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

VIA ELECTRONIC MAIL

October 19, 2020

Elizabeth Jamieson
Transcend Wireless
10 Industrial Avenue, Suite 3
Mahwah, NJ 07430

RE: **EM-T-MOBILE-153-201007** – T-Mobile notice of intent to modify an existing telecommunications facility located at 27 Siemon Company Drive, Watertown, Connecticut.

Dear Ms. Jamieson:

The Connecticut Siting Council (Council) is in receipt of your correspondence of October 16, 2020 submitted in response to the Council's October 16, 2020 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,

s/ Melanie A. Bachman

Melanie A. Bachman
Executive Director

MAB/IN/emr

From: ejamieson@transcendwireless.com <ejamieson@transcendwireless.com>
Sent: Friday, October 16, 2020 2:17 PM
To: Fontaine, Lisa <Lisa.Fontaine@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: FW: CTNH354A FW: Incomplete Letter for EM-T-MOBILE-153-201007

Members of the Council

Structural Analysis and Mount Analysis updated per your request.
Thank you

Elizabeth

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

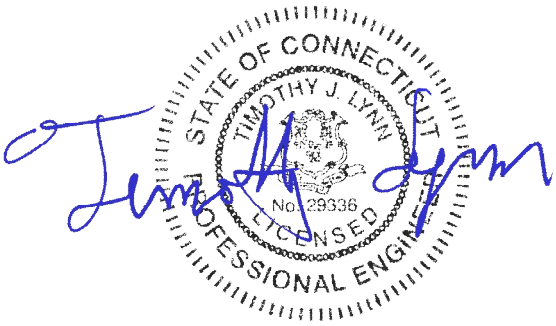
140-ft Existing Masonry Smokestack

T-Mobile Site #: CTNH354A

27 Siemon Company Drive
Watertown, CT

Centek Project No. 20074.94

~~Date: September 4, 2020~~
Rev 1: October 16, 2020



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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

Table of Contents

Introduction

The purpose of this report is to summarize the results of the structural analysis of the equipment upgrade proposed by T-Mobile on the existing host masonry smokestack located in Watertown, CT.

The host structure is a 140-ft tall masonry smokestack. The smokestack geometry and structural information was obtained from a structural report prepared by International Chimney Corporation dated May 16, 2011.

Equipment Installation Summary

- **T-MOBILE (Existing to Remove):**
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas, three (3) Andrew LNX-6515DS panel antennas, three (3) Ericsson RRUS-11 remote radio units and six (6) TMAs mounted on antenna pipes attached to the smokestack with a RAD center elevation of +/- 124-ft.
  Cables: Eighteen (18) coax cables routed within the existing smokestack.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) RFS APXVAALL24-43 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) Ericsson 4449 remote radio units and three (3) Ericsson 4415 remote radio units mounted on proposed steel frames attached to the smokestack with a RAD center elevation of +/- 124-ft.
  Cables: Three (3) 6x12 hybrid cables routed within the existing smokestack.

Design Loading

Loading was determined per the requirements of the 2015 International Building Code and ASCE 7-10 “Minimum Design Loads for Buildings and Other Structures”.

Wind Speed:	Vult = 120 mph	*[Appendix N of the 2018 CT Building Code]*
Exposure Category:	B	
Risk Category	II	*[ASCE 7-10, Table 1.5-1]*

Results

Smokestack:

Component	Stress Ratio (percentage of capacity)	Result
Compression	34%	**PASS**
Tension of Mortar	57%	**PASS**

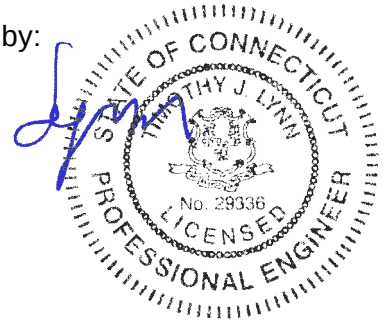
Conclusion and Recommendations

This analysis shows that the subject smokestack **is adequate** to support the proposed T-Mobile equipment upgrade.

The analysis is based, in part on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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

Subject: Wind Load on Equipment per ASCE 7-10

Location: Watertown, CT

Rev. 0: 9/3/20

Prepared by: T.J.L; Checked by: CFC
Job No. 20074.94

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 120$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$	(User Input)	
Structure Type =	$Structuretype := Round\_Chimney$	(User Input)	
Structure Height =	$Height := 140$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 12$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 26.9-1)

$$zg := \begin{cases} 1200 \text{ if } Exp = B = 1.2 \times 10^3 \\ 900 \text{ if } Exp = C \\ 700 \text{ if } Exp = D \end{cases}$$

3-Sec Gust Speed Power Law Exponent = (Table 26.9-1)

$$\alpha := \begin{cases} 7 \text{ if } Exp = B = 7 \\ 9.5 \text{ if } Exp = C \\ 11.5 \text{ if } Exp = D \end{cases}$$

