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

VIA ELECTRONIC MAIL

January 20, 2022

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

RE: **EM-VER-148-211008** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 37 North Main Street, Wallingford, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of January 19, 2022 submitted in response to the Council's November 19, 2021 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/CMW/emr

From: Mayo, Rachel <rmayo@RC.com>
Sent: Wednesday, January 19, 2022 11:32 AM
To: Bachman, Melanie <Melanie.Bachman@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Danielle Sabourin <DSabourin@airosmithdevelopment.com>; Andrea Armstrong (aarmstrong@airosmithdevelopment.com) <aarmstrong@airosmithdevelopment.com>; Baldwin, Kenneth <KBALDWIN@RC.com>; Mayo, Rachel <rmayo@RC.com>
Subject: EM-VER-148-211008

Good morning, please see the full Structural Analysis requested in the Council's incomplete notice (attached).

Please let us know if you have any questions or need additional information.

Thank you

Rachel A. Mayo
Land Use Analyst

Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103
Direct 860.275.8213 | Fax 860.275.8299
rmayo@rc.com | Bio | V-Card

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mounting Assemblies

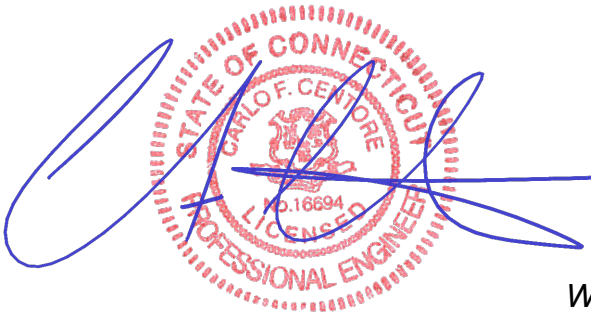
Proposed Verizon
Antenna Upgrade

Site Ref: Wallingford 4 CT

37 North Main St
Wallingford, CT

CENTEK Project No. 21007.42

Date: January 19, 2022



Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

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

Table of Contents

Introduction

This structural analysis report (SAR) was prepared to address the structural viability of installing Verizon's proposed antenna inside the existing FRP enclosures mounted atop the existing structure's rooftop located at 37 N Main Street, Wallingford, Connecticut.

The host structure geometry and member size information was gathered through a site visit to investigate the current conditions, performed by Centek personnel on 01/05/2022. The existing structure roof framing consists of roof rafters supported by wood trusses which bear on the building's exterior brick masonry walls. Verizon's existing antenna mounting assembly consists of a pipe mast with RF transparent enclosure that is supported by a deep timber truss and the existing brick masonry exterior wall. The structural loading utilized for the proposed/existing antennas and appurtenances is based on the RF data sheet dated 09/08/2021 provided by Verizon.

Primary Assumptions Used in the Analysis

- The host structure's theoretical capacity not including any assessment of the condition of the host structure.
- The existing elevated steel antenna frames carry the horizontal and vertical loads due to the weight of equipment, and wind and transfers into host structure.
- Structure is in plumb condition.
- Loading for equipment and enclosure as listed in this report.

Antenna and Equipment Summary

Location	Appurtenance / Equipment	Antenna Rad Center Elevation (AGL)	Mount Type
Alpha Sector	~~(1) Andrew SBNHH-1D65B Antenna~~ ~~(2) Nokia RRU Models~~ **(1) JMA Wireless MX14FIT665-01 Antenna** **(1) Commscope SDX1926Q-43 diplexers** **(1) Samsung RF4439d-25A RRU** **(1) Samsung RF4440d-13A RRU** **(1) Samsung RT-8808-77A RRU**	66-ft	Antenna Mounts inside FRP enclosures
Beta Sector	~~(1) Andrew SBNHH-1D65B~~ ~~(2) Nokia RRU Models~~ **(1) JMA Wireless MX14FIT665-01** **(1) Commscope SDX1926Q-43 diplexers** **(1) Samsung RF4439d-25A** **(1) Samsung RF4440d-13A** **(1) Samsung RT-8808-77A**	66-ft	Antenna Mounts inside FRP enclosures
Gamma Sector	~~(1) Andrew SBNHH-1D65B~~ ~~(2) Nokia RRU Models~~ **(1) JMA Wireless MX14FIT665-01** **(1) Commscope SDX1926Q-43 diplexers** **(1) Samsung RF4439d-25A** **(1) Samsung RF4440d-13A** **(1) Samsung RT-8808-77A**	66-ft	Antenna Mounts inside FRP enclosures

~~Equipment~~ – Indicates equipment to be removed.
Equipment – Indicates equipment to be installed.

Analysis

The antenna mounting assemblies were analyzed using a comprehensive computer program titled Risa3D. The program analyzes the proposed antenna enclosures considering the worst-case code prescribed loading condition. The structures were considered to be loaded by concentric forces, and the model assumes that the members are subjected to bending, axial, and shear forces.

Design Loading

Loading was determined per the requirements of the 2015 International Building Code amended by the 2018 CSBC and ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures".

Wind Speed:	V_{ult} = 125 mph	*Appendix N of the 2018 CT State Building Code*
Risk Category:	II	*2015 IBC; Table 1604.05*
Exposure Category:	Surface Roughness B	*ASCE 7-10; Section 26.7.2*
Ground Snow Load	30 psf	*Appendix N of the 2018 CT State Building Code*
Dead Load	Equipment and framing self-weight	*Identified within SAR design calculations*

Reference Standards

2015 International Building Code:

1. ANSI/AWC NDS-2015, National Design Specifications (NDS) for Wood Construction – with 2012 Supplement.
2. AISC 360-10, Specification for Structural Steel Buildings
3. AWS D1.1 – 00, Structural Welding Code – Steel.
4. ICC/IEBC 2015, International Existing Building Code

Results

Member stresses and design reactions were calculated utilizing the structural analysis software RISA 3D.

