
T4	37.4479 - 34.9792	Top Girt	7/8	174	-1684.34	5582.09	30.2	Pass
T5	34.9792 - 32.5104	Top Girt	7/8	186	-1542.88	5414.21	28.5	Pass
T6	32.5104 - 30.0417	Top Girt	7/8	198	-1625.91	5253.80	30.9	Pass
T7	30.0417 - 27.5729	Top Girt	7/8	210	-1662.79	5100.42	32.6	Pass
T8	27.5729 - 25.1042	Top Girt	7/8	222	-1757.95	4953.65	35.5	Pass
T9	25.1042 - 22.6354	Top Girt	7/8	234	-1670.40	4813.13	34.7	Pass
T10	22.6354 - 20	Top Girt	7/8	249	-1756.56	4678.50	37.5	Pass
T11	20 - 17.4479	Top Girt	1	267	-844.52	7754.12	10.9	Pass
T12	17.4479 - 14.9792	Top Girt	7/8	279	-1669.96	4425.66	37.7	Pass
T13	14.9792 - 12.5104	Top Girt	7/8	291	-1528.93	4306.85	35.5	Pass
T14	12.5104 - 10.0417	Top Girt	7/8	303	-1617.99	4192.77	38.6	Pass
T15	10.0417 - 7.57292	Top Girt	7/8	315	-1521.37	4083.16	37.3	Pass
T16	7.57292 - 5.10417	Top Girt	7/8	330	-1376.64	3977.79	34.6	Pass
T17	5.10417 -	Top Girt	7/8	345	-1360.24	3876.45	35.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	2.63542							
T18	2.63542 - 0	Top Girt	7/8	360	-1633.45	3778.93	43.2	Pass
T1	80 - 60	Bottom Girt	3/4	9	-1181.75	4059.38	29.1	Pass
T2	60 - 40	Bottom Girt	7/8	87	-1423.89	5769.90	24.7	Pass
T10	22.6354 - 20	Bottom Girt	1	252	-1280.47	7774.80	16.5	Pass
T18	2.63542 - 0	Bottom Girt	1	363	4725.71	35342.90	13.4	Pass
T1	80 - 60	Pole Socket	P4x.237	374	-362.07	72352.60	35.2	Pass
							Summary	
						Pole (L1)	38.3	Pass
						Leg (T18)	96.8	Pass
						Diagonal (T18)	79.7	Pass
						Horizontal (T2)	30.1	Pass
						Secondary Horizontal (T18)	8.8	Pass
						Top Girt (T18)	43.2	Pass
						Bottom Girt (T1)	29.1	Pass
						Pole Socket (T1)	35.2	Pass
						RATING =	**96.8**	**Pass**

Site Information:

Location: **Wallingford, CT**

Tower Leg Reactions (Factored from TNX):

Overall Reactions:

Download: $P_{overall} := 15.9kip$

Shear: $V_{overall} := 15.6kip$

Moment: $M_{overall} := 886kip \cdot ft$

Corner Reactions:

Compression: $P_c := 209.9kip$

Tension: $P_t := 199.6kip$

Shear: $V_F := 9.2kip$

Soil Parameters:

Ultimate Net Bearing Capacity:	$q_{net} := 10000psf$	(per old SA)
Internal Friction Angle:	$\phi := 30deg$	(per old SA)
Unit Weight of Soil:	$\gamma_{soil} := 100pcf$	(per old SA)
Depth to be neglected:	$L_{gnl} := 2.25ft$	(per old SA)

Material Parameters:

Unit Weight of Concrete:	$\gamma_{conc} := 150pcf$
Concrete Compressive Strength:	$f_c := 3ksi$
Steel Yield Strength:	$f_y := 60ksi$

Strength Reduction Factor:

$\phi_{s\_bearing} := 0.75$	as per 9.4.1 from TIA-222-G code for bearing
$\phi_{s\_friction} := 0.75$	as per 9.4.1 from TIA-222-G code for skin friction resistance
$\phi_{s\_lateral} := 0.75$	as per 9.4.1 from TIA-222-G code for lateral resistance
$\phi_{s\_uplift} := 0.75$	as per 9.4.1 TIA-222-G code for lateral resistance

Foundation Parameters:

Tower Face Width:	$Width_{tower} := 5ft$	
Tower Height:	$Height_{tower} := 90ft$	
Tower Eccentricity from the centriod of mat foundation:	$e_{tower} := 0in$	(Assumed)
Length of Mat:	$L_{mat} := 14ft$	
Width of Mat:	$W_{mat} := 14ft$	
Depth of Mat:	$D_{mat} := 4.5ft$	
Thickness of Mat:	$T_{mat} := 8.25ft$	
Pedestal Diameter:	$D_{ped} := 0ft$	
No. of Pedestals:	$N_{ped} := 0$	
Extension Above Grade:	$E_g := T_{mat} - D_{mat} = 3.8\,ft$	

Reinforcement Parameters:

Typical concrete cover	$cc := 3in$
Vertical rebar size	$d_{bar} := 1$
Tiebar size	$d_{tie} := 1$

Mat Foundation Resist Moment Calculation: (0.9D + 1.6W + 1.6H)

Passive Pressure: $K_p := \tan\left(45\cdot\text{deg} + \frac{\phi}{2}\right)^2$ $K_p = 3$

$P_{pave} := \frac{(L_{gnl})\cdot K_p\cdot\gamma_{soil} + (D_{mat} - L_{gnl})\cdot K_p\cdot\gamma_{soil}}{2}$ $P_{pave} = 0.7\cdot\text{ksf}$

1) Resistance Moment - Concrete Weight:

$Wt_{conc} := L_{mat}\cdot W_{mat}\cdot T_{mat}\cdot\gamma_{conc} + \frac{\pi\cdot D_{ped}^2}{4}\cdot(D_{mat} - D_{mat})\cdot N_{ped}\cdot\gamma_{conc} = 242.5\cdot\text{kip}$

$Arm_{conc} := \frac{L_{mat}}{2} = 7\,\text{ft}$

$ROTM_c := Wt_{conc}\cdot Arm_{conc} = 1697.8\cdot\text{kip}\cdot\text{ft}$

2) Resistance Moment - Soil Weight:

$Wt_{soil} := \left(L_{mat}\cdot W_{mat} - \frac{\pi\cdot D_{ped}^2}{4}\cdot N_{ped}\right)\cdot(D_{mat} - D_{mat})\cdot\gamma_{soil} = 0\cdot\text{kip}$

$Arm_{soil} := \frac{L_{mat}}{2} = 7\,\text{ft}$

$ROTM_s := Wt_{soil}\cdot Arm_{soil} = 0\cdot\text{kip}\cdot\text{ft}$

3) Resistance Moment - Soil Wedge:

$Wt_{soilwedge} := \frac{1}{2}\cdot\tan(\phi)\cdot D_{mat}^2\cdot W_{mat}\cdot\gamma_{soil} = 8.2\cdot\text{kip}$

$Arm_{soilw} := \frac{L_{mat}}{2} + \frac{D_{mat}\cdot\tan(\phi)}{3} = 7.9\,\text{ft}$

$ROTM_{sw} := Wt_{soilwedge}\cdot Arm_{soilw} = 64.4\cdot\text{kip}\cdot\text{ft}$

4) Resistance Moment - Soil Passive Pressure:

$F_{pave} := P_{pave} \cdot (D_{mat} - L_{gnl}) \cdot W_{mat} = 21.3 \cdot kip$

$Arm_{pave} := \frac{D_{mat} - L_{gnl}}{3} + L_{gnl} = 3\ ft$ (estimated)

$ROTM_{pave} := F_{pave} \cdot Arm_{pave} = 63.8 \cdot kip \cdot ft$

5) Resistance Moment - Tower Vertical load

$F_{tower} := P_{overall} = 15.9 \cdot kip$

$Arm_{vert} := \frac{L_{mat}}{2} - e_{tower} = 7\ ft$

$ROTM_{vert} := F_{tower} \cdot Arm_{vert} = 111.3 \cdot kip \cdot ft$

Total Resistance Moment:

$Mr_{total} := 0.9ROTM_c + 0.9ROTM_s + 0.9ROTM_{sw} + 1.6ROTM_{pave} + ROTM_{vert} = 1799.4 \cdot kip \cdot ft$

Mat Foundation Overturning Moment Calculation:

$OTM := M_{overall} = 886\ kip \cdot ft$

Mat Foundation Overturning Moment Check:

Overturning Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } Mr_{total} \geq OTM \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

$Check = \text{"OK"}$

Usage:

$Usage := \frac{OTM}{Mr_{total}}$ $Usage = 49.2 \cdot \%$

Mat Foundation Bearing Check: (0.9D + 1.6W + 1.6H)

Vertical Force:

$F_1 := 0.9Wt_{conc} + 0.9 \cdot Wt_{soil} + 0.9 \cdot Wt_{soilwedge} + F_{tower} = 241.6 \cdot kip$

$e := \frac{L_{mat}}{2} - \frac{OTM}{F_1} = 3.3\,ft$ $\qquad$ $L_{loc} := \frac{L_{mat}}{6} = 2.3\,ft$

$P_{max1} := if\left[e \le L_{loc}, \frac{F_1}{L_{mat} \cdot W_{mat}} \cdot \left[1 + \left(6 \cdot \frac{e}{L_{mat}}\right)\right], 4 \cdot \frac{F_1}{3 \cdot W_{mat} \cdot (L_{mat} - 2 \cdot e)}\right] = 3136.2 \cdot psf$

$F_2 := 0.9Wt_{conc} \cdot \frac{\gamma_{soil}}{\gamma_{conc}}$

$P_2 := \frac{F_2}{L_{mat} \cdot W_{mat}} = 742.5 \cdot psf$

$P_{net} := P_{max1} - P_2 = 2393.7 \cdot psf$

$P_{min1} := if\left[e \le L_{loc}, \frac{F_1}{L_{mat} \cdot W_{mat}} \cdot \left[1 - \left(6 \cdot \frac{e}{L_{mat}}\right)\right], 0\right] = 0 \cdot psf$

Bearing Check:

$Check := \begin{cases} \text{"OK"} & \text{if } \phi_{s\_bearing} \cdot q_{net} \ge P_{net} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$

Check = "OK"

Usage:

$Usage := \frac{P_{net}}{\phi_{s\_bearing} \cdot q_{net}}$ $\qquad$ Usage = 31.9·%

Tower Anchor Bolts Check:

Axial Load on Tower Leg: $P_{up} := P_t = 199.6\,kip$

Axial Load on Tower Leg: $P_{down} := P_c = 209.9\,kip$

Shear Load on Tower Leg under Max. Tension: $V_{sh} := V_F = 9.2\,kip$

$\eta := 0.55$ (TIA 222-G Section 4.9.9, Type c)

$\phi := 0.8$ (TIA 222-G Section 4.9.9)

Anchor Bolts Size: $d_{bolt} := 1.75in$ (Per old SA)

Anchor Bolts Number per leg: $n_{bolt} := 2$

Anchor Bolts Grade: $F_{nt} := 80ksi$ (Assume to be A36 per old SA)

Design Tensile Strength for anchor bolts: $R_{nt} := F_{nt} \cdot 0.75 \cdot \frac{\pi}{4} \cdot \left(d_{bolt}\right)^2 = 144.3 \cdot kip$ (TIA 222-G Section 4.9.6.1)

Anchor Rods Check: (TIA 222-G Section 4.9.9)

$$Test := \begin{cases} \text{"GOOD"} & \text{if } \dfrac{\left(\dfrac{P_{up}}{n_{bolt}} + \dfrac{V_{sh}}{\eta \cdot n_{bolt}}\right)}{\phi \cdot R_{nt}} \le 1 \\ \text{"No Good"} & \text{otherwise} \end{cases}$$

Test = "GOOD"

$$Usage := \frac{\left(\dfrac{P_{up}}{n_{bolt}} + \dfrac{V_{sh}}{\eta \cdot n_{bolt}}\right)}{\phi \cdot R_{nt}} = 93.7 \cdot \%$$

PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
   A. PLAN ENTITLED "MT. TOM WALLINGFORD" PREPARED BY CENTEK ENGINEERING OF BRANFORD, CT LAST REVISED 01/06/17.
   B. LIMITED FIELD OBSERVATION BY MASER CONSULTING ON 05/14/2018.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. THE PROPOSED FACILITY WILL CAUSE AN INSIGNIFICANT OR "DE-MINIMUS" INCREASE IN STORM WATER RUNOFF, THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION.
15. THE TOWER, MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EIA/TIA-222-H AS PER IBC REQUIREMENTS.
16. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
17. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
18. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS.
19. CONTRACTOR SHALL CONTACT STATE SPECIFIC ONE CALL SYSTEM THREE WORKING DAYS PRIOR TO ANY EARTH MOVING ACTIVITIES.

SITE NAME: MT. TOM WALLINGFORD
FA NUMBER: 10035084
SITE NUMBER: CT2168
6C - MRCTB032233
7C - MRCTB032242
5G NR UPGRADE - MRCTB032262
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

VICINITY MAP

CODE COMPLIANCE

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

1. 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC
2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70
3. 2017 NFPA 101
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
5. AMERICAN CONCRETE INSTITUTE
6. TIA-222-G
7. TIA 607 FOR GROUNDING
8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2 LATEST EDITION
9. TELCORDIA GR-1275
10. ANSI T1.311
11. PROPOSED USE: UNMANNED TELECOM FACILITY
12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
13. CONSTRUCTION TYPE: IIB
14. USE GROUP: U

PROJECT INFORMATION

SITE INFORMATION

LATITUDE: 41.4627419° N
LONGITUDE: 72.8418881° W
JURISDICTION: NEW HAVEN COUNTY

APPLICANT/LESSEE

COMPANY: NEW CINGULAR WIRELESS PCS, LLC
ADDRESS: 550 COCHITUATE ROAD
CITY, STATE, ZIP: FRAMINGHAM, MA 01701

STRUCTURE OWNER

COMPANY: TBD
ADDRESS: TBD
CITY, STATE, ZIP: TBD

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DAVID COOPER
E-MAIL: DCOOPER@EMPIRETELECOM.COM

SITE ACQUISITION

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: DAVID COOPER
E-MAIL: DCOOPER@EMPIRETELECOM.COM

ENGINEER

COMPANY: MASER CONSULTING P.A.
ADDRESS: 331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP: RED BANK, NJ 07701-5669
CONTACT: ROBERT ANDREWS
PHONE: (856) 797-0412
E-MAIL: RANDREWS@MASERCONSULTING.COM

PROJECT DESCRIPTION/ SCOPE OF WORK

- INSTALL (9) NEW RRU'S, (3) PER SECTOR
- RELOCATE (9) EXISTING RRU'S, (3) PER SECTOR
- REMOVE (3) EXISTING RRU'S AT GRADE
- INSTALL (3) NEW PANEL ANTENNAS, (1) PER SECTOR
- INSTALL (1) NEW DC-6 DOME (DC ONLY)
- INSTALL (2) NEW 6/C DC CABLES
- INSTALL (6) NEW LOW BAND COMBINERS, (2) PER SECTOR
- REPLACE EXISTING ANTENNA MOUNTS WITH (3) NEW SECTOR FRAMES, (1) PER SECTOR
- REMOVE (1) DUS
- INSTALL (1) 5216, (1) XMU AND (1) 6630
- INSTALL (12) TELCO FLEX BETWEEN RAYCAP AND PP
- INSTALL (3) EMERSON RECTIFIERS TO POWER PLANT

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 2346933, VERSION 2.0, LAST UPDATED 06/14/18.

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SHEET TITLE: TITLE SHEET
SHEET NUMBER: T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - EMPIRE TELECOM
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
33. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION.
35. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
36. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
50. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.