Integral Length Scale Factor = (Table 26.9-1)

$$l := \begin{cases} 320 \text{ if } Exp = B = 320 \\ 500 \text{ if } Exp = C \\ 650 \text{ if } Exp = D \end{cases}$$

Integral Length Scale Power Law Exponent = (Table 26.9-1)

$$E := \begin{cases} \frac{1}{3} \text{ if } Exp = B = 0.333 \\ \frac{1}{5} \text{ if } Exp = C \\ \frac{1}{8} \text{ if } Exp = D \end{cases}$$

Turbulence Intensity Factor = (Table 26.9-1)

$$c := \begin{cases} 0.3 \text{ if } Exp = B = 0.3 \\ 0.2 \text{ if } Exp = C \\ 0.15 \text{ if } Exp = D \end{cases}$$

Exposure Constant = (Table 26.9-1)

$$Z_{min} := \begin{cases} 30 \text{ if } Exp = B = 30 \\ 15 \text{ if } Exp = C \\ 7 \text{ if } Exp = D \end{cases}$$

Topographic Factor =	$K_{zt} := 1$	(Eq. 26.8-2)
Wind Directionality Factor =	$K_d = 0.95$	(Table 26.6-1)
Peak Factor for Background Response =	$g_Q := 3.4$	(Sec 26.9.4)
Peak Factor for Wind Response =	$g_v := 3.4$	(Sec 26.9.4)

CENTEK engineering
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Subject: Wind Load on Equipment per ASCE 7-10

Location: Watertown, CT

Rev. 0: 9/3/20

Prepared by: T.J.L; Checked by: CFC
Job No. 20074.94

Equivalent Height of Structure =

$$z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 84$$

(Sec 26.9.4)

Intensity of Turbulence =

$$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.257$$

(Eq. 26.9-7)

Integral Length Scale of Turbulence =

$$L_z := l \cdot \left(\frac{z}{33}\right)^{E} = 436.923$$

(Eq. 26.9-9)

Background Response Factor =

$$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_z}\right)^{0.63}}} = 0.869$$

(Eq. 26.9-8)

Gust Response Factor =

$$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.853$$

(Eq. 26.9-6)

Velocity Pressure =

$$q_z := 0.00256 \cdot K_{zt} \cdot K_d \cdot V^2 = 35.02$$

(Eq. 29.3-1)

Force Coefficient =

$$C_f = 0.826$$

(Fig 29.5-1 - 29.5-3)

Ultimate Wind Pressure =

$$F := q_z \cdot G \cdot C_f = 24.7 \text{ psf}$$

Height Above Grade =

$$Z := 135 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.08 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$

(Table 29.3-1)

$$K_z = 1.077$$

Height Above Grade =

$$Z := 120 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.04 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$

(Table 29.3-1)

$$K_z = 1.041$$

Height Above Grade = $Z := 100$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.99$ (Table 29.3-1)

$K_z = 0.988$

Height Above Grade = $Z := 80$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.93$ (Table 29.3-1)

$K_z = 0.927$

Height Above Grade = $Z := 60$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.85$ (Table 29.3-1)

$K_z = 0.854$

Height Above Grade = $Z := 40$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.76$ (Table 29.3-1)

$K_z = 0.761$

Height Above Grade = $Z := 15$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 0.57 & \text{if } Z < 15 \end{cases}$ (Table 29.3-1)

$K_z = 0.575$

Height Above Grade = $Z := 5$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 0.57 & \text{if } Z < 15 \end{cases}$ (Table 29.3-1)

$K_z = 0.575$

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Job :	CTNH354A	Project No.	20074.94	Sheet	1 of 2
Address:	27 Siemon Company Drive Watertown, CT	Computed by	TJL	Date	9/4/20
Description:	Smokestack Evaluation	Checked by	CFC	Date	

	Wind Force (lb)	Weight (lb)	Height Above Base (ft)	Height (in)
AT&T	2200	1200	135	1620
T-Mobile	2200	1200	124	1488

Section	Top Dia (in)	Bot Dia (in)	Wall Thk (in)	Sect Height (in)	Area At Base (in^2)	Tot. Vol (ft^3)	Unit Weight (pcf)	Weight of Section (lb)	Total Weight (lb)	Axial Stress fa (psi)
1	100	103.2	8	120	2391.424	163.18556	120	19582.26767	21982.26767	9.2
2	103.2	109.4	10	240	3121.16	419.7321	120	50367.85194	72350.11961	23.2
3	109.4	115.7	12	240	3907.416	525.90732	120	63108.87866	135458.9983	34.7
4	115.7	122	14	240	4747.68	639.79725	120	76775.66964	212234.6679	44.7
5	122	128.3	16	240	5641.952	761.18394	120	91342.07334	303576.7412	53.8
6	128.3	134.6	18	240	6590.232	890.06741	120	106808.0898	410384.831	62.3
7	144	144	24	240	9043.2	1255.2736	125	156909.1961	567294.0271	62.7
8	144	144	26	120	9633.52	668.60752	125	83575.93985	650869.9669	67.6