The antenna mounting assembly and impacted host building components were found to be structurally acceptable as presented in the following table:

Sectors	Component	Stress Ratio (percentage of capacity)	Result
All Sectors	Pipe 4.0 STD (Antenna Mast)	19%	**PASS**
	HSS6X6X4 (Horz Mount Member)	6%	**PASS**
	1/2" Threaded Rod w/ Hilti HY20 (Connection to Exterior Brick Wall)	14.5%	**PASS**
	Existing Timber Truss	(see Note 1)	**PASS**
	Brick Masonry Wall	(see Note 2)	**PASS**

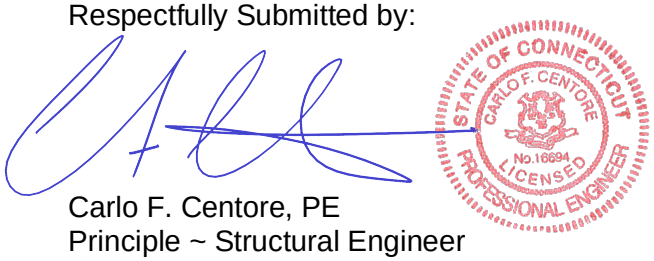
Notes:
1. % increase by the Verizon installation on the existing timber truss was determined to be less than 5% and found to be acceptable per IEBC 2015, Section 807.4.
2. Mast load on the wall section was found to be negligible.

Conclusion

This analysis finds the subject antenna mounting assembly and impacted host building structural components to **HAVE SUFFICIENT CAPACITY** for support of the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon. If the existing conditions are different from 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:



Carlo F. Centore, PE
Principle ~ Structural Engineer

Prepared by:

Pablo Perez-Gomez
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: Equipment Load Computation

Location: Wallingford, CT

Rev. 0: 01/18/2022

Prepared by: PPG; Checked by: C.F.C.
Job No. 21107.42

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

Wind Speed =	$V := 125$	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 (GAMMA) =	$Z := 66$	ft	(User Input)	
Structure Type =	$Structuretype := Square\_Chimney$			
Structure Height =	$Height := 6.75$	ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 1.71$	ft	(User Input)	

Terrain Exposure Constants:

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

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

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

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

Integral Length Scale Factor = (Table 26.9-1)

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

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

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

Turbulence Intensity Factor = (Table 26.9-1)

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

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Subject: Equipment Load Computation

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Exposure Constant = $Z_{min} := \begin{cases} 30 & \text{if } Exp = B \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases} = 30$ (Table 26.9-1)

Exposure Coefficient = $K_z := \begin{cases} 2.01 \cdot \left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01 \cdot \left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.88$ (Table 29.3-1)

Topographic Factor = $K_{zt} := 1$ (Eq. 26.8-2)

Wind Directionality Factor = $K_d = 0.9$ (Table 26.6-1)

Velocity Pressure = $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 31.59$ (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 = $z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{else} \end{cases} = 30$ (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 = $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left(\frac{Width + Height}{L_Z}\right)^{0.63}}} = 0.969$ (Eq. 26.9-8)

Gust Response Factor = $G := 0.925 \cdot \left(\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right) = 0.907$ (Eq. 26.9-6)

Force Coefficient = $C_f = 1.349$ (Fig 29.5-1 - 29.5-3)

Wind Force = $F := q_z \cdot G \cdot C_f = 39$ psf

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Antenna Data:

Antenna Model =	JMA Wireless MX14FIT665-01		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 14.2$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 63$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 2$		(User Input)

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 126$	lbs

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Dead Load of RRU Equipment on HSS:

RRU1 Data:

RRU1 Model = Samsung RF4439d-25A

RRU1 Weight = $WT_{RRU1} := 74.7$ lbs

Number of RRUs = $N_{RRU} := 2$

Weight of All RRUs = $W_1 := WT_{RRU1} \cdot N_{RRU} = 149$ lbs

RRU2 Data:

RRU2 Model = Samsung RF4440d-13A

RRU2 Weight = $WT_{RRU2} := 70.3$ lbs

Number of RRUs = $N_{RRU} := 2$

Weight of All RRUs = $W_2 := WT_{RRU2} \cdot N_{RRU} = 141$ lbs

RRU3 Data:

RRU3 Model = Samsung RT-8808-77A

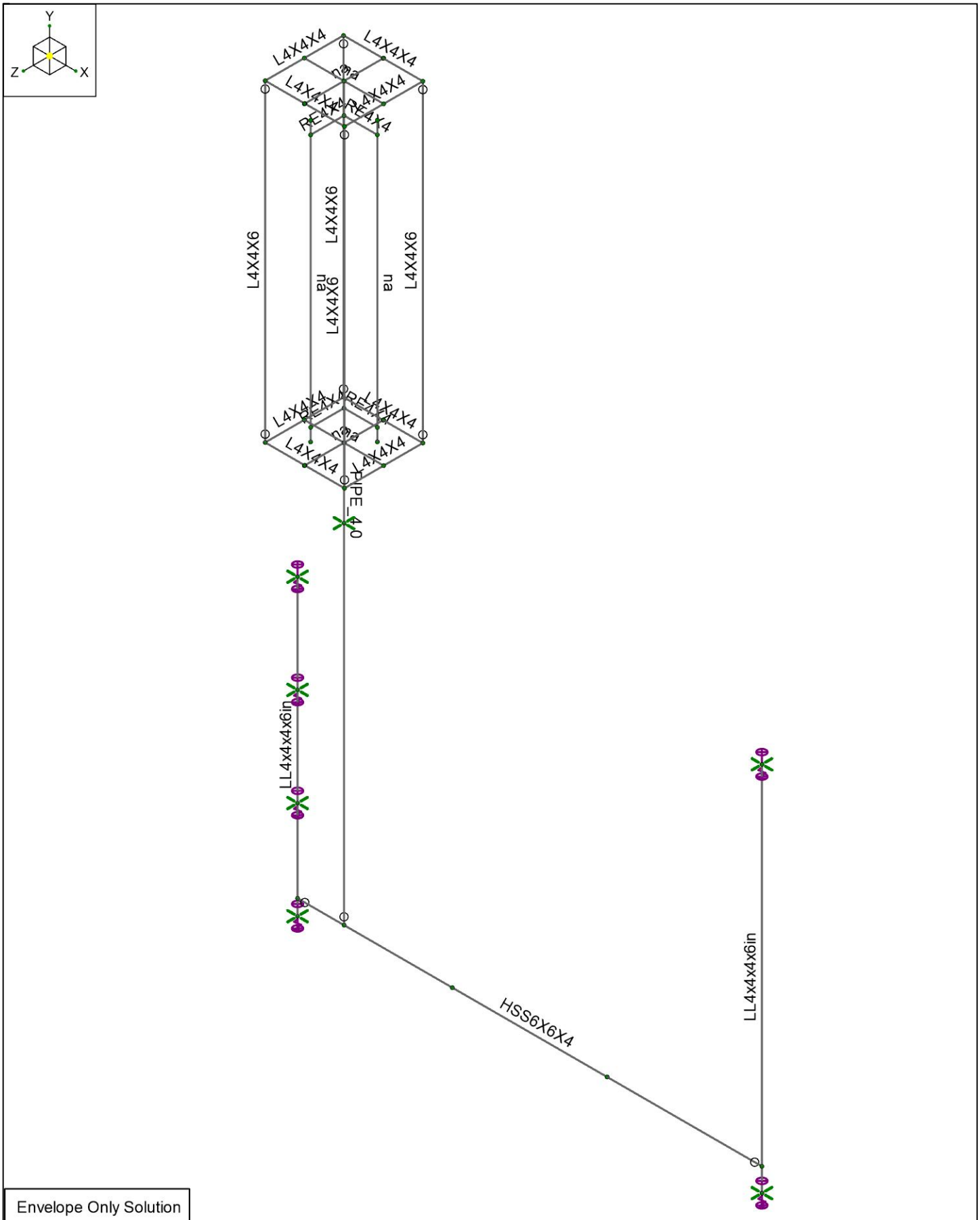
RRU3 Weight = $WT_{RRU3} := 59.5$ lbs

Number of RRUs = $N_{RRU} := 2$

Weight of All RRUs = $W_3 := WT_{RRU3} \cdot N_{RRU} = 119$ lbs

Total Weight of All RRUs = $TW := W_1 + W_2 + W_3 = 409$ lbs

Plus 15% Misc. = $TW \cdot 1.15 = 470$ lbs



Envelope Only Solution

Centek Engineering	Wallingford 4 CT - Antenna Mount Enclosure	SK-5
PPG		Jan 18, 2022
21007.42		Wallingford 4 CT_AMA Mast Struct…

Nodes

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Dia…
1	N85	0	0	140.25		
2	N86	0	0	120		
3	N87	20.5	0	140.25		
4	N88	20.5	0	120		
5	N89	10.25	0	130.125		
6	N90	10.25	-189	130.125		
7	N91	0	0	130.125		
8	N92	20.5	0	130.125		
9	N93	0	-81	140.25		
10	N94	0	-81	120		
11	N95	20.5	-81	140.25		
12	N96	20.5	-81	120		
13	N97	10.25	-81	130.125		
14	N98	0	-81	130.125		
15	N99	20.5	-81	130.125		
16	N100	10.25	-81	140.375		
17	N101	10.25	-81	119.875		
18	N102	10.25	-99	130.125		
19	N103	-1.75	-189	130.125		
20	N104	118.25	-189	130.125		
21	N105	10.25	0	140.375		
22	N106	10.25	0	119.875		
23	N107	-1.75	-167.666667	130.125		
24	N108	-1.75	-142.333333	130.125		
25	N109	-1.75	-117	130.125		
26	N110	10.25	0	120		
27	N111	10.25	0	140.25		
28	N112	10.25	-81	120		
29	N113	10.25	-81	140.25		
30	N114	10.25	-7.75	130.125		
31	N115	10.25	-73.25	130.125		
32	N116	18.875	-7.75	130.125		
33	N117	18.875	-73.25	130.125		
34	N118	10.25	-7.75	138.75		
35	N119	10.25	-73.25	138.75		
36	N120	18.875	-4.5	130.125		
37	N121	10.25	-4.5	138.75		
38	N122	18.875	-76.5	130.125		
39	N123	10.25	-76.5	138.75		
40	N124	-1.75	-193	130.125		
41	N125	118.25	-195	130.125		
42	N126	118.25	-99	130.125		
43	N43	38.25	-189	130.125		
44	N44	78.25	-189	130.125		

