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

May 17, 2018

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046

RE: **EM-AT&T-083-180425** – AT&T notice of intent to modify an existing telecommunications facility located at 213 Court Street, Middletown, Connecticut.

Dear Mr. Andrews:

The Connecticut Siting Council (Council) is in receipt of your email correspondence of May 16, 2018 submitted in response to the Council's May 3, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MB/CMW/jmb

From: Jack Andrews [mailto:jandrews@empiretelecomm.com]
Sent: Wednesday, May 16, 2018 5:21 PM
To: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: FW: Incomplete letter for EM-AT&T-083-180425-Courtst

Attached is revised Mounting Analysis that addresses the building's structural integrity in the second paragraph of the "conclusions" on page 4. Maser Consulting, our engineering firm, assured me that you find this sufficient.

3 Hard copies were mailed to you a few moments ago via first class mail. Thank you for your patience. Jack Andrews

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Mount Analysis Report

FOR

CT1017 – Middletown Corp Ctr

213 Court Street
Middletown, CT 06457
Middlesex County

LTE - 4C/5C/6C/7C

Mount Utilization: 23.6%
Connection Utilization: 24.7%
Building Utilization: ADEQUATE

May 8, 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 TSOUKALAS
32577
LICENSED
PROFESSIONAL ENGINEER

Petros E. Tsoukalas
Connecticut Professional Engineer
License No. PEN.32577

MC Project No. 17963016A

Objective:

The objective of this report is to determine the capacity of the existing antenna support mounts 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 September 01, 2015 to verify the existing condition of the structure and to located and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- RFDS 1789980 provided by Smartlink, dated November 09, 2017.
- Mount Analysis Report prepared by Maser Consulting Connecticut, Project No. 15946083A, dated December 22, 2015
- Construction Drawings prepared by Maser Consulting Connecticut, Project No. 15946083A, dated August 04, 2016

The proposed **AT&T** equipment is to be supported on existing antenna support mounts constructed of structural steel antenna support pipes at a centerline of approximately 171'-0" above ground level. This report is based upon this information as well as information obtained from the field.

Appurtenances:

PROPOSED ANTENNA AND RRUS CONFIGURATION

SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	KMW AM-X-CD-16-65-00T-RET	KMW AM-X-CD-16-65-00T-RET	UMTS	REMAIN	72.00	11.80	5.90	48.50	160°	171'	(1) RRUS-B14 4478	NEW
	A2	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72.00	12.00	9.60	111.00	40°	171'	(1) RRUS-32 B2 (1) RRUS-32 (1) RRUS-E2 (AT GRADE)	REMAIN REMAIN NEW
	A3	-	-	-	-	-	-	-	-	-	-	-	-
	A4	KMW AM-X-CD-16-65-00T-RET	CCI OPA-65R-LCUU-H6	LTE	NEW	72	14.8	7.4	73	40°	171'	(1) RRUS-11 (1) RRUS-12 (AT GRADE) (1) RRUS-32 B66	REMAIN NEW NEW
BETA	B1	KMW AM-X-CD-16-65-00T-RET	KMW AM-X-CD-16-65-00T-RET	UMTS	REMAIN	72.00	11.80	5.90	48.50	270°	171'	(1) RRUS-B14 4478	NEW
	B2	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72.00	12.00	9.60	111.00	160°	171'	(1) RRUS-32 B2 (1) RRUS-32 (1) RRUS-E2 (AT GRADE)	REMAIN REMAIN NEW
	B3	-	-	-	-	-	-	-	-	-	-	-	-
	B4	KMW AM-X-CD-16-65-00T-RET	CCI OPA-65R-LCUU-H6	LTE	NEW	72	14.8	7.4	73	160°	171'	(1) RRUS-11 (1) RRUS-12 (AT GRADE) (1) RRUS-32 B66	REMAIN NEW NEW
GAMMA	C1	KMW AM-X-CD-16-65-00T-RET	KMW AM-X-CD-16-65-00T-RET	UMTS	REMAIN	72.00	11.80	5.90	48.50	40°	171'	(1) RRUS-B14 4478	SHARED WITH BETA SECTOR
	C2	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72.00	12.00	9.60	111.00	270°	171'	(1) RRUS-32 B2 (1) RRUS-32 (1) RRUS-E2 (AT GRADE)	REMAIN REMAIN NEW
	C3	-	-	-	-	-	-	-	-	-	-	-	-
	C4	KMW AM-X-CD-16-65-00T-RET	CCI OPA-65R-LCUU-H6	LTE	NEW	72	14.8	7.4	73	270	171'	(1) RRUS-11 (1) RRUS-12 (AT GRADE) (1) RRUS-32 B66	REMAIN NEW NEW