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Job :	CTNH354A	Project No.	20074.94	Sheet	2 of 2
Address:	27 Siemon Company Drive Watertown, CT	Computed by	TJL	Date	9/4/20
Description:	Smokestack Evaluation	Checked by	CFC	Date	

Ultimate Wind Pressure (psf)	ASD Wind Pressure (psf)	KZ	Wind Area (sf)	Wind Force (lb)	Moment @ Base	Section Modulus @ Base	Bending Stress fb (psi)	Allowable Fa (psi)	Allowable Fb (psi)	fa/Fa+fb/Fb		ft	Ft	ft/Ft	
24.7	14.82	1.077	84.7	1351.4	213082.5912	52874.57002	4.0	375	500	0.03	OK	-5.2	40	-0.13	OK
24.7	14.82	1.041	177.2	2733.3	1763004.157	71184.41595	24.8	375	500	0.11	OK	1.6	40	0.04	OK
24.7	14.82	0.988	187.6	2746.6	4128911.946	92009.09306	44.9	375	500	0.18	OK	10.2	40	0.26	OK
24.7	14.82	0.927	198.1	2721.3	7150970.344	115384.1902	62.0	375	500	0.24	OK	17.3	40	0.43	OK
24.7	14.82	0.854	208.6	2639.9	10816371.02	141458.754	76.5	375	500	0.30	OK	22.7	40	0.57	OK
24.7	14.82	0.761	219.1	2470.8	14039057.53	170380.9988	82.4	375	500	0.33	OK	20.1	40	0.50	OK
24.7	14.82	0.575	240.0	2045.2	17803662.38	235123.2	75.7	375	500	0.32	OK	13.0	40	0.32	OK
24.7	14.82	0.575	120.0	1022.6	19277030.92	244182.9722	78.9	375	500	0.34	OK	11.4	40	0.28	OK

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Structural Analysis Report

Antenna Mount Analysis

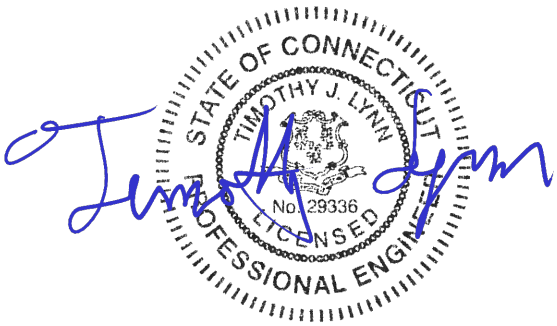
T-Mobile Site #: CTNH354A

27 Siemon Company Drive
Watertown, CT

Centek Project No. 20074.94

Date: September 4, 2020

Max Stress Ratio = 65.3%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

September 4, 2020

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNH354A
27 Siemon Company Drive
Watertown, CT 06795

Centek Project No. 20074.94

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the proposed mount, consisting three (3) sector frames with stiff arms (SitePro p/n USF12-396) to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) and ASCE 7-10.

The loads considered in this analysis consist of the following:

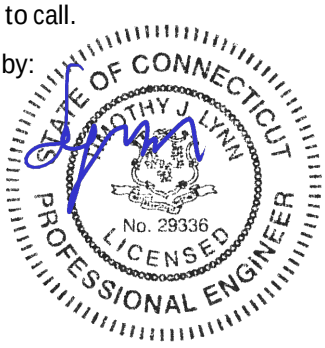
- T-Mobile:
  Sector Frames: Three (3) RFS APXVAALL24_43 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4449 remote radio units and three (3) Ericsson 4415 remote radio units mounted on three (3) Sector Frames with a RAD center elevation of 124-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering an ultimate design wind speed of 120 mph for Watertown as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer



Section 2 - Calculations

CENTEK engineering
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Branford, CT 06405 F: (203) 488-8587

Subject: Wind Load on Equipment per ASCE 7-10

Location: Watertown, CT

Rev. 0: 9/4/20

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 20074.94

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 120$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := B$	(User Input)	
Height Above Grade =	$Z := 124$ ft	(User Input)	
Structure Type =	$Structuretype := Square\_Chimney$	(User Input)	
Structure Height =	$Height := 8$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 2$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 26.9-1)

$$zg := \begin{cases} 1200 \text{ if } Exp = B = 1.2 \times 10^3 \\ 900 \text{ if } Exp = C \\ 700 \text{ if } Exp = D \end{cases}$$

3-Sec Gust Speed Power Law Exponent = (Table 26.9-1)

$$\alpha := \begin{cases} 7 \text{ if } Exp = B = 7 \\ 9.5 \text{ if } Exp = C \\ 11.5 \text{ if } Exp = D \end{cases}$$

Integral Length Scale Factor = (Table 26.9-1)

$$l := \begin{cases} 320 \text{ if } Exp = B = 320 \\ 500 \text{ if } Exp = C \\ 650 \text{ if } Exp = D \end{cases}$$

Integral Length Scale Power Law Exponent = (Table 26.9-1)

$$E := \begin{cases} \frac{1}{3} \text{ if } Exp = B = 0.333 \\ \frac{1}{5} \text{ if } Exp = C \\ \frac{1}{8} \text{ if } Exp = D \end{cases}$$