Boundary Conditions

	Node 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	N102	Reaction		Reaction			
2	N107	Reaction	S10	Reaction		Fixed	
3	N108	Reaction	S10	Reaction		Fixed	
4	N109	Reaction	S10	Reaction		Reaction	
5	N124	Reaction	S10	Reaction		Reaction	
6	N125	Reaction	S10	Reaction		Reaction	
7	N126	Reaction	S10	Reaction		Reaction	

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. C…	Density [k…	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.…	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.…	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1
9	FRP	2800	450	0.35	0.44	0.11	16.67	1.5	50	1.2

General Section Sets

	Label	Shape	Type	Material	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	GEN1	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+06	1e+06	1e+06	1e+06

Hot Rolled Member Properties

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp t…	Lcomp…	L-Torqu…	K y-y	K z-z	Cb	Function
1	M53	(E)L3X3…	20.5			Lbyy						Lateral
2	M54	(E)L3X3…	20.25			Lbyy						Lateral
3	M55	(E)L3X3…	20.5			Lbyy						Lateral
4	M56	(E)L3X3…	20.25			Lbyy						Lateral
5	M57	(E)Ante…	189	Segment	Segment	Lbyy						Lateral
6	M59	(E)L3X3…	20.5			Lbyy						Lateral
7	M60	(E)L3X3…	20.25			Lbyy						Lateral
8	M61	(E)L3X3…	20.5			Lbyy						Lateral
9	M62	(E)L3X3…	20.25			Lbyy						Lateral
10	M63	(E)L4X4…	81									Lateral
11	M64	(E)L4X4…	81									Lateral
12	M65	(E)L4X4…	81									Lateral
13	M66	(E)L4X4…	81									Lateral
14	M69	(E) HSS…	120			Lbyy						Lateral
15	M71	(E)2-L4…	76									Lateral
16	M78	(E)2-L4…	96			Lbyy						Lateral

Node Loads and Enforced Displacements (BLC 2 : Equipment Load)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),…	Inactive [(lb, k-ft), (in,…
1	N43	L	Y	-235	Active
2	N44	L	Y	-235	Active

Member Point Loads (BLC 2 : Equipment Load)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(in, %)]	Inactive [(lb, k-ft), (in,…
1	M76	Y	-63	%50	Active
2	M77	Y	-63	%50	Active

Member Distributed Loads (BLC 3 : Wind Load X - Direction)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […]	End Location [(…	Inactive [(lb, k-…
1	M57	X	15	15	81	99	Active

Member Distributed Loads (BLC 4 : Wind Load Z - Direction)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […]	End Location [(…	Inactive [(lb, k-…
1	M57	Z	15	15	81	99	Active

Member Distributed Loads (BLC 8 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(lb, k-…
1	M63	X	32.906	32.906	8.882e-16	81	Active
2	M64	X	32.906	32.906	8.882e-16	81	Active

Member Distributed Loads (BLC 9 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(lb, k-…
1	M53	Z	131.625	131.625	0	20.5	Active
2	M59	Z	131.625	131.625	0	20.5	Active

Member Area Loads (BLC 3 : Wind Load X - Direction)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]	Inactive [(lb,…
1	N94	N93	N85	N86	X	A-B	39	Active

Member Area Loads (BLC 4 : Wind Load Z - Direction)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [psf]	Inactive [(lb,…
1	N86	N94	N96	N88	Z	A-B	39	Active

Basic Load Cases

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
1	Self	DL		-1						
2	Equipmen…	DL				2	2			
3	Wind Loa…	WLX						1	1	
4	Wind Loa…	WLZ						1	1	
5	Snow Loa…	SL								
6	Dead Loa…	DL								
7	Wind Loa…	WLZ								
8	BLC 3 Tra…	None						2		
9	BLC 4 Tra…	None						2		

Load Combinations

	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
1	IB…	Yes	Y		DL	1																		
2	IB…	Yes	Y		DL	1	LL	1	LLS	1														
3	IB…	Yes	Y		DL	1	SL	1	SLN	1														
4	IB…	Yes	Y		DL	1	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75										
5	IB…	Yes	Y		DL	1	WLX	0.6																
6	IB…	Yes	Y		DL	1	WLZ	0.6																
7	IB…	Yes	Y		DL	1	WLX	-0.6																
8	IB…	Yes	Y		DL	1	WLZ	-0.6																
9	IB…	Yes	Y		DL	1	WLX	0.45	LL	0.75	LLS	0.75												
10	IB…	Yes	Y		DL	1	WLZ	0.45	LL	0.75	LLS	0.75												
11	IB…	Yes	Y		DL	1	WLX	-0.45	LL	0.75	LLS	0.75												
12	IB…	Yes	Y		DL	1	WLZ	-0.45	LL	0.75	LLS	0.75												
13	IB…	Yes	Y		DL	1	WLX	0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75								
14	IB…	Yes	Y		DL	1	WLZ	0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75								
15	IB…	Yes	Y		DL	1	WLX	-0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75								
16	IB…	Yes	Y		DL	1	WLZ	-0.45	LL	0.75	LLS	0.75	SL	0.75	SLN	0.75								
17	IB…	Yes	Y		DL	0.6	WLX	0.6																
18	IB…	Yes	Y		DL	0.6	WLZ	0.6																
19	IB…	Yes	Y		DL	0.6	WLX	-0.6																
20	IB…	Yes	Y		DL	0.6	WLZ	-0.6																

Node Reactions

	Node…		X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N102	max	451.212	19	0	20	455.946	20	0	20	0	20	0	20
2		min	-463.973	5	0	1	-468.679	6	0	1	0	1	0	1