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, incorporating the 2012 IBC
- ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures
  - Ultimate Wind Speed – 125 mph (3 Second Gust)
  - Exposure Category – C
  - Risk Category – II
  - Topographic Category – 1
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing antenna support mounts are structurally adequate to support the proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Risa-3D, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing antenna support mounts.

The existing antenna mounts in position 4 in all the sectors has been modeled in RISA-3D, 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. The program performs checks based on the steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

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.
- 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:

The following design parameters have been utilized in this report:

- *Structural Steel Angles are constructed of A36 Steel*
- *Structural Steel Pipes are constructed of A53 Grade B Steel*
- *Existing connections were assumed as follows:*
  - *1/2" ø HIT-A Rod Anchor*
  - *Use Hilti-HY 20 Adhesive*
  - *Have minimum embedment of 3-3/8" into hollow bricks*

Note about Equipment:

- *All proposed antennas shall be mounted to the existing pipe mounts in position 4 of all sectors.*
- *The proposed TMAs shall be mounted behind proposed antennas on the same pipe mounts*
- *All proposed RRHs shall be mounted on the ground level.*

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing antenna support mounts have **ADEQUATE** structural capacity to support the proposed loading. The existing antenna support mounts and their connections have been determined to be stressed to a maximum of **23.6%** and **24.7%** of their structural capacity. Therefore, the proposed **AT&T** installation **CAN** be installed as intended.

By engineering comparison, the existing structure is **ADEQUATE** to support the proposed loading in the final configuration without causing an overstress condition on the existing building structure. Please see the final Maser Consulting Connecticut construction drawings for mounting details.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the existing structural members supporting the proposed **AT&T** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure.

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

Tapan Pandey, E.I.T.
Structural Engineer

\\maserconsulting.com\luj\Projects\2017\17963000A\17963016A\Structural\Mount Analysis\Rev 1\Word\10035254.CTL01017.Middletown Corp Ctr.Mount Analysis.Rev 0.docx

MASER
CONSULTING P.A.

APPENDIX A

Site Information:

ASCE 7-10 Reference

Location: **Middletown, CT**

Building Height: $h_{roof} := 212 \cdot ft$

Building Width: $B := 225 \cdot ft$

Risk Category: Risk_Category := II (Table 1.5-1)

Design Wind Load:

Equipment Centerline: $z := 171$ ft

Ultimate Wind Speed: $V := 125$ *mph* (Figure 26.5-1(A, B or C))

Wind Directionality Factor: $K_d :=$ 0.85 (Section 26.6 and Table 26.6-1)

Exposure Category: Exp := C (Section 26.7)

Topographic Category: Topo := No Topo (Section 26.8.1)

Height of Hill: $H := 0 \cdot ft$

Distance Upwind of Crest to Half the Height of the Hill: $L_h := 0 \cdot ft$

Distance Upwind or Downwind of Crest to the Site: $x := 0 \cdot ft$

Structure Location: Structure_Location := No Topo *Relative to the Crest*

Gust Effect Factor: $G_h := 1.0$ (Section 26.9)

Terrain Exposure Constants: (Table 26.9.1)

$$\alpha := \begin{cases} 7.0 & \text{if } Exp = \text{"B"} \\ 9.5 & \text{if } Exp = \text{"C"} \\ 11.5 & \text{if } Exp = \text{"D"} \end{cases} \qquad Z_g := \begin{cases} 1200 & \text{if } Exp = \text{"B"} \\ 900 & \text{if } Exp = \text{"C"} \\ 700 & \text{if } Exp = \text{"D"} \end{cases}$$

$$K_{zmin} := \begin{cases} 0.70 & \text{if } Exp = \text{"B"} \\ 0.85 & \text{if } Exp = \text{"C"} \\ 1.03 & \text{if } Exp = \text{"D"} \end{cases}$$