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Phone: 732.383.1950
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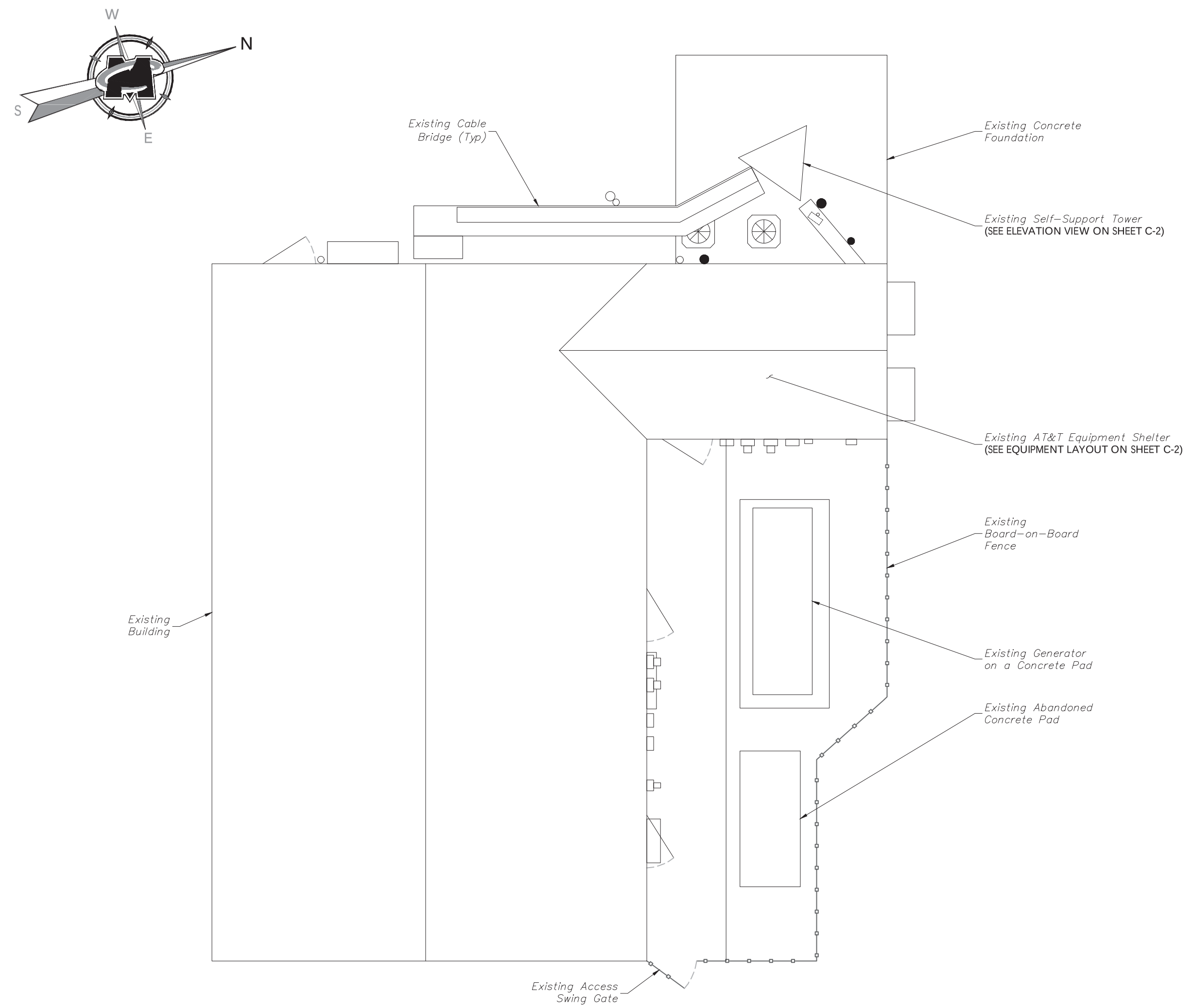
email: solutions@maserconsulting.com

SHEET TITLE: GENERAL NOTES

SHEET NUMBER: GN-1



COMPOUND PLAN

SCALE : 1" = 4' FOR 22"X34"
(SCALE : 1" = 8' FOR 11"X17")

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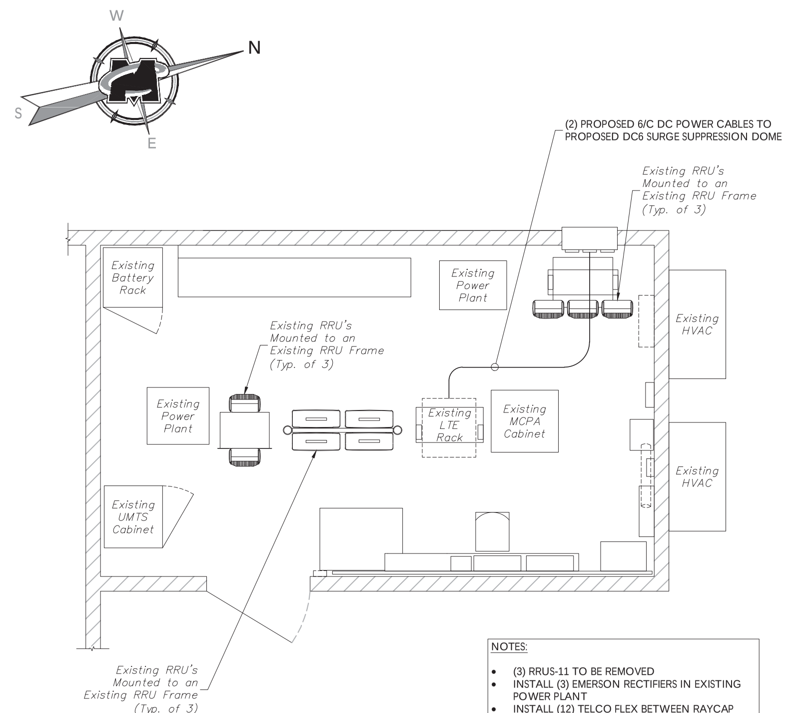
SHEET TITLE: COMPOUND PLAN

SHEET NUMBER: C-1

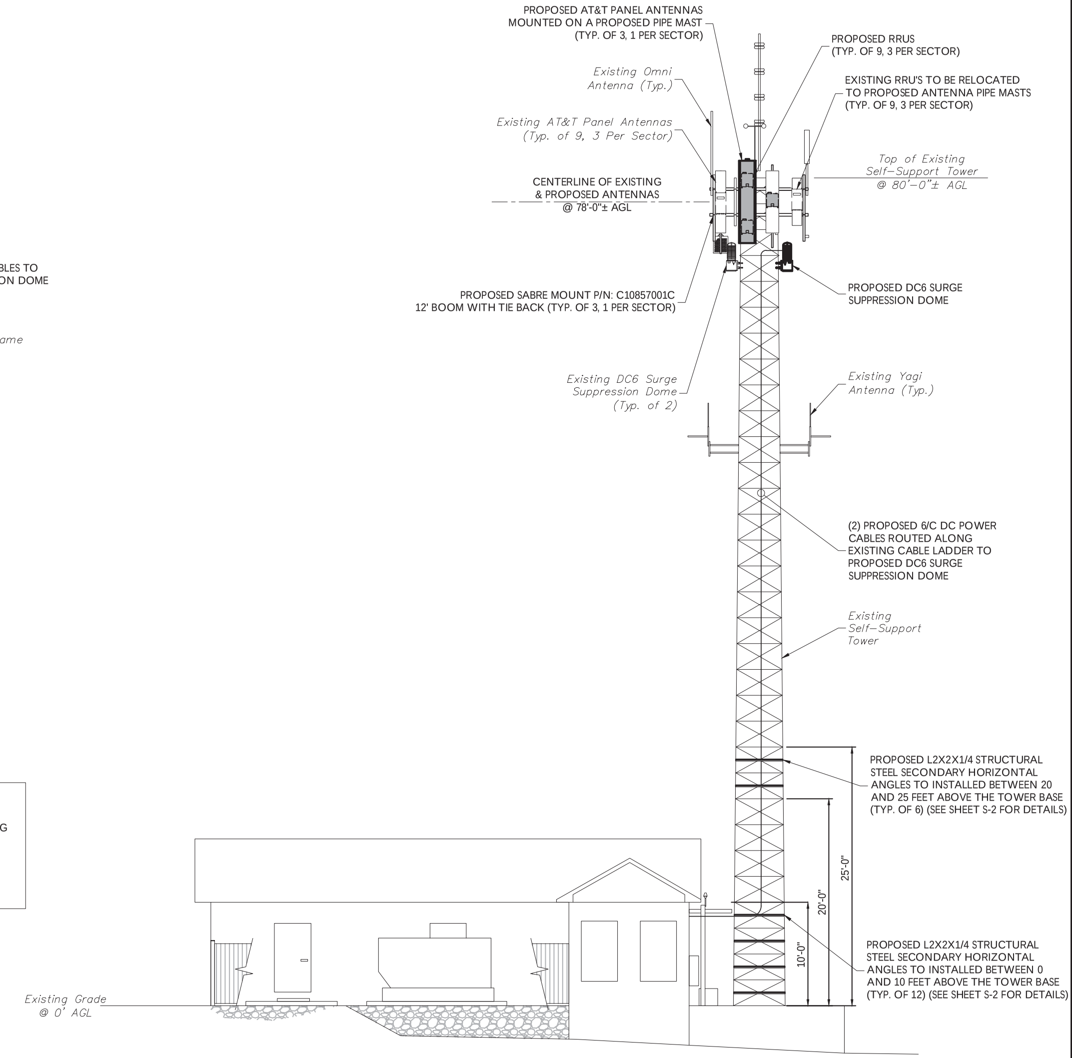


NOTES:

- (3) RRUS-11 TO BE REMOVED
- INSTALL (3) EMERSON RECTIFIERS IN EXISTING POWER PLANT
- INSTALL (12) TELCO FLEX BETWEEN RAYCAP AND EXISTING POWER PLANT
- REMOVE (1) DUS
- INSTALL (1) 5216, (1) XMU AND (1) 6630

EQUIPMENT LAYOUT

SCALE : 1" = 2' FOR 22"X34"
(SCALE : 1" = 4' FOR 11"X17")



ELEVATION VIEW

SCALE : 1" = 6' FOR 22"X34"
(SCALE : 1" = 12' FOR 11"X17")

STRUCTURAL NOTES:

1. A STRUCTURAL ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., DATED 11/16/2018 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE TOWER AND ANTENNA MOUNT TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE TOWER AND ANTENNA MOUNT HAVE BEEN DETERMINED TO HAVE ADEQUATE CAPACITY.