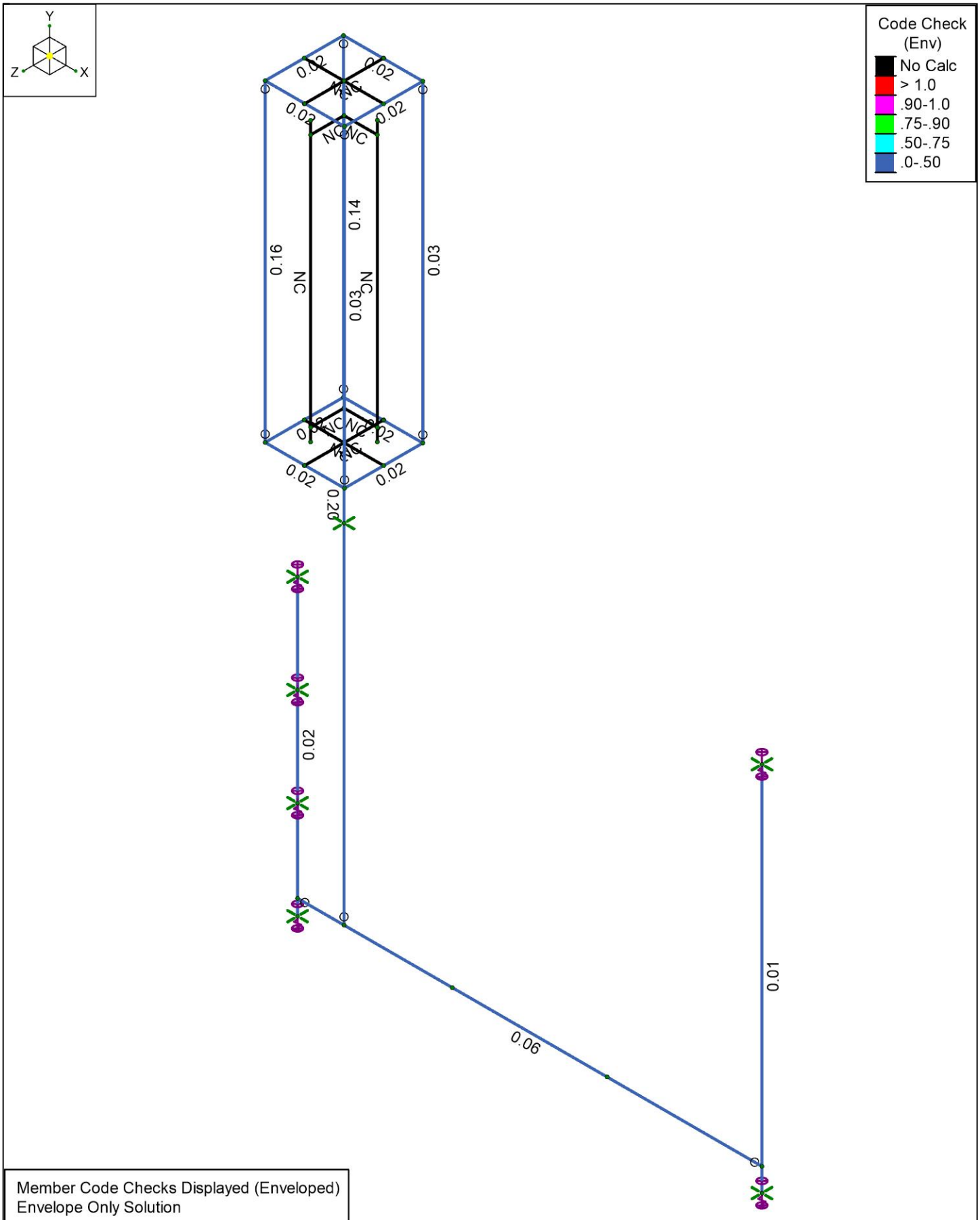
Node Reactions (Continued)

	Node…		X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
3	N107	max	40.19	5	211.769	7	35.616	6	0	20	NC	NC	0	20
4		min	-37.398	19	127.049	20	-33.169	20	0	1	NC	NC	0	1
5	N108	max	8.398	19	210.701	7	4.499	20	0	20	NC	NC	0	20
6		min	-9.024	5	126.408	20	-4.83	6	0	1	NC	NC	0	1
7	N109	max	1.343	5	210.148	7	0.138	6	0	20	0	20	0	20
8		min	-1.25	19	126.076	20	-0.129	20	0	1	0	1	0	1
9	N124	max	133.193	5	213.016	7	136.239	6	0	20	0	20	0	20
10		min	-123.952	19	127.797	20	-126.885	20	0	1	0	1	0	1
11	N125	max	17.096	5	243.037	5	17.41	6	0	20	0	20	0	20
12		min	-15.912	19	145.805	19	-16.207	20	0	1	0	1	0	1
13	N126	max	1.141	5	241.276	5	1.168	6	0	20	0	20	0	20
14		min	-1.061	19	144.748	19	-1.087	20	0	1	0	1	0	1
15	Totals:	max	280.036	7	1329.92	6	282.971	8						
16		min	-280.036	17	797.897	20	-282.946	18						

Note: Node reactions in blue are at the brick wall and in red are at the timber truss