Velocity Pressure Coefficient: Table 29.3-1

$$Kz(z) := \begin{array}{|l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g}\right)^{\frac{2}{\alpha}}, K_{zmin}\right] \text{ if } z \ge 15 \wedge z \le Z_g \\ K_z \leftarrow \max\left[2.01 \cdot \left(\frac{15}{Z_g}\right)^{\frac{2}{\alpha}}, K_{zmin}\right] \text{ if } z < 15 \\ K_z \leftarrow \min(K_z, 2.01) \end{array}$$

$Kz(z) = 1.417$

Topographic Factor: (Table 26.8-1)

Height Attenuation Factor

$$\gamma := \begin{cases} 3.0 & \text{if } Topo = \text{"2"} \\ 2.5 & \text{if } Topo = \text{"3"} \\ 4.0 & \text{if } Topo = \text{"4"} \\ 1.0 & \text{otherwise} \end{cases}$$

Horizontal Attenuation Factor

$$\mu := \begin{cases} 1.5 & \text{if } Structure\_Location = \text{"Upwind"} \\ \text{if } Structure\_Location = \text{"Downwind"} & \begin{cases} 1.5 & \text{if } Topo = \text{"2"} \\ 4.0\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"3"} \\ 1.5\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"4"} \end{cases} \\ 1.0 & \text{otherwise} \end{cases}$$

$$Kzt(z) := K_{zt} \leftarrow \begin{cases} 1.0 & \text{if } Topo = \text{"1"} \\ \text{otherwise} & \end{cases}$$

$$K_1 \leftarrow \begin{cases} \text{if } Exp = \text{"B"} & \begin{cases} 1.30\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"2"} \\ 0.75\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"3"} \\ 0.95\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"4"} \end{cases} \\ \text{if } Exp = \text{"C"} & \begin{cases} 1.45\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"2"} \\ 0.85\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"3"} \\ 1.05\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"4"} \end{cases} \\ \text{if } Exp = \text{"D"} & \begin{cases} 1.55\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"2"} \\ 0.95\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"3"} \\ 1.15\cdot\left(\frac{H}{L_h}\right) & \text{if } Topo = \text{"4"} \end{cases} \end{cases}$$

$$K_2 \leftarrow 1 - \frac{|x|}{\mu\cdot L_h}$$

$$K_3 \leftarrow e^{\left(\frac{\gamma\cdot z}{L_h}\right)}$$

$$\left(1 + K_1\cdot K_2\cdot K_3\right)^2$$

Velocity Pressure: $q_z := 0.00256\cdot Kz(z)\cdot Kzt(z)\cdot K_d\cdot V^2\cdot psf = 48.2\cdot psf$ (Section 30.3.1)

Force Coefficient:

$$C_{f\_square}(h,w) := \begin{cases} 1.3 & \text{if } \frac{h}{w} \le 1.0 \\ \left[1.3 + \frac{0.1}{6.0}\cdot\left(\frac{h}{w} - 1.0\right)\right] & \text{if } \frac{h}{w} > 1.0 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Figure 29.5-1

Square Members
(Wind Normal to Face)

$$C_{f\_round}(h,d) := \begin{cases} \text{if } \frac{d}{ft}\cdot\sqrt{\frac{q_z}{psf}} \le 2.5 \\ \quad \begin{cases} 0.7 & \text{if } \frac{h}{d} \le 1.0 \\ \left[0.7 + \frac{0.1}{6.0}\cdot\left(\frac{h}{d} - 1.0\right)\right] & \text{if } \frac{h}{d} > 1.0 \wedge \frac{h}{d} \le 7 \\ \left[0.8 + \frac{0.4}{18}\cdot\left(\frac{h}{d} - 7\right)\right] & \text{if } \frac{h}{d} > 7 \wedge \frac{h}{d} \le 25 \\ 1.2 & \text{otherwise} \end{cases} \\ \text{if } \frac{d}{ft}\cdot\sqrt{\frac{q_z}{psf}} > 2.5 \\ \quad \begin{cases} 0.5 & \text{if } \frac{h}{d} \le 1.0 \\ \left[0.6 + \frac{0.1}{6.0}\cdot\left(\frac{h}{d} - 1.0\right)\right] & \text{if } \frac{h}{d} > 1.0 \wedge \frac{h}{d} \le 7 \\ \left[0.7 + \frac{0.1}{18}\cdot\left(\frac{h}{d} - 7\right)\right] & \text{if } \frac{h}{d} > 7 \wedge \frac{h}{d} \le 25 \\ 0.7 & \text{otherwise} \end{cases} \end{cases}$$