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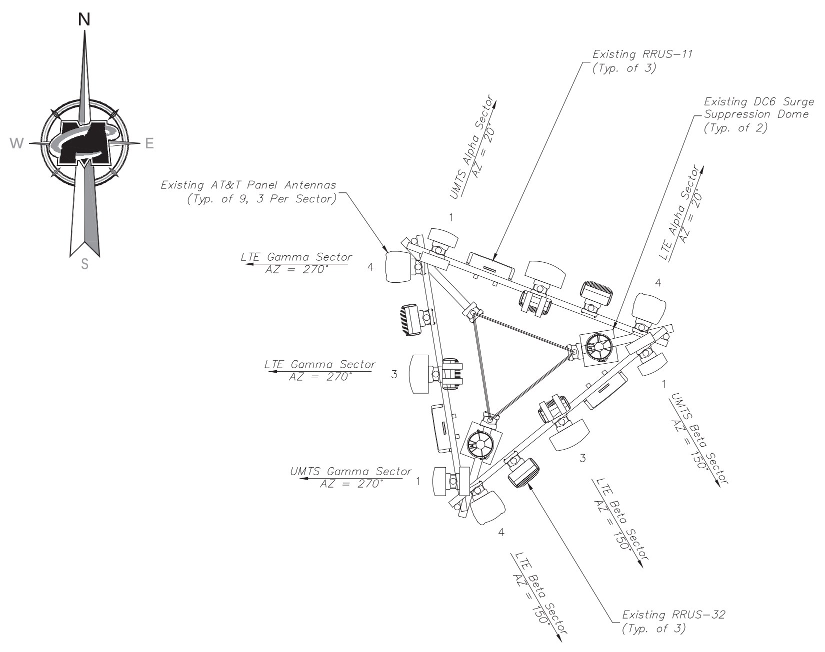
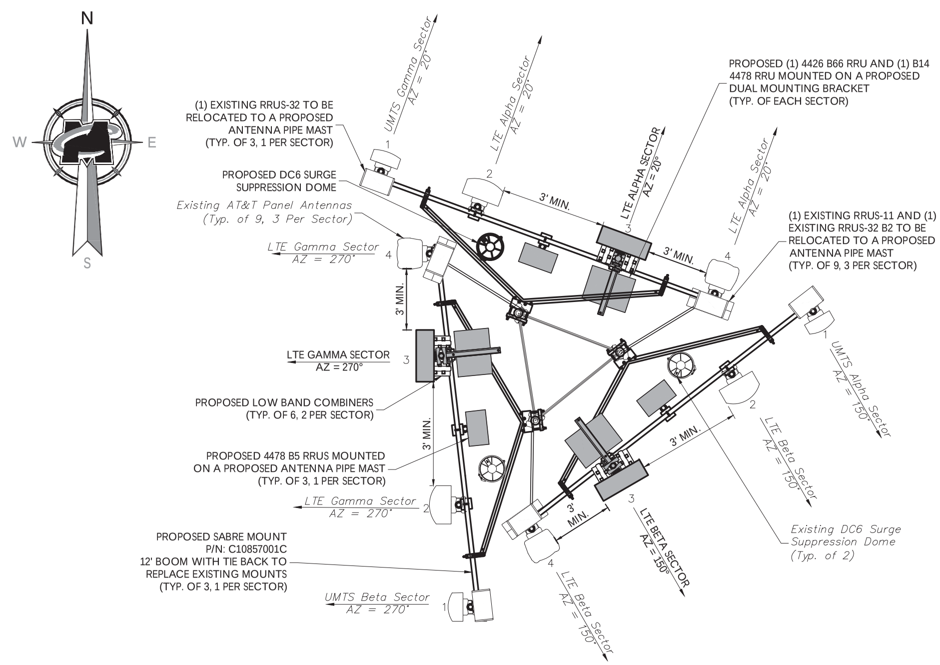
SHEET TITLE: EQUIPMENT LAYOUT AND ELEVATION VIEW

SHEET NUMBER: C-2



EXISTING ANTENNA LAYOUT
NOT TO SCALE



PROPOSED ANTENNA LAYOUT
NOT TO SCALE

ANTENNA SCHEDULE

	SECTOR	EXISTING ANTENNA	PROPOSED ANTENNA	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH (DEG.)	ANT. CL. ELEV. (ft.)	REMOTE RADIO/TMA CONFIGURATION	TRANSMISSION CABLE QUANTITY	TRANSMISSION CABLE TYPE	TRANSMISSION CABLE STATUS
Sector 1	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	150	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	88.00	20	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	1/2	FIBER/DC	EXISTING
	3	- -	**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**20**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**2**	**DC**	**PROPOSED**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	20	78	(1) RRUS -11 (1) RRUS-32	-	FIBER/DC	EXISTING
Sector 2	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	270	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	69.50	150	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	-	-	-
	3	**- -**	**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**150**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**-**	**-**	**-**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	150	78	(1) RRUS -11 (1) RRUS-32	-	-	-
Sector 3	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	20	78	(1) POWERWAVE TT19-08BP111-001 TWIN TMA	1	7/8" COAX	EXISTING
	2	CCI OPA-65R-LCUU-H6	CCI OPA-65R-LCUU-H6	LTE	EXISTING	72.00	14.80	7.40	69.50	270	78	(1) RRUS-E2 B29 (AT GRADE) RRUS-32	-	-	-
	3		**KATHREIN 80010965**	**LTE**	**PROPOSED**	**78.70**	**20.00**	**6.90**	**108.60**	**270**	**78**	**(1) B14 4478 (1) 4478 B5 (1) RRUS-32 B2 (2) DBCT108F1V92-1**	**-**	**-**	**-**
	4	QUINTEL QS66512-2	QUINTEL QS66512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	270	78	(1) RRUS -11 (1) RRUS-32	-	-	-

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SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
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3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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SITE# CT2168
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WALLINGFORD, CT 06492
NEW HAVEN COUNTY

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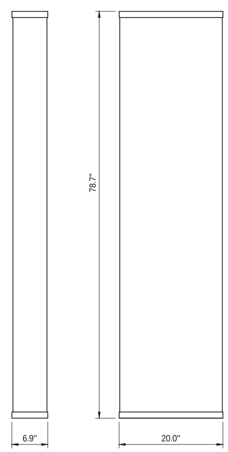
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE:
ANTENNA LAYOUTS AND ANTENNA SCHEDULE

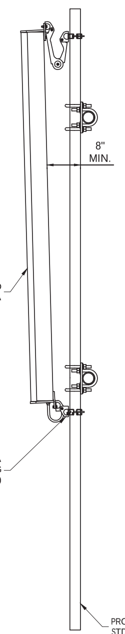
SHEET NUMBER:
C-3



WEIGHT = 108.6 LBS

KATHREIN 800-10965

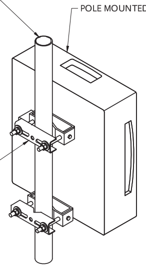
ANTENNA DETAILS



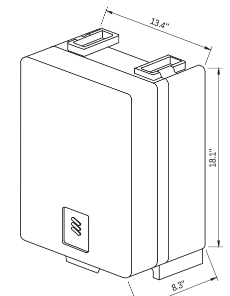
ANTENNA MOUNTING DETAIL
NOT TO SCALE

NOTE:

8" MINIMUM SEPERATION BETWEEN BACK OF PANEL ANTENNA AND EXISTING/PROPOSED EQUIPMENT

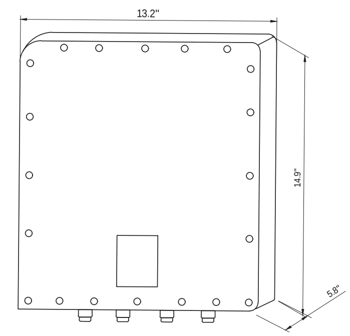


RRUS PIPE MOUNTING DETAIL
NOT TO SCALE



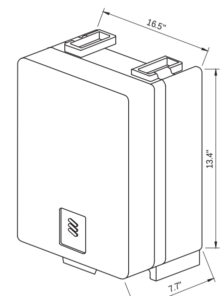
DIMENSIONS (H X W X D): 18.1"H X 13.4"W X 8.3"D (INCLUDES SUNSHIELD)
WEIGHT: 59.4 LBS

RRUS-4478 B14 DETAIL
NOT TO SCALE



RRUS 4426 B66 DIMENSIONS (H X W X D): 14.9" X 13.2" X 5.9"
(INCLUDES SUNSHIELD) WEIGHT: 48 LBS

RRUS 4426 B66 DETAIL
NOT TO SCALE



DIMENSIONS (H X W X D): 16.5"H X 13.4"W X 7.7"D (INCLUDES SUNSHIELD)
WEIGHT: 59.9 LBS

RRU-4478-B5 DETAIL
NOT TO SCALE

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1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: 32577