Asd360

	Member	Shape	Code…	Loc [in]	LC	Shear…	Loc [in]	Dir	LC	Pnc/o…	Pnt/o…	Mnyy/…	Mnzz/…	Cb	Eqn
1	M53	L4X4X4	0.024	10.25	5	0.006	10.25	y	6	36698…	41604…	2.088	4.468	1.335	H2-1
2	M54	L4X4X4	0.023	10.125	6	0.006	10.125	z	6	36727…	41604…	2.088	4.468	1.343	H2-1
3	M55	L4X4X4	0.022	10.25	5	0.005	10.25	z	5	36698…	41604…	2.088	4.468	1.293	H2-1
4	M56	L4X4X4	0.021	10.125	6	0.005	10.125	y	6	36727…	41604…	2.088	4.468	1.302	H2-1
5	M57	PIPE…	0.198	98.438	6	0.015	98.438		6	61591…	62035…	7.073	7.073	1.528	H1-1b
6	M59	L4X4X4	0.024	10.25	8	0.006	10.25	z	8	36698…	41604…	2.088	4.468	1.238	H2-1
7	M60	L4X4X4	0.022	10.125	7	0.006	10.125	y	7	36727…	41604…	2.088	4.589	1.3	H2-1
8	M61	L4X4X4	0.024	10.25	5	0.006	10.25	y	6	36698…	41604…	2.088	4.589	1.354	H2-1
9	M62	L4X4X4	0.025	10.125	6	0.006	10.125	z	6	36727…	41604…	2.088	4.468	1.361	H2-1
10	M63	L4X4X6	0.139	40.5	19	0.007	81	z	5	3838.…	28548…	1.355	1.522	1.136	H2-1
11	M64	L4X4X6	0.163	40.5	7	0.007	81	y	17	3838.…	28548…	0.979	1.522	1.136	H2-1
12	M65	L4X4X6	0.033	0	6	0.000	81	y	18	3838.…	28548…	1.355	1.376	1	H2-1
13	M66	L4X4X6	0.032	0	8	0.000	81	y	6	3838.…	28548…	1.355	1.376	1	H2-1
14	M69	HSS6…	0.056	40	6	0.019	0	y	5	12086…	14433…	25.709	25.709	1.144	H1-1b
15	M71	LL4x4…	0.017	3.958	5	0.005	3.958	z	6	21092…	83532…	28.49	3.756	3	H1-1b
16	M78	LL4x4…	0.012	0	5	0.001	6	z	6	21083…	83532…	28.49	6.01	1.596	H1-1b*

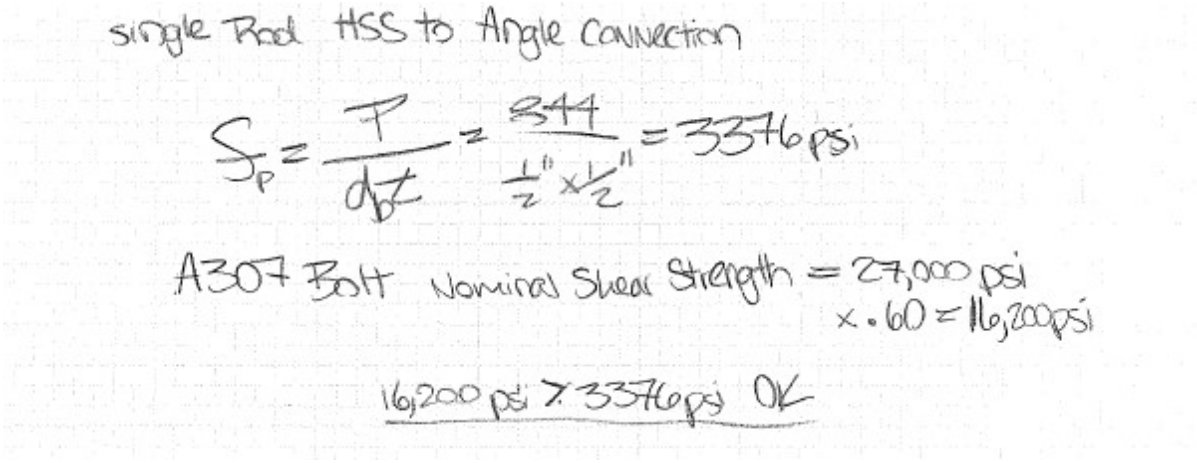


Member Code Checks Displayed (Enveloped)
Envelope Only Solution

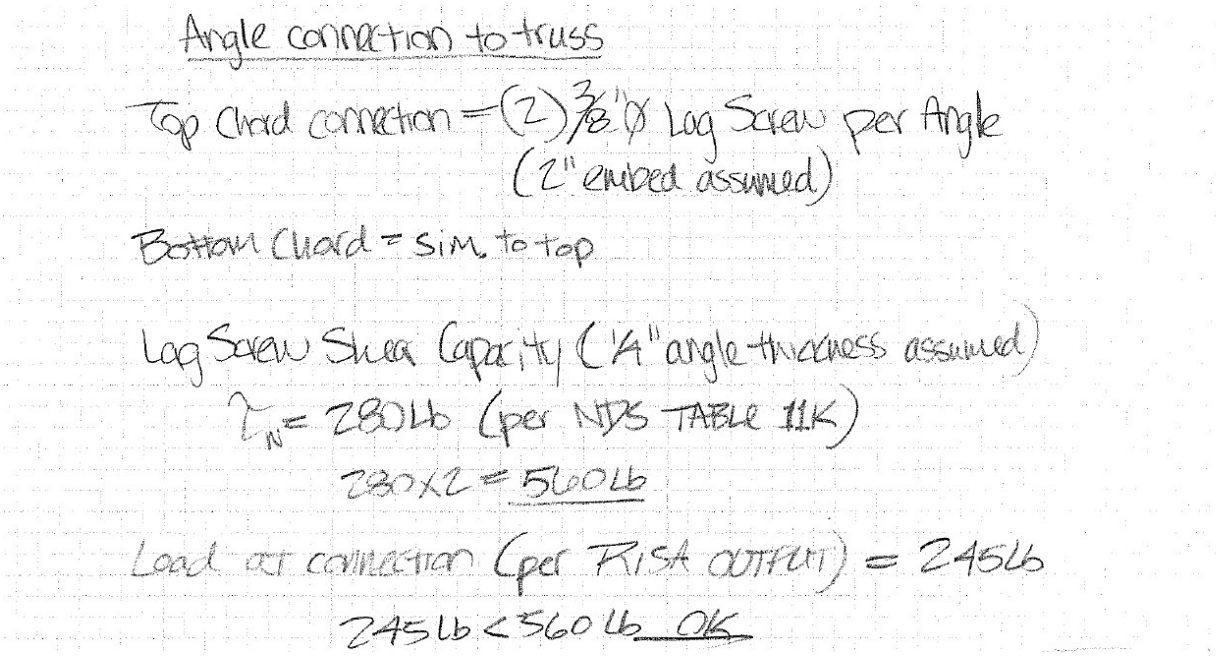
Centek Engineering	Wallingford 4 CT - Antenna Mount Enclosure	SK-4
PPG		Jan 18, 2022
21007.42		Wallingford 4 CT_AMA Mast Struct…