Figure 29.5-1

Round Members
(Wind Normal to Face)

Pressure Coefficient and Gust Factor Product:

$$GC_r(A_f) := \begin{cases} 1.9 & \text{if } A_f \le 0.1\cdot B\cdot h_{roof} \\ \left[1.9 - \left(\frac{A_f - 0.1\cdot B\cdot h_{roof}}{B\cdot h_{roof}}\right)\right] & \text{if } A_f > 0.1\cdot B\cdot h_{roof} \wedge A_f \le B\cdot h_{roof} \\ 1.0 & \text{otherwise} \end{cases}$$

Appurtenance Loading:

CCI OPA-65R-LCUU-H6: Front Wind

Height: $h := 72 \cdot in$

Width: $w := 14.8 \cdot in$

Area: $A_a := (h \cdot w) = 7.4\,ft^2$

Force Coefficient: $C_{f\_square}(h, w) = 1.364$

Pressure Coefficient and Gust Factor Product: $GC_r(A_a) = 1.9$

Wind Load:

$$F_{ant1.front} := \begin{cases} q_z \cdot G_h \cdot C_{f\_square}(h, w) \cdot A_a & \text{if } h_{roof} > 60 \cdot ft \\ q_z \cdot GC_r(A_a) \cdot A_a & \text{if } h_{roof} \le 60 \cdot ft \end{cases} = 486.4\,lbf$$

(Equation 29.5-1, P. 308)
(Equation 29.5-2, P. 308)

CCI OPA-65R-LCUU-H6: Side Wind

Height: $h := 72 \cdot in$

Depth: $d := 7.4 \cdot in$

Area: $A_a := (h \cdot d) = 3.7\,ft^2$

Force Coefficient: $C_{f\_square}(h, d) = 1.491$

Pressure Coefficient and Gust Factor Product: $GC_r(A_a) = 1.9$

Wind Load:

$$F_{ant1.side} := \begin{cases} q_z \cdot G_h \cdot C_{f\_square}(h, d) \cdot A_a & \text{if } h_{roof} > 60 \cdot ft \\ q_z \cdot GC_r(A_a) \cdot A_a & \text{if } h_{roof} \le 60 \cdot ft \end{cases} = 265.8\,lbf$$

(Equation 29.5-1, P. 308)
(Equation 29.5-2, P. 308)

Dead Weight: $P_{ant1} := 73 \cdot lbf$

TMA: Front Wind

Height: $h := 11.04 \cdot in$

Width: $w := 10.63 \cdot in$

Area: $A_a := (h \cdot w) = 0.815\ ft^2$

Force Coefficient: $C_{f\_square}(h, w) = 1.301$

Pressure Coefficient and Gust Factor Product: $GC_r(A_a) = 1.9$

Wind Load:

$$F_{a2.front} := \begin{cases} q_z \cdot G_h \cdot C_{f\_square}(h, w) \cdot A_a & \text{if } h_{roof} > 60 \cdot ft \\ q_z \cdot GC_r(A_a) \cdot A_a & \text{if } h_{roof} \le 60 \cdot ft \end{cases} = 51.1\ lbf$$

(Equation 29.5-1, P. 308)

(Equation 29.5-2, P. 308)

TMA: Side Wind

Height: $h := 11.04 \cdot in$

Depth: $d := 3.75 \cdot in$

Area: $A_a := (h \cdot d) = 0.287\ ft^2$

Force Coefficient: $C_{f\_square}(h, d) = 1.332$

Pressure Coefficient and Gust Factor Product: $GC_r(A_a) = 1.9$

Wind Load:

$$F_{a2.side} := \begin{cases} q_z \cdot G_h \cdot C_{f\_square}(h, d) \cdot A_a & \text{if } h_{roof} > 60 \cdot ft \\ q_z \cdot GC_r(A_a) \cdot A_a & \text{if } h_{roof} \le 60 \cdot ft \end{cases} = 18.5\ lbf$$

(Equation 29.5-1, P. 308)

(Equation 29.5-2, P. 308)

Dead Weight: $P_{a2} := 26 \cdot lbf$

Antenna Mount Loading:

2.0" Pipe Loading:

Height: $h_{m1} := 84in$

Width: $w_{m1} := 2.375 \cdot in$

Area: $A_a := h_{m1} \cdot w_{m1} = 1.385\ ft^2$

Force Coefficient: $C_f := C_{f\_round}(h_{m1}, w_{m1}) = 1.2$

Wind Load: $f_{m1} := q_z \cdot G_h \cdot C_f \cdot w_{m1} = 11.442 \cdot plf$ (Section 2.6.9.2, P. 20)

2.0" Pipe Loading:

Height: $h_{m2} := 60in$

Width: $w_{m2} := 2.375 \cdot in$

Area: $A_a := h_{m2} \cdot w_{m2} = 0.99\ ft^2$

Force Coefficient: $C_f := C_{f\_round}(h_{m2}, w_{m2}) = 1.2$

Wind Load: $f_{m2} := q_z \cdot G_h \cdot C_f \cdot w_{m2} = 11.442 \cdot plf$ (Section 2.6.9.2, P. 20)

HSS Loading:

Height: $h_{m3} := 12in$

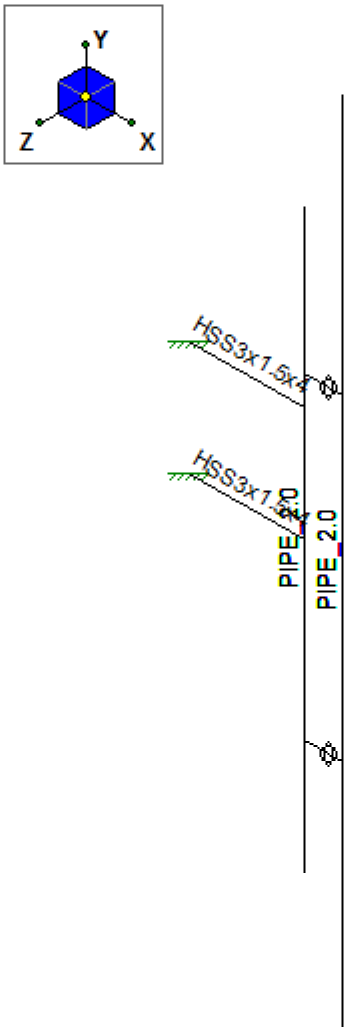
Width: $w_{m3} := 1.5 \cdot in$

Area: $A_a := h_{m3} \cdot w_{m3} = 0.125\ ft^2$

Force Coefficient: $C_f := C_{f\_square}(h_{m3}, w_{m3}) = 1.433$

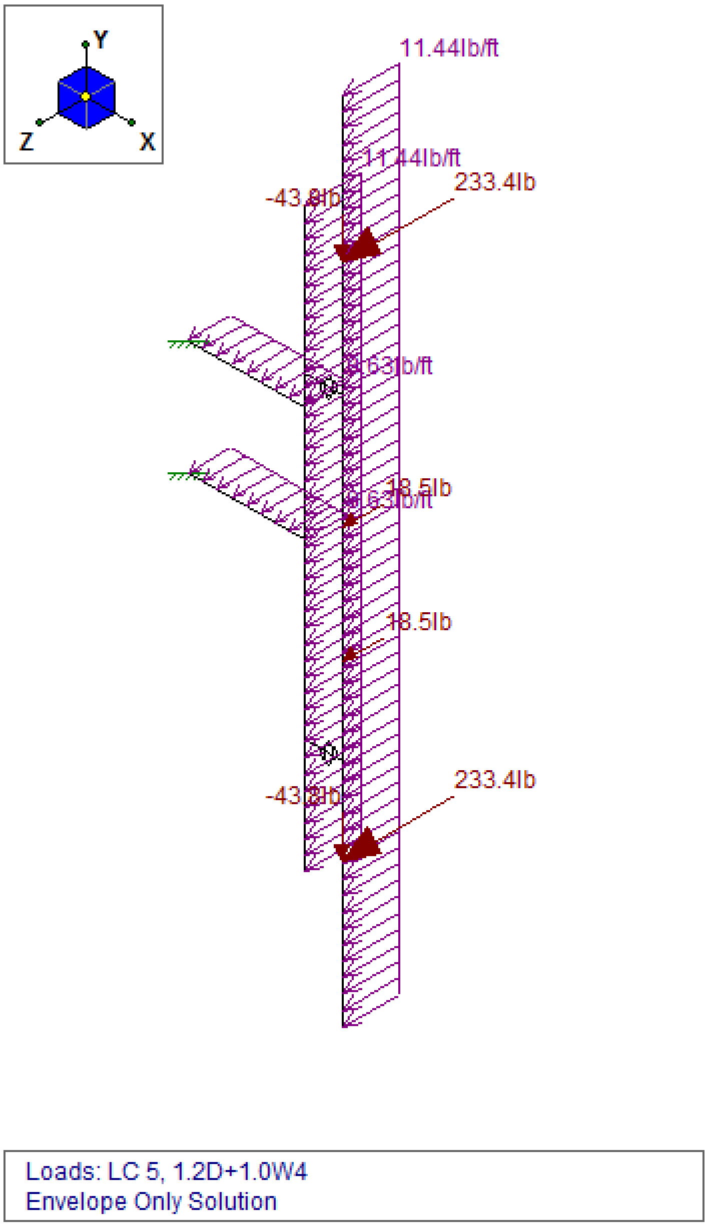
Wind Load: $f_{m3} := q_z \cdot G_h \cdot C_f \cdot w_{m3} = 8.632 \cdot plf$ (Section 2.6.9.2, P. 20)