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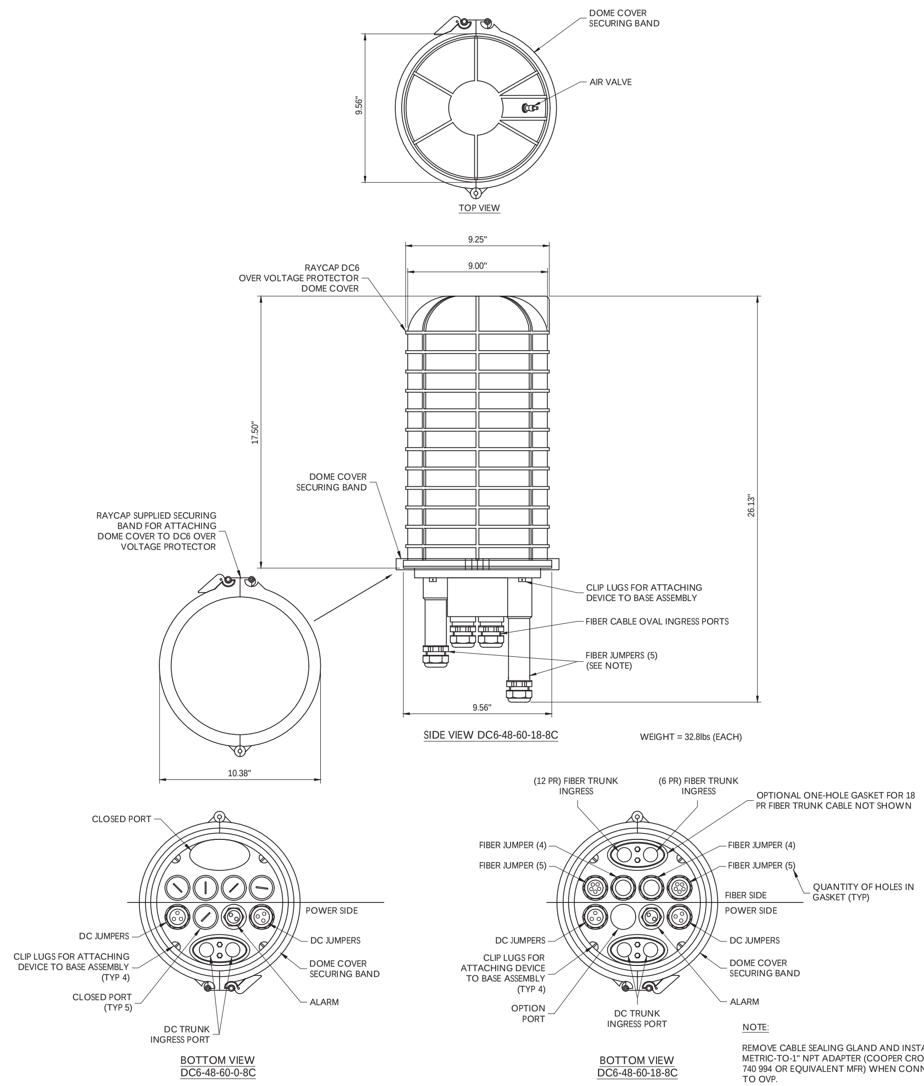
SHEET TITLE:
DETAILS

SHEET NUMBER:
A-1

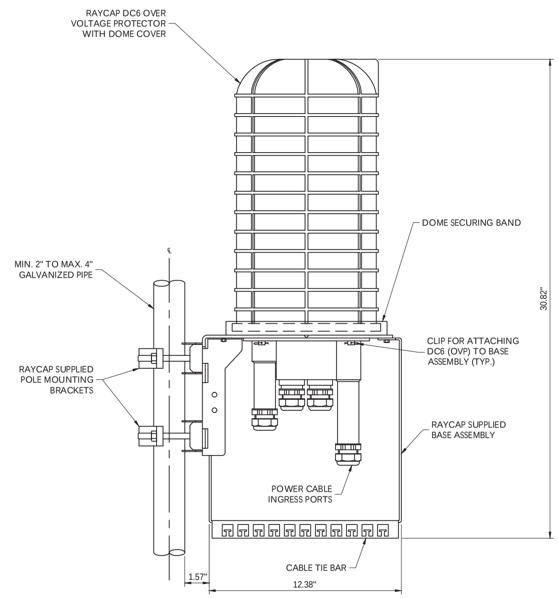


NOTE:

REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE



ELEVATION

NOTES:

RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

RAYCAP DC6-48-60-18-8C & DC6-48-60-0-8C
DC POWER OVER VOLTAGE PROTECTOR (OVP)
POLE MOUNT BASE ASSEMBLY

NOT TO SCALE

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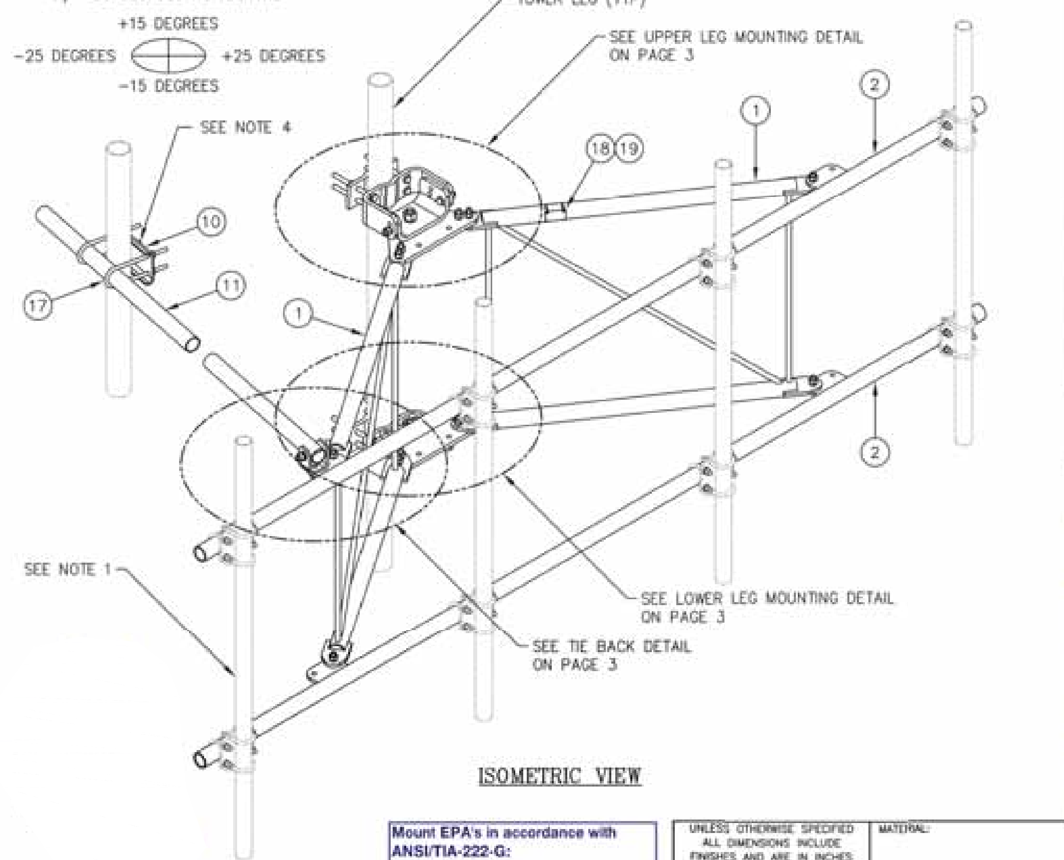
SHEET TITLE:
DETAILS

SHEET NUMBER:
A-2

TIEBACK ANGLE RANGE DETAIL

+/- 15 DEGREES VERTICAL
+/- 25 DEGREES HORIZONTAL



ISOMETRIC VIEW

Mount EPA's in accordance with ANSI/TIA-222-G:
$(EPA)_N$ = 9.12 sq.ft.
$(EPA)_T$ = 5.23 sq.ft.
***Excludes mount pipes**

NOTES:

1. MOUNTING PIPES & CROSSOVER PLATE KITS MUST BE PURCHASED SEPARATELY.
2. QUANTITIES SHOWN IN LISTS OF MATERIAL ARE FOR ONE (1) V-BOOM ONLY.
3. THIS V-BOOM WILL MOUNT TO THE FOLLOWING: 1 1/2"ø TO 5 9/16"ø ROUND LEG.
4. TIEBACK MUST BE CONNECTED TO A RIGID MEMBER THAT PROVIDES ADEQUATE SUPPORT WITHIN THE LIMITS NOTED ABOVE IN THE TIEBACK ANGLE RANGE DETAIL UNLESS APPROVED BY THE ENGINEER OF RECORD.