Turbulence Intensity Factor = (Table 26.9-1)

$$c := \begin{cases} 0.3 \text{ if } Exp = B = 0.3 \\ 0.2 \text{ if } Exp = C \\ 0.15 \text{ if } Exp = D \end{cases}$$

Exposure Constant = (Table 26.9-1)

$$Z_{min} := \begin{cases} 30 \text{ if } Exp = B = 30 \\ 15 \text{ if } Exp = C \\ 7 \text{ if } Exp = D \end{cases}$$

Exposure Coefficient = (Table 29.3-1)

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} \text{ if } 15 \le Z \le zg = 1.05 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} \text{ if } Z < 15 \end{cases}$$

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Subject:	Wind Load on Equipment per ASCE 7-10
Location:	Watertown, CT
Rev. 0: 9/4/20	Prepared by: T.J.L; Checked by: C.F.C. Job No. 20074.94

Topographic Factor =	$K_{zt} := 1$	(Eq. 26.8-2)
Wind Directionality Factor =	$K_d = 0.9$	(Table 26.6-1)
Velocity Pressure =	$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 34.87$	(Eq. 29.3-1)
Peak Factor for Background Response =	$g_Q := 3.4$	(Sec 26.9.4)
Peak Factor for Wind Response =	$g_v := 3.4$	(Sec 26.9.4)
Equivalent Height of Structure =	$z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 30$	(Sec 26.9.4)
Intensity of Turbulence =	$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.305$	(Eq. 26.9-7)
Integral Length Scale of Turbulence =	$L_Z := l \cdot \left(\frac{z}{33}\right)^{E} = 309.993$	(Eq. 26.9-9)
Background Response Factor =	$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_Z}\right)^{0.63}}} = 0.966$	(Eq. 26.9-8)
Gust Response Factor =	$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.905$	(Eq. 26.9-6)
Force Coefficient =	$C_f = 1.35$	(Fig 29.5-1 - 29.5-3)
Wind Force =	$F := q_z \cdot G \cdot C_f = 43$	psf

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Wind Load on Equipment per ASCE 7-10
Location:	Watertown, CT
Rev. 0: 9/4/20	Prepared by: T.J.L; Checked by: C.F.C. Job No. 20074.94

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 132$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 216$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 146$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 132$	lbs

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

Subject: Wind Load on Equipment per ASCE 7-10

Location: Watertown, CT

Rev. 0: 9/4/20

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 20074.94

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 681$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 247$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Development of Wind & Ice Load on Antennas

Antenna Model =	Ericsson AIR6449		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 201$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 81$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Ericsson 4449 B71B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRH} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRH} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRH} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRH} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRH} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 1.4$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.4$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 58$	lbs

Wind Load (Side)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 1.1$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.1$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 46$	lbs

Gravity Load (without ice)

Weight of All RRHs =	$WT_{RRH} \cdot N_{RRH} = 74$	lbs

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Ericsson 4415		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRH} := 16.5$	in	(User Input)
RRUS Width =	$W_{RRH} := 13.4$	in	(User Input)
RRUS Thickness =	$T_{RRH} := 5.9$	in	(User Input)
RRUS Weight =	$WT_{RRH} := 46$	lbs	(User Input)
Number of RRUS's =	$N_{RRH} := 1$		(User Input)

Wind Load (Front)

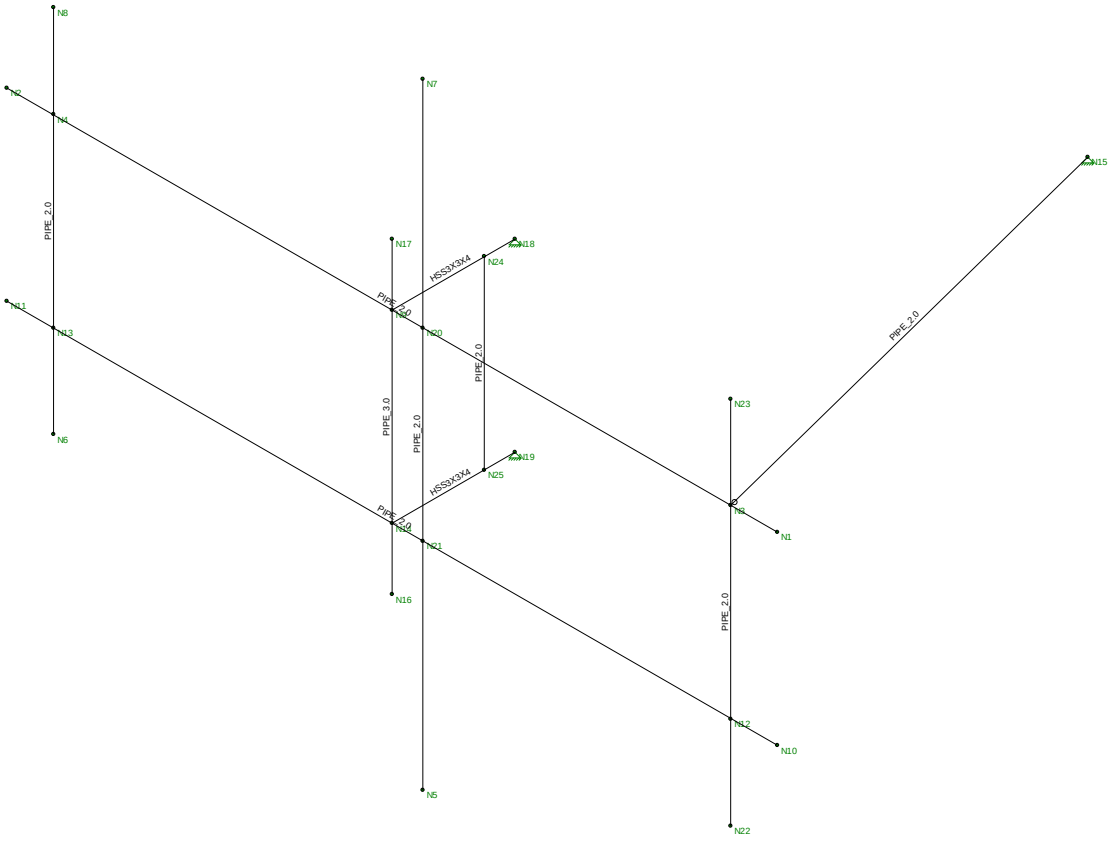
Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 1.5$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.5$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 65$	lbs