Risa Model:

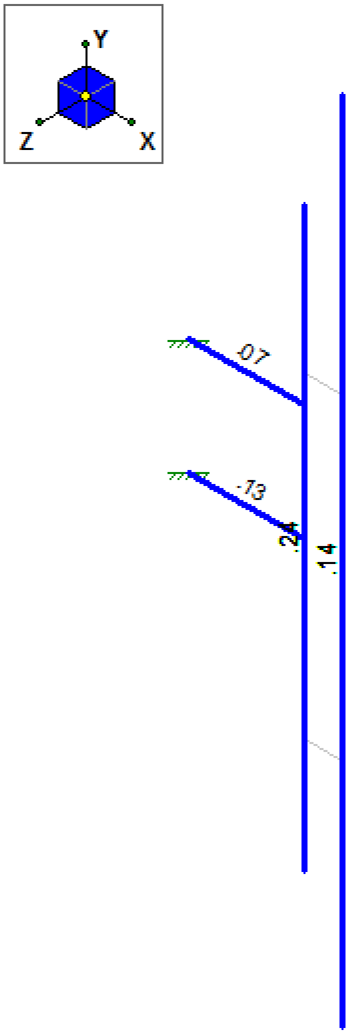


Envelope Only Solution

Worst Case Loading:



Code Member Check:



Member Code Checks Displayed
Envelope Only Solution

Antenna Mount Attachment:

X-Direction Tension (lbs): $T_x := 190\text{lbf}$ (ASD) From Risa 3-D

Y-Direction Shear (lbs): $V_y := 100 \cdot \text{lbf}$ (ASD) From Risa 3-D

Z-Direction Shear (lbs): $V_z := 327 \cdot \text{lbf}$ (ASD) From Risa 3-D

Combined Shear Force (lbs): $V := \sqrt{V_y^{\,2} + V_z^{\,2}}$ $V = 341.9\ \text{lbf}$

Shear Per Bolt (lbs): $V_d := \frac{V}{2}$ $V_d = 171\ \text{lbf}$

Tension Per Bolt (lbs): $N_d := \frac{T_x}{2}$ $N_d = 95\ \text{lbf}$

Assume 1/2"ϕ HILTI HY-20 Adhesive Anchors with 3-3/8" Effective Embedment:

Assume Hollow Brick Parapet

Allowable Shear Per Bolt (lbs): $V_{rec} := 1375\text{lbf}$

Allowable Tension Per Bolt (lbs): $N_{rec} := 775\text{lbf}$

Check Interaction:

$$\text{Check} := \begin{cases} \text{"OK, connection can be used"} & \text{if } \frac{N_d}{N_{rec}} + \frac{V_d}{V_{rec}} \le 1.0 \\ \text{"No Good"} & \text{otherwise} \end{cases}$$

Check = "OK, connection can be used"

$$\text{Interaction} := \frac{N_d}{N_{rec}} + \frac{V_d}{V_{rec}}$$ Interaction = 0.247

The existing anchor bolts have been determined to have **ADEQUATE** structural capacity to support the proposed **AT&T** equipment, together with the existing loading.