C10857001C 12' HD V-BOOM ASSEMBLY W/TIEBACK

ITEM	QTY.	PART NO.	DESCRIPTION	WEIGHT
1.	2	CW01222	WELDMENT, STANDOFF ARM	126
2.	2	CW01223	WELDMENT, FACE PIPE	147
3.	2	CS03109	PLATE, ROTATING	34
4.	1	CS03110	PLATE, PIVOTING (UPPER)	16
5.	1	CS03111	PLATE, LEG CLAMP (UPPER)	17
6.	1	CS03112	PLATE, PIVOTING (LOWER)	14
7.	1	CS03113	PLATE, LEG CLAMP (LOWER)	17
8.	2	CS03114	PLATE, LEG CLAMP (BACK)	14
9.	1	CS00098	PLATE, TIE BACK SWIVEL	3
10.	1	CS03285	PLATE, TIE BACK CLAMP	4
11.	1	CS03333	PIPE, TIE BACK	38
12.	2	C40026073	BOLT ASSEMBLY, 1 ø X 3 A325	4
13.	8	C40140004	BOLT ASSEMBLY, 5/8 ø X 8 A307	13
14.	1	C40026033	BOLT ASSEMBLY, 5/8 ø X 4 1/2 A325	1
15.	12	C40026025	BOLT ASSEMBLY, 5/8 ø X 2 1/2 A325	6
16.	5	C40026024	BOLT ASSEMBLY, 5/8 ø X 2 1/4 A325	3
17.	2	C40034183	U-BOLT ASSEMBLY, 1/2 ø X 2 9/16 C-C	3
18.	1	Z30992001	MOUNT CLASSIFICATION TAG C10857001C	1
19.	2	C40062103	STAINLESS STEEL SELF-LOCKING CABLE TIE	1
			TOTAL WEIGHT	462

PACKAGING NOTE

CK00386 INCLUDES ITEMS 1, 3, 4, 5, 6, 7, 12 & 15 (8 QTY)
CK00387 INCLUDES ITEMS 2, 8, 9, 10, 11, 13, 14, 15 (4 QTY), 16, 17, 18 & 19

This mount satisfies the Heavy-10 requirements as specified in AT&T RPF No. 20160229.002.P for Antenna Sector Mounts.
It satisfies ANSI/TIA-222-G for the following parameters:
Structure Class II, Exposure Category C, Topographic Category 1
Mount and antenna centerline at 300' AGL
Gust effect factor = 1.0, Wind direction probability factor = 0.95
Four mount pipes symmetrically placed as shown
Bare condition
Basic wind speed = 120 mph
$(EPA)_N = (EPA)_T$ = 15.0 sq.ft. per mount pipe
Factored Weight = 663 lbs per mount pipe
Iced condition
Basic wind speed = 60 mph, Design ice thickness, t_i = 1.0 in
$(EPA)_N = (EPA)_T$ = 24.0 sq.ft. per mount pipe
Factored Weight = 1325 lbs per mount pipe

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16"; ANGLES ± 1/2 DEG.; DECIMALS ± .010"
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION
2	02/05/16			ADDED PACKAGING NOTE
1	01/21/16			REVISED NOTES & ADDED TIEBACK ANGLE RANGE DETAIL

Sabre Industries
Towers and Poles

CONFIDENTIAL

12' HD V-BOOM ASSEMBLY W/TIEBACK
(3' STANDOFF)
W/NO ANTENNA MOUNTING PIPES

DATE	12/22/15	SIZE	DRAWING NO.	REV
DRAWN BY	WRF	B	C10857001C	2
CHECKED BY	EK		SCALE None	PAGE 1 OF 3

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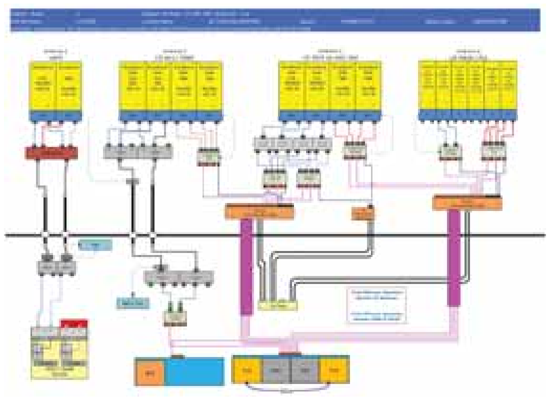
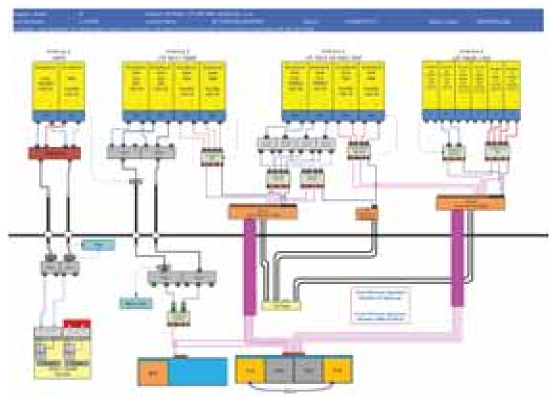
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: RF PLUMBING DIAGRAM

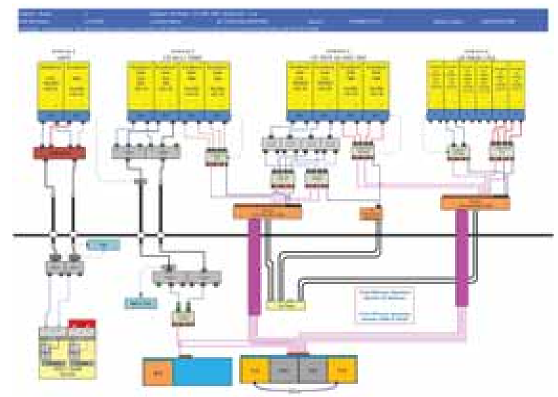
SHEET NUMBER: A-3



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

BASED ON: RF ENGINEERING DESIGN ENTITLED "CTU2168_2018-LTE-Next-Carrier_LTE_sp656b_2051A0GWE7_10035084_4563", LAST REVISED 08/28/2018.

RF PLUMBING DIAGRAMS

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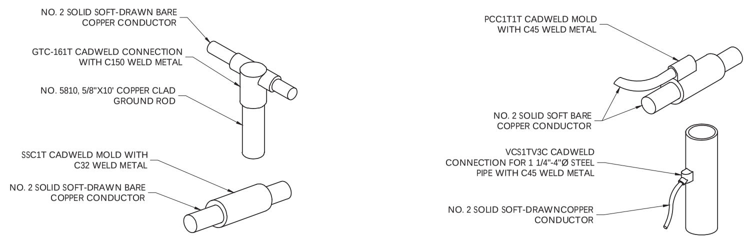
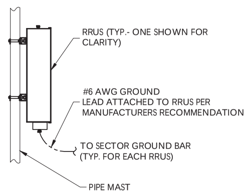
SHEET TITLE:
RF PLUMBING DIAGRAM

SHEET NUMBER:
A-4



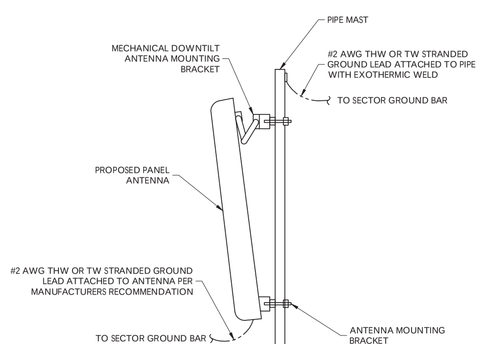
CADWELD DETAILS

NOT TO SCALE



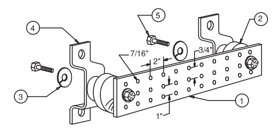
RRU GROUNDING

NOT TO SCALE



ANTENNA GROUNDING

NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PRODUCERS

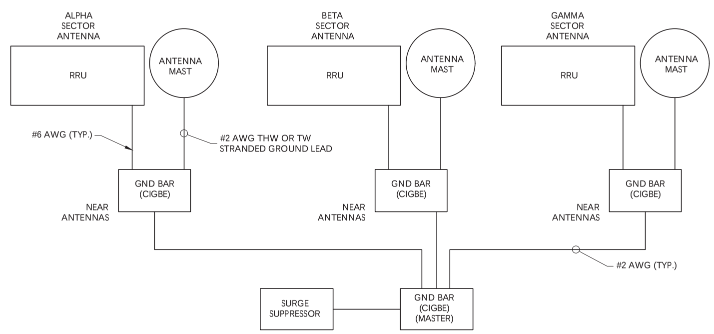
CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLT RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" - SURGE ABSORBERS