Wind Load (Side)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 0.7$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 0.7$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 29$	lbs

Gravity Load (without ice)

Weight of All RRHs =	$WT_{RRH} \cdot N_{RRH} = 46$	lbs



Envelope Only Solution

Centek		
TJL	CTNH354A - Mount	Sept 4, 2020 at 8:44 AM
20074.94	Member Framing	Antenna Mount.r3d

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2
7	A500 Gr. C	29000	11154	.3	.65	.49	50	1.5	62	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Stabilizer Arm	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
3	Horizontal	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Outrigger	HSS3X3X4	Beam	Tube	A500 Gr.46	Typical	2.44	3.02	3.02	5.08
5	Pipe 3.0	PIPE_3.0	Column	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Horizontal	12.5			Lbyy		6				Lateral
2	M2	Antenna Mast	6			Lbyy						Lateral
3	M3	Antenna Mast	10			Lbyy						Lateral
4	M4	Horizontal	12.5			Lbyy		6				Lateral
5	M5	Stabilizer Arm	8.044			Lbyy						Lateral
6	M6	Pipe 3.0	5			Lbyy						Lateral
7	M7	Outrigger	2			Lbyy						Lateral
8	M8	Outrigger	2			Lbyy						Lateral
9	M9	Antenna Mast	6			Lbyy						Lateral
10	M10	Antenna Mast	3									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N2	N1			Horizontal	Beam	Pipe	A53 Gra...	Typical
2	M2	N8	N6			Antenna Mast	Column	Pipe	A53 Gra...	Typical
3	M3	N7	N5			Antenna Mast	Column	Pipe	A53 Gra...	Typical
4	M4	N11	N10			Horizontal	Beam	Pipe	A53 Gra...	Typical
5	M5	N3	N15			Stabilizer Arm	Beam	Pipe	A53 Gra...	Typical
6	M6	N16	N17			Pipe 3.0	Column	Pipe	A53 Gra...	Typical
7	M7	N9	N18			Outrigger	Beam	Tube	A500 Gr...	Typical
8	M8	N14	N19			Outrigger	Beam	Tube	A500 Gr...	Typical
9	M9	N23	N22			Antenna Mast	Column	Pipe	A53 Gra...	Typical
10	M10	N24	N25			Antenna Mast	Column	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	6.25	1.5	2	0	
2	N2	-6.25	1.5	2	0	
3	N3	5.5	1.5	2	0	
4	N4	-5.5	1.5	2	0	
5	N5	.5	-5	2	0	
6	N6	-5.5	-3	2	0	
7	N7	.5	5	2	0	
8	N8	-5.5	3	2	0	
9	N9	0	1.5	2	0	
10	N10	6.25	-1.5	2	0	
11	N11	-6.25	-1.5	2	0	
12	N12	5.5	-1.5	2	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
13	N13	-5.5	-1.5	2	0	
14	N14	0	-1.5	2	0	
15	N15	3.5	1.5	-5.791667	0	
16	N16	0	-2.5	2	0	
17	N17	0	2.5	2	0	
18	N18	0	1.5	0	0	
19	N19	0	-1.5	0	0	
20	N20	.5	1.5	2	0	
21	N21	.5	-1.5	2	0	
22	N22	5.5	-3	2	0	
23	N23	5.5	3	2	0	
24	N24	0	1.5	.5	0	
25	N25	0	-1.5	.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N9						
2	N14						
3	N15	Reaction	Reaction	Reaction			
4	N18	Reaction	Reaction	Reaction			
5	N19	Reaction	Reaction	Reaction			
6	N20						
7	N21						
8	N24						
9	N25						