Antenna Frame Connection Checks

HHS Connection to Double Angle



Double Angle to Timber Truss



Antenna Frame Connection Checks

Double Angle Connection to Exterior Brick Wall

Anchor Data:

1/2" Threaded Rod with Hilti HY20 ADHESIVE

Number of Bolts =	$N := 8$	(User Input)
Spacing =	$S := 24\ in$	(User Input)
Embedment =	$Embed := 6 \cdot in$	(User Input)
Allowable Load in Tension =	$T_{all} := 745 \cdot lbf$	(User Input)
Allowable Load in Shear =	$V_{all} := 930\ lbf$	(User Input)

Design Reactions:

Shear X =	$Shear_x := .175\ kip$	(User Input)
Axial =	$Vertical := .846\ kip$	(User Input)
Shear Z =	$Shear_z := .175 \cdot kip$	(User Input)
Moment X =	$M_x := 0\ kip \cdot ft$	(User Input)
Moment Y =	$M_y := 0\ kip \cdot ft$	(User Input)
Moment Z =	$M_z := 0 \cdot kip \cdot ft$	(User Input)

Anchor Check:

Max Tension Force = $$T_{Max} := \frac{Shear_z}{N} + \frac{M_y}{\frac{N}{2} \cdot S} = 21.88\ lbf$$

Max Shear Force = $$V_{Max} := \frac{\sqrt{Vertical^2 + Shear_x^2}}{N} = 107.99\ lbf$$

Condition 1 = $$Condition1 := \text{if}\left(\frac{T_{Max}}{T_{all}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 2 = $$Condition2 := \text{if}\left(\frac{V_{Max}}{V_{all}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 3 = $$Condition3 := \text{if}\left(\frac{T_{Max}}{T_{all}} + \frac{V_{Max}}{V_{all}} \le 1.0\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

% of Capacity = $$\max\left(\frac{T_{Max}}{T_{all}}, \frac{V_{Max}}{V_{all}}, \left(\frac{\frac{T_{Max}}{T_{all}} + \frac{V_{Max}}{V_{all}}}{1.0}\right)\right) = 14.5\%$$

Subject: Existing Load Computation Applied to The Host Structure
Location: Wallingford, CT
Date: 01/18/2022
Job No. 21107.42

SNOW LOADS

State	Municipality	Ground Snow Load (psf)
CT	Wallingford	30

Appendix N of the 2018 CT State Building Code

LIVE LOADS

Ocupancy	Use	Unifrom (psf)	Conc. (lbs)
Roofs	Ordinary flat, pitched, and curved roofs	20	0

Table 4-1 Minimum Uniformly Distributed Live Loads, L_o, and Minimum Concentrated Live Loads of the ASCE/SEI 7-10 Minimum Design Loads for Building and other Structures Standards

Total Roof Live Load = 20

DEAD LOADS

	Component	Material	Loading (psf)
Roof	Framing Members	2x6 Wood Studs at 24" o.c.	1.27
	Floor covering	Floor covering Hardwood (1" nominal)	4
	Roofing	1/4 in. slate	5

Total Roof Dead Load = 10.27

	Component	Material	Loading (psf)
Attic Floor	Plaster	Wood Lath, 1"	10
	Framing Members	2x6 Wood Studs at 24" o.c.	1.27