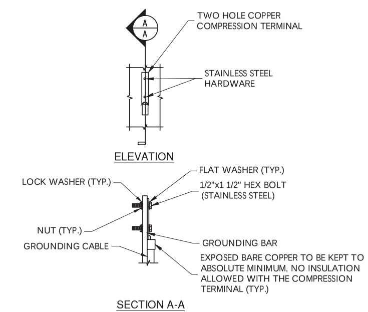
INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

MASTER GROUND BAR

NOT TO SCALE

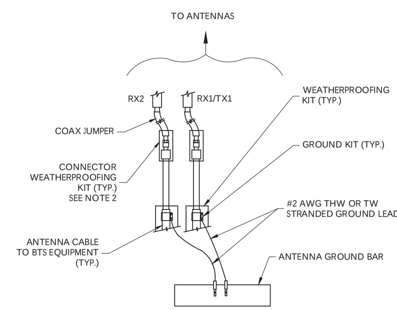


SCHEMATIC DIAGRAM GROUNDING SYSTEM



TYPICAL GROUND BAR CONNECTION DETAIL

NOT TO SCALE



NOTES:

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

TYPICAL GROUND WIRE TO GROUNDING BAR

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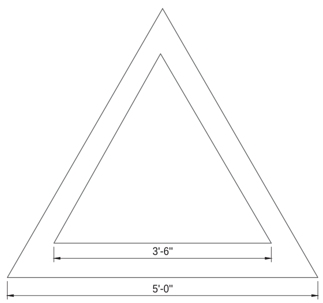
SITE NAME:

MT. TOM WALLINGFORD
FA# 10035084
SITE# CT2168
23 WAYNE ROAD
WALLINGFORD, CT 06492
NEW HAVEN COUNTY

RED BANK OFFICE
331 NEWMAN SPRINGS ROAD
SUITE 203
RED BANK, NJ 07701-5669
Phone: 732.383.1950
Fax: 732.383.1984
email: solutions@maserconsulting.com

SHEET TITLE: GROUNDING DETAILS

SHEET NUMBER: G-1



TOWER PLAN
NOT TO SCALE

TOWER FOUNDATION REACTIONS	
REACTION TYPE	FORCE
COMPRESSION (MAX KIP PER LEG)	209.9
UPLIFT (MAX KIP PER LEG)	199.6
OVERTURNING MOMENT (KIP-FT)	886
SHEAR (KIP)	15.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 8 Bay Di-Pole	90	RRUS 4426 B66 (att)	78
10' Omni	85	RRUS 4426 B66 (att)	78
7' Whip	83	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS11 B12 (Partial Shielded by 11.9" Antenna) (att)	78
7770	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	RRUS 32 B2 (att)	78
CCI OPA-65R-LCUU-H6 Panel Antenna with 8ft Pipe (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	DC6-48-60-18-8C (att)	78
800-10965 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	Pirod 12' PCS T-Frame (1) 104569 (att)	78
QS66512-2 (att)	78	2' dish	73
TMA (att)	78	4' dish	73
TMA (att)	78	1.5" Dia 4' Omni w/Pipe Mount	65
TMA (att)	78	6' Side Arm	65
RRUS 32 (att)	78	6' Side Arm	65
RRUS 32 (att)	78	7' Whip	65
RRUS 32 (att)	78	10' Omni	65
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	4 ' Side Arm	55
RRU B14 4478 (att)	78	10' Omni	55
RRUS 4478 B5 (att)	78	10' Yagi	55
RRUS 4478 B5 (att)	78		
RRUS 4478 B5 (att)	78		
RRUS 4426 B66 (att)	78		

NOTES:

1. EXISTING TOWER MEMBERS WERE DETERMINED FROM A PREVIOUS STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING DATED: 1/05/2017.
2. CONTRACTOR IS TO REMOVE AND REPLACE EXISTING APPURTENANCES, MOUNTS AND TOWER HARDWARE AS NEEDED TO INSTALL THE PROPOSED REINFORCEMENTS.
3. CONTRACTOR SHALL PERFORM A TOWER INSPECTION PRIOR TO PURCHASE AND/OR FABRICATION OF MATERIAL.
4. THE MEANS AND METHODS OF INSTALLATION ARE THE RESPONSIBILITIES OF THE CONTRACTOR.
5. ZRC GALVANIZING COMPOUND OR EQUAL SHALL TREAT ALL WELDED AREAS.
6. CONTRACTOR SHALL NOT REUSE EXISTING BOLTS AND ASSOCIATED HARDWARE.
7. ONCE THE TOWER MODIFICATIONS HAVE BEEN COMPLETED, THE OVERALL TOWER USAGE WILL BE DETERMINED TO BE 96.8% FOR THE EXISTING AND PROPOSED LOADING.

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SCALE: AS SHOWN
JOB NUMBER: 18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
6	03/13/19	REVISED PER COMMENTS	AJC	RA
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
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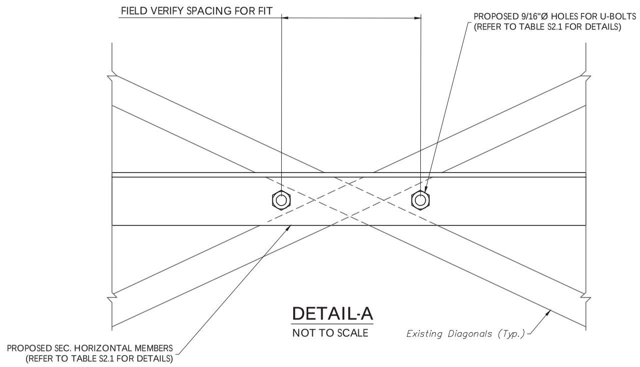
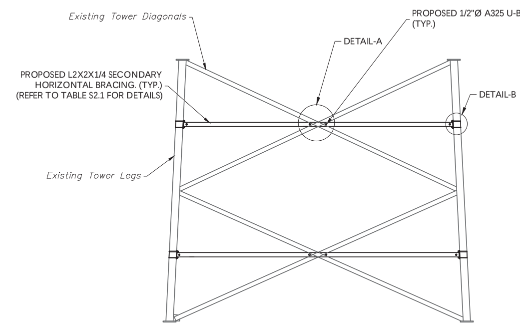
SHEET TITLE: STRUCTURAL DETAILS

SHEET NUMBER: S-1



DETAIL-A
NOT TO SCALE

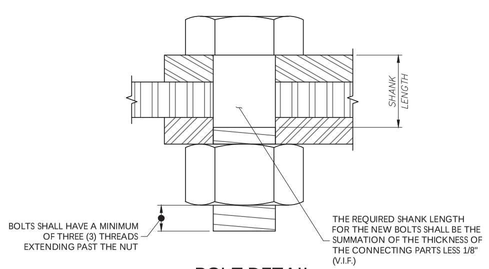


SECONDARY HORIZONTAL ANGLE DETAILS
NOT TO SCALE

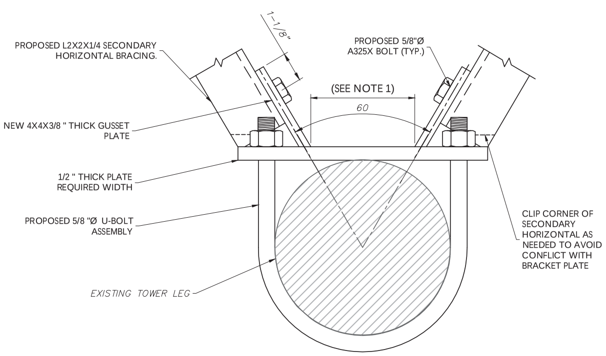
TABLE S2.1 - TOWER BRACING MODIFICATION TABLE

ELEVATION (FT)	MEMBER TYPE	EXISTING MEMBER SIZE	QTY	PROPOSED MEMBER SIZE	QTY	LENGTH	END BOLT	QTY	CENTER BOLT	QTY
1'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±5'-0"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
3'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-11"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
6'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-10"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
8'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-10"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
21'-3"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-8"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3
23'-9"	SEC. HORIZONTALS	-	-	L2X2X1/4	3	±4'-7"	5/8" Ø A325	16	1/2"Ø A325 U-BOLT	3

LENGTH IS THEORETICAL. CONTRACTOR TO FIELD VERIFY THE LENGTH OF THE EXISTING MEMBERS IN THE FIELD PRIOR TO FABRICATION OF THE PROPOSED BRACING MEMBER