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	Y	-.077	.5
2	M3	Y	-.077	7.5
3	M9	Y	-.067	.5
4	M9	Y	-.067	5.5
5	M2	Y	-.052	.5
6	M2	Y	-.052	3.5
7	M3	Y	-.046	%50
8	M3	Y	-.074	2

Member Point Loads (BLC 3 : Wind Load X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	X	.123	.5
2	M3	X	.123	7.5
3	M9	X	.073	.5
4	M9	X	.073	5.5
5	M2	X	.041	.5
6	M2	X	.041	3.5
7	M3	X	.029	%50
8	M3	X	.046	2

Member Point Loads (BLC 4 : Wind Load Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	Z	.341	.5
2	M3	Z	.341	7.5
3	M9	Z	.108	.5
4	M9	Z	.108	5.5
5	M2	Z	.101	.5
6	M2	Z	.101	3.5
7	M3	Z	.065	%50
8	M3	Z	.058	2

Member Distributed Loads (BLC 3 : Wind Load X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.009	.009	0	0
2	M3	X	.009	.009	0	0
3	M5	X	.009	.009	0	0
4	M6	X	.009	.009	0	0
5	M7	X	.009	.009	0	0
6	M8	X	.009	.009	0	0
7	M9	X	.009	.009	0	0

Member Distributed Loads (BLC 4 : Wind Load Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.009	.009	0	0
2	M4	Z	.009	.009	0	0
3	M6	Z	.009	.009	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					8			
3	Wind Load X	WLX					8	7		
4	Wind Load Z	WLZ					8	3		

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	IBC 16-8	Yes	Y		DL	1																				
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1																
3	IBC 16-12 (a) (a)	Yes	Y		DL	1	W...	.6																		
4	IBC 16-12 (a) (b)	Yes	Y		DL	1	W...	.6																		
5	IBC 16-12 (a) (c)	Yes	Y		DL	1	W...	-.6																		
6	IBC 16-12 (a) (d)	Yes	Y		DL	1	W...	-.6																		
7	IBC 16-13 (a) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75														
8	IBC 16-13 (a) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75														
9	IBC 16-13 (a) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75														
10	IBC 16-13 (a) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75														
11	IBC 16-15 (a)	Yes	Y		DL	.6	W...	.6																		
12	IBC 16-15 (b)	Yes	Y		DL	.6	W...	.6																		
13	IBC 16-15 (c)	Yes	Y		DL	.6	W...	-.6																		

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
14	IBC 16-15 (d)	Yes	Y		DL	.6	W...	-.6																		

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N15	max	.032	3	.015	5	.203	11	0	14	0	14	0	14
2		min	-.03	5	.008	11	-.205	5	0	1	0	1	0	1
3	N18	max	.335	13	.454	4	.308	14	0	14	0	14	0	14
4		min	-.549	3	.162	14	-1.094	4	0	1	0	1	0	1
5	N19	max	.288	5	.453	6	.731	6	0	14	0	14	0	14
6		min	-.076	11	.161	12	.061	12	0	1	0	1	0	1
7	Totals:	max	.54	13	.782	10	.896	14						
8		min	-.54	3	.469	11	-.896	4						