Total Roof Dead Load = 11.27

LOADING APPLIED TO RISA3D MODEL

Spacing Between Trusses = 11.1 ft

$Snow_{LL}$ on Roof = 333 plf

$Live_{LL}$ on Roof = 222 plf

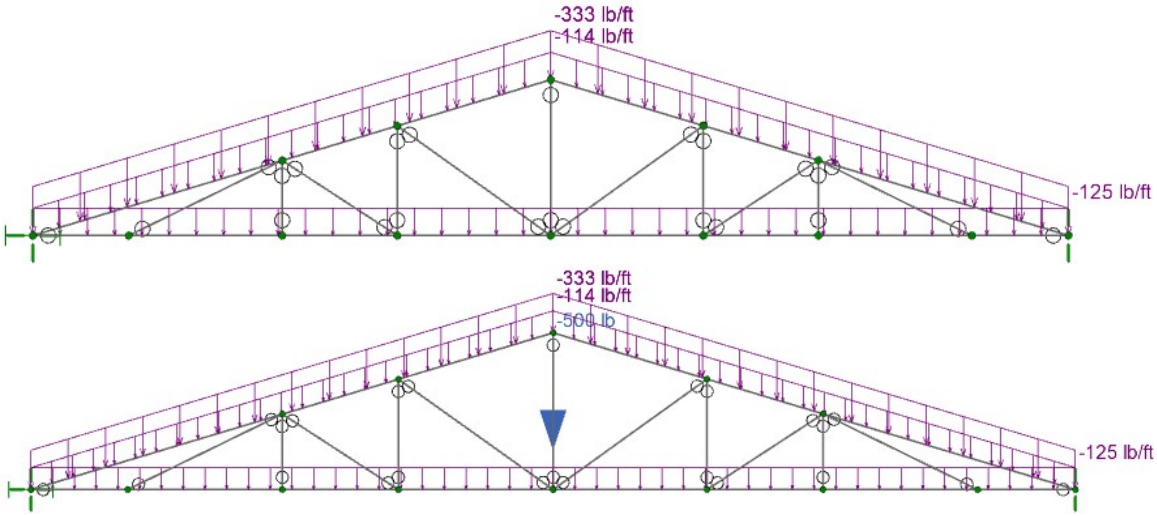
$Dead_{LL}$ on Roof = 114 plf

$Dead_{LL}$ on Attic Floor = 125 plf

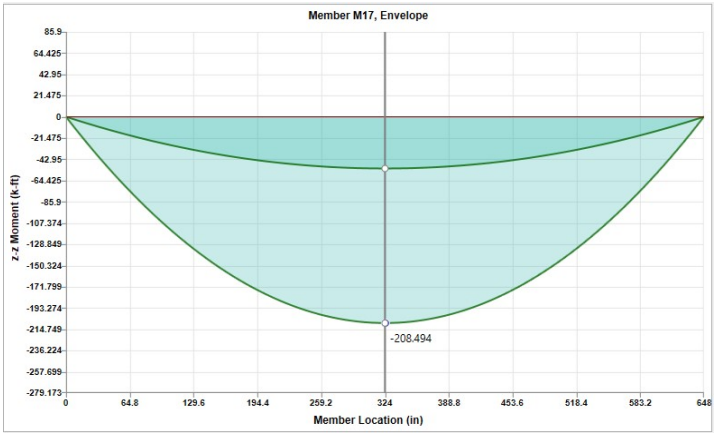
Host Building Component Check

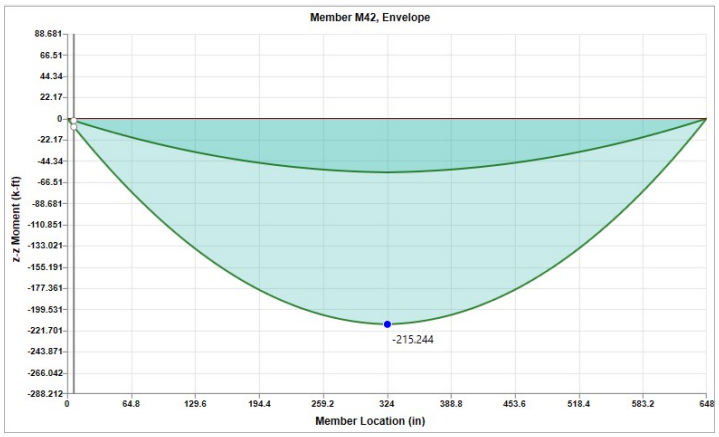
Timber Truss

Shown below are the loads applied to the timber trusses that are supporting the host building's roof structure. Reference the Existing Load Computation Applied to the Host Structure sheet for computation of these loads. The second timber truss has an additional point load applied due to the reaction forces of the antenna mount assembly being supported by the timber truss. Refrence the node reactions highlighted in red on the RISA3D Output Report.



The two Diagrams show the moments pertaining to the two truss scenerios above. On the left the truss with with existing loading gives a max moment of 208.5 k-ft. On the right the truss with existing loading plus the reaction force from the atenna mount assembly gives a max moment of 215.2 k-ft.





Calculation

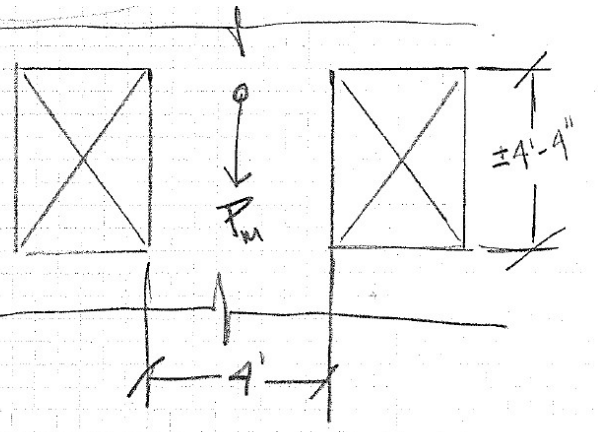
% Increase = [(215.2 – 208.5) k-ft / (208.5 k-ft)] x 100 = 3.2%

Brick Exterior Wall

Load into BRICK WALL SECTION

P_M = Load = 849 lb (From Risa3D output SUM OF NODES AT WALL)

$\sigma = \frac{P}{A} = \frac{P}{b \times t} = \frac{849}{48'' \times 12''} = 1.45 psi$



f'_M = 1,500 psi (assumed)

3 way the brick = 12" thick

.25 × 1,500 psi = 375 psi Compressive Strength

375 psi >>> 1.45 psi

Mast Load on WALL SECTION IS NEGLIGIBLE