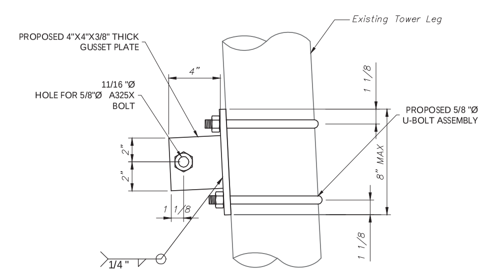


BOLT DETAIL
NOT TO SCALE



DETAIL-B (PLAN VIEW) - W/ EXISTING LEG
NOT TO SCALE

NOTE 1:
CONTRACTOR TO VERIFY THAT GUSSET PLATE ALLOWS FOR SECONDARY HORIZONTAL TO BE INSTALLED ON ONE SIDE OF TOWER FACE AND FLUSH WITH EXISTING DIAGONAL BRACING



DETAIL-B (SIDE VIEW)
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SHEET TITLE:
STRUCTURAL DETAILS

SHEET NUMBER:
S-2

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF REVISIONS TO CONTRACT DOCUMENTS AND REQUIREMENTS TO ALL SUBCONTRACTORS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND EQUIPMENT MANUFACTURERS.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES, GROUNDS, DRAIN PIPES AND VENTS BEFORE COMMENCING WORK. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL CONDITIONS DIFFER SIGNIFICANTLY FROM WHAT IS SHOWN ON DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY PROJECT SITE, REMOVE AND DISPOSE OF OFF SITE RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES DAILY.
4. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE OWNER'S WRITTEN APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUCH COVERING, SHIELDING, AND BARRICADES AS REQUIRED TO PROTECT BYSTANDERS AND PASSERSBY, EQUIPMENT, SUPPLIES, ETC. FROM DUST, DEBRIS AND OTHER CAUSE OF DAMAGE RESULTING FROM CONSTRUCTION. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED TO PREVIOUS CONDITIONS.
6. IN AREAS WHERE EXISTING ANTENNA MOUNTS, TRANSMISSION LINES OR OTHER SUPPORTING EQUIPMENT IS TO BE REMOVED, THE EXISTING STRUCTURE SHALL BE REPAIRED AS REQUIRED.
7. ALL SAFETY AND OSHA REGULATIONS SHALL BE FOLLOWED STRICTLY. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTOR'S RESPONSIBILITY.
8. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS, TRANSMISSION LINES OR OTHER APPURTENANCES DURING CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.
10. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE TOWER UNTIL THE MODIFICATION WORK IS COMPLETE.
11. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH TOWER MANUFACTURER OR FIELD VERIFY DIMENSIONS PRIOR TO FABRICATING MEMBERS.
12. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.
13. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
14. MODIFICATION DETAILS REPRESENTS TYPICAL CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DEVIATION AS A RESULT OF SITE SPECIFIC CONDITIONS. REINFORCE ALL TOWER FACES IDENTICALLY, UNLESS OTHERWISE NOTED.
15. IN AREAS TO BE MODIFIED, ANY ANTENNA, COAX, OR CONDUIT SHALL BE TEMPORARILY MOVED AND THEN REPLACED AFTER COMPLETION OF WORK. COORDINATE WITH OWNER.
16. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL MATERIAL TO BE REMOVED.
17. CONTRACTOR SHALL ENSURE STABILITY OF TOWER DURING ALL WORK.
18. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE TEMPORARY BRACING OF THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT BEFORE COMPLETIONS.
19. THIS DESIGN ASSUMES THE TOWER AND FOUNDATIONS HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A COMMON ASSESSMENT BY MASER CONSULTING P.A.. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TO ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.
20. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
21. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
22. INSPECTION OF THE MODIFICATIONS SHALL BE COMPLETED BY A THIRD PARTY. INSPECTION SHALL TAKE PLACE WITHIN 72 HOURS OF THE COMPLETION OF THE TOWER MODIFICATIONS. NO PROPOSED LOADING SHALL BE INSTALLED PRIOR TO INSPECTOR APPROVAL.

DESIGN LOADS

1. WIND: EIA/TIA-222-G
   WIND SPEED: 125 MPH (ULTIMATE)
   EXPOSURE CATEGORY C
   TOPOGRAPHIC CATEGORY 1
2. DESIGN BASED ON THE SAME TOWER LOADING AND ASSUMPTIONS NOTED IN STRUCTURAL ANALYSIS REPORT BY MASER CONSULTING P.A. DATED NOVEMBER 16, 2018.
3. TOWER MODIFICATIONS WERE DESIGNED IN ACCORDANCE TO TIA-222-G AND 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING IBC 2015.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FOURTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. FIELD WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE - STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
4. RETURN ALL WELDS AT CORNERS TWICE THE NOMINAL SIZE OF THE WELD MINIMUM, UNLESS OTHERWISE NOTED.
5. TO REDUCE WARPING TO A MINIMUM WHEN WELDING TO EXISTING MEMBERS CARRYING LOAD, SHORE OR BRACE EXISTING MEMBER DURING WELDING.
6. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
7. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
8. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
9. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

PLATES	ASTM A572 (GR 36)
ANGLES	ASTM A36 (GR 36) (U.N.O)
SOLID ROUND	ASTM A572 (GR 50)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.)
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

SITE PREPARATION

1. PLACE CONCRETE AS SOON AS PRACTICAL AFTER EXCAVATION IS MADE TO PRESERVE THE INTEGRITY OF THE FOUNDATION, EXCAVATION AND BEARING CAPACITY. REMOVAL OF ANY WATER ACCUMULATED IN EXCAVATION IS REQUIRED PRIOR TO PLACEMENT OF CONCRETE.
2. ALL EXCAVATIONS SHALL CONFORM TO CURRENT OSHA REQUIREMENTS. CONTRACTOR WILL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING, ALL EXCAVATIONS AND EXISTING STRUCTURES DURING CONSTRUCTION BY PROPER SAFEGUARDS WHICH MAY INCLUDE BRACING.
3. EXCAVATIONS SHALL BE FLAT AND LEVEL AND WELL CLEANED OF ALL LOOSE, WET SOIL OR ROCK. EXCAVATIONS SHALL BE FINISHED BY HAND. BACKFILL ANY OVEREXCAVATIONS.

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND MASER CONSULTING P.A. THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND MASER CONSULTING P.A. ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND MASER CONSULTING P.A.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, MASER CONSULTING P.A. SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING, CLIMBING SUPPORTS, STEP BOLTS, PORT HOLES, AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS.
7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.
10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH) CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL TOWER SHORING, TEMPORARY GLOBAL TOWER SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING, TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
11. MODIFICATIONS SHOWN SHALL BE INSTALLED ON ALL TOWER LEGS/FACES.

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SHEET TITLE :
STRUCTURAL NOTES

SHEET NUMBER :
S-3

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING
X	ENGINEER OF RECORD APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
-	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT
-	FABRICATOR NDE INSPECTION
-	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	

DURING CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	REPORT ITEM
X	CONSTRUCTION INSPECTIONS
X	FOUNDATION INSPECTIONS
-	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR BOLT VERIFICATION
-	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
-	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
-	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	

AFTER CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD	
X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR BOLT PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MODIFICATION INSPECTION REPORT
- DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD.
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.
3. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. CONTACT LISTED ON THE TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSPECTION TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
   - WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
   - DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS
2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:
   - REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST
   - WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MODIFICATION INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
   - BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS
2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:
   - IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MODIFICATION INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MODIFICATION INSPECTION TO BE CONDUCTED.
   - THE GC AND MODIFICATION INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
   - IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MODIFICATION INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
   - WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MODIFICATION INSPECTOR ON-SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MODIFICATION INSPECTION. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MODIFICATION INSPECTION CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FLEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
   - CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MODIFICATION INSPECTION.
   - OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH THE ENGINEER OF RECORD TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
2. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:
   - PRE-CONSTRUCTION GENERAL SITE CONDITION
   - PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
     - RAW MATERIALS
     - PHOTOS OF ALL CRITICAL DETAILS
     - FOUNDATION MODIFICATIONS
     - WELD PREPARATION
     - BOLT INSTALLATION AND TORQUE
     - FINAL INSTALLED CONDITION
     - SURFACE COATING REPAIR
   - POST CONSTRUCTION PHOTOGRAPHS FINAL INFIELD CONDITION
   - ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATIONS
2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

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SCALE:	JOB NUMBER:
AS SHOWN	18963007A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
6	03/13/19	REVISED PER COMMENTS	AJC	RA
5	02/22/19	STRUCTURAL REVISIONS	AJC	RA
4	02/11/19	REVISED PER COMMENTS	AJC	RA
4	12/18/18	REVISED PER COMMENTS	AJC	RA
3	11/30/18	NEW MOUNT REVISION	AJC	RA
2	09/25/18	REVISED PER COMMENTS	AJC	RA
1	09/14/18	ISSUED FOR REVIEW	MJB	RA

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

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SHEET TITLE:
TOWER MODIFICATION INSPECTION CHECKLIST

SHEET NUMBER:
S-4