Envelope Joint Displacements

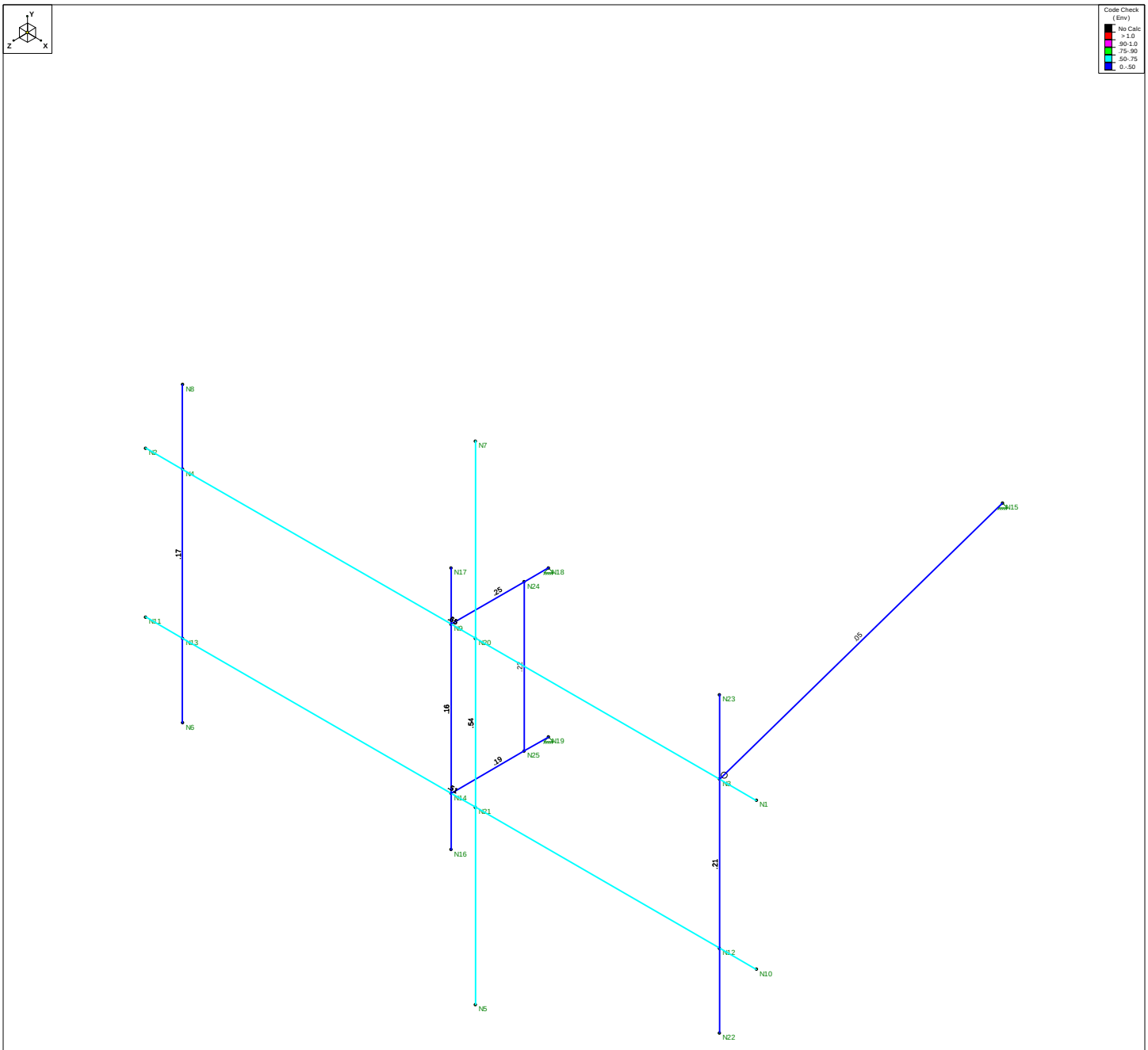
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	.356	3	-.115	13	.055	13	5.078e-03	3	3.461e-03	13	-3.938e-04	13
2		min	-.333	13	-.324	3	-.061	3	-5.241e-03	5	-3.463e-03	11	-2.692e-03	3
3	N2	max	.355	3	-.038	11	1.068	4	2.981e-03	4	1.721e-02	12	7.68e-04	5
4		min	-.334	13	-.172	5	-1.079	14	-2.029e-03	14	-1.754e-02	14	-5.411e-04	11
5	N3	max	.356	3	-.111	13	.086	13	5.078e-03	3	3.461e-03	13	-3.923e-04	13
6		min	-.333	13	-.3	3	-.092	3	-5.241e-03	5	-3.463e-03	11	-2.689e-03	3
7	N4	max	.355	3	-.043	11	.914	4	2.981e-03	4	1.721e-02	12	7.656e-04	5
8		min	-.334	13	-.166	5	-.922	14	-2.029e-03	14	-1.753e-02	14	-5.426e-04	11
9	N5	max	.283	11	-.016	13	.079	13	2.362e-03	6	1.068e-02	11	-6.108e-04	11
10		min	-.411	5	-.038	3	-.091	3	-2.054e-03	12	-1.101e-02	5	-1.878e-03	5
11	N6	max	.307	11	-.043	11	.85	11	2.644e-03	4	1.621e-02	12	6.422e-04	5
12		min	-.326	5	-.166	5	-.879	5	-1.694e-03	14	-1.664e-02	6	-4.219e-04	11
13	N7	max	.588	3	-.016	13	.369	4	1.21e-02	4	1.019e-02	3	4.131e-03	13
14		min	-.462	13	-.039	3	-.355	14	-1.175e-02	14	-9.89e-03	13	-6.623e-03	3
15	N8	max	.365	3	-.043	11	.972	4	3.282e-03	4	1.721e-02	12	9.179e-04	5
16		min	-.349	13	-.166	5	-.963	14	-2.33e-03	14	-1.753e-02	14	-6.946e-04	11
17	N9	max	.355	3	-.014	14	0	4	8.756e-04	4	1.354e-02	3	8.422e-05	13
18		min	-.333	13	-.029	4	0	14	-5.132e-05	14	-1.298e-02	13	-1.216e-03	3
19	N10	max	.314	11	-.119	13	.283	5	5.072e-03	11	2.565e-03	6	-8.392e-04	13
20		min	-.338	5	-.32	3	-.284	3	-5.232e-03	5	-2.39e-03	12	-2.248e-03	3
21	N11	max	.314	11	-.039	11	.976	11	2.644e-03	4	1.621e-02	12	6.747e-04	5
22		min	-.337	5	-.172	5	-1.01	6	-1.694e-03	14	-1.664e-02	6	-4.505e-04	11
23	N12	max	.314	11	-.111	13	.292	5	5.072e-03	11	2.561e-03	6	-8.377e-04	13
24		min	-.338	5	-.3	3	-.291	3	-5.232e-03	5	-2.386e-03	12	-2.246e-03	3
25	N13	max	.314	11	-.043	11	.858	11	2.644e-03	4	1.621e-02	12	6.723e-04	5
26		min	-.337	5	-.166	5	-.868	5	-1.694e-03	14	-1.664e-02	6	-4.519e-04	11
27	N14	max	.314	11	-.014	14	0	12	6.208e-04	6	1.268e-02	11	1.121e-04	13
28		min	-.338	5	-.029	4	0	6	2.048e-04	12	-1.329e-02	5	-1.237e-03	3
29	N15	max	0	14	0	14	0	14	3.401e-03	3	4.932e-03	3	-1.212e-03	11
30		min	0	1	0	1	0	1	1.132e-03	13	-4.692e-03	13	-3.131e-03	5
31	N16	max	.303	11	-.014	14	-.002	12	6.227e-04	6	1.268e-02	11	1.101e-04	13
32		min	-.34	5	-.029	4	-.008	6	2.028e-04	12	-1.329e-02	5	-1.235e-03	3
33	N17	max	.37	3	-.014	14	.011	4	8.776e-04	4	1.354e-02	3	8.618e-05	13
34		min	-.334	13	-.029	4	0	14	-5.328e-05	14	-1.298e-02	13	-1.218e-03	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
35	N18	max	0	14	0	14	0	14	1.365e-03	4	1.536e-02	3	5.824e-05	13
36		min	0	1	0	1	0	1	7.414e-04	14	-1.431e-02	13	-8.584e-04	3
37	N19	max	0	14	0	14	0	14	1.425e-03	4	1.328e-02	11	8.041e-05	13
38		min	0	1	0	1	0	1	6.82e-04	14	-1.443e-02	5	-8.746e-04	3
39	N20	max	.355	3	-.015	13	.068	13	2.528e-03	4	1.019e-02	3	1.39e-04	13
40		min	-.333	13	-.039	3	-.07	3	-2.207e-03	14	-9.89e-03	13	-2.603e-03	3
41	N21	max	.314	11	-.016	13	.073	5	1.359e-03	6	1.068e-02	11	-4.896e-04	13
42		min	-.338	5	-.038	3	-.07	11	-1.046e-03	12	-1.101e-02	5	-1.959e-03	3
43	N22	max	.291	11	-.111	13	.386	5	5.07e-03	11	2.561e-03	6	-1.084e-03	13
44		min	-.371	5	-.3	3	-.382	3	-5.228e-03	5	-2.386e-03	12	-1.997e-03	3
45	N23	max	.408	3	-.111	13	.024	14	5.081e-03	3	3.461e-03	13	-1.455e-04	13
46		min	-.33	13	-.3	3	-.032	4	-5.244e-03	5	-3.463e-03	11	-2.938e-03	3
47	N24	max	.092	3	-.004	14	0	4	1.249e-03	4	1.522e-02	3	5.824e-05	13
48		min	-.086	13	-.008	4	0	14	7.e-04	14	-1.422e-02	13	-8.584e-04	3
49	N25	max	.08	11	-.004	14	0	12	1.344e-03	4	1.326e-02	11	8.041e-05	13
50		min	-.087	5	-.009	4	0	6	6.052e-04	14	-1.435e-02	5	-8.746e-04	3

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...			Pnc/...	Pnt/o...	Mnyy...	Mnzz...	Cb	Eqn
1	M1	PIPE_2.0	.653	6.25	6	.471	6.25		6	4.189	21.377	1.245	1.245	1.9...	H3-6
2	M3	PIPE_2.0	.539	3....	4	.049	6....		5	6.545	21.377	1.245	1.245	4.9...	H1-...
3	M4	PIPE_2.0	.510	6.25	4	.291	6.25		4	4.189	21.377	1.245	1.245	1.9...	H3-6
4	M7	HSS3X3X4	.248	0	3	.049	1.5	z	3	65.138	67.21	5.693	5.693	1.88	H1-...
5	M10	PIPE_2.0	.218	3	4	.092	0		3	19.191	21.377	1.245	1.245	2.2...	H1-...
6	M9	PIPE_2.0	.214	1.5	3	.104	1.5		3	13.883	21.377	1.245	1.245	1.5...	H1-...
7	M8	HSS3X3X4	.188	0	5	.042	1.5	y	4	65.138	67.21	5.693	5.693	1.8...	H1-...
8	M2	PIPE_2.0	.169	1.5	5	.050	3.5		4	13.883	21.377	1.245	1.245	1.5...	H1-...
9	M6	PIPE_3.0	.162	3....	4	.068	1....		3	37.949	43.383	3.825	3.825	1.64	H1-...
10	M5	PIPE_2.0	.051	4....	3	.004	0		5	9.84	21.377	1.245	1.245	1.1...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CTNH354A - Mount	Sept 4, 2020 at 8:43 AM
20074.94	Unity Check	Antenna Mount.r3d