



Daniel F. Caruso
Chairman

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

Internet: ct.gov/csc

July 26, 2010

Steven L. Levine
Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-164-100706** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 482 Pigeon Hill Road, Windsor, Connecticut.

Dear Mr. Levine:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the conditions that:

- a) the tower be reinforced in accordance with the structural analysis prepared by Centek Engineering dated June 24, 2010 and stamped by Carlo Centore; and
- b) The tower shall not exceed 100 percent of its post-construction structural rating; and
- c) Not more than 45 days after completion of construction, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the modifications have been properly completed and the tower does not exceed 100 percent of its post-construction structural rating.

The proposed modifications are to be implemented as specified here and in your notice dated July 6, 2010, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any



CONNECTICUT SITING COUNCIL
Affirmative Action / Equal Opportunity Employer

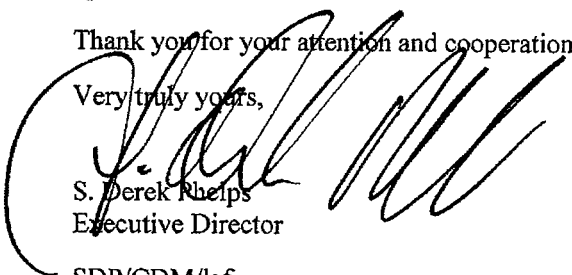
July 26, 2010

Page 2

deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,



S. Derek Rhelps
Executive Director

SDP/CDM/laf

c: The Honorable Donald Trinks, Mayor, Town of Windsor
Peter Souza, Town Manager, Windsor Town Hall
Eric Barz, Town Planner, Town of Windsor
Kenneth C. Baldwin, Esq., Robinson & Cole LLP

Martin, David C.

From: Steve Levine [Steve.Levine@SAI-Comm.com]
Sent: Tuesday, January 17, 2012 12:18 PM
To: Martin, David C.
Cc: Tim Burks; Mark Appleby
Subject: RE: Satisfaction of Approval Conditions in EM-CING-164-100706 (AT&T CT1144)

Dave,

A valid question.....

Both Verizon and AT&T pursued equipment upgrade projects during the spring and summer of 2010. Both separately and in combination, the two projects required tower and foundation improvements to meet structural requirements. Centek performed structural analyses for both companies, and Verizon and AT&T shared in the cost of structural upgrades.

The AT&T *Revision 1* structural analysis was included to demonstrate that AT&T had decreased loading between the exempt mod notice and the actual construction reflected in Revision 2.

At the end of the projects, Centek sent its letter to Verizon certifying that cumulative equipment mods and cumulative structural mods were in compliance with the 100% rule. The letter certifies that the structural mods satisfied both the Verizon and AT&T *Revision 2* requirements. Either we did not receive or could not locate a similar letter to AT&T. Fortunately, Verizon was able to assist us by providing their letter.

I hope this answers your questions. If there are more issues, please do not hesitate to call or email.

Thanks.

AT&T Mobility / New Cingular Wireless PCS, LLC / SAI Communications

Steve Levine 500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067

Real Estate Consultant Office 860-513-7636 Mobile 203-556-1655 Fax 860-513-7190

This e-mail, and any attachments, are intended only for use by the addressee(s) named herein and may contain legally privileged and/or confidential information. It is the property of Cingular Wireless. If you are not the intended recipient of this email, you are hereby notified that any dissemination, distribution or copying of this email, any attachments thereto, and any use of the information contained is strictly prohibited. If you have received this email in error, please notify me at (860-513-7636) and permanently delete the original and any copy thereof.

From: Martin, David C. [mailto:David.C.Martin@ct.gov]
Sent: Tuesday, January 17, 2012 11:46 AM
To: Steve Levine
Subject: RE: Satisfaction of Approval Conditions in EM-CING-164-100706

Steve,

Thanks. But I'm a little confused. You've sent two structural analyses for the AT&T UMTS upgrade, but the cover letter refers to a Verizon project. Can you illuminate my confusion?

From: Steve Levine [mailto:Steve.Levine@SAI-Comm.com]
Sent: Monday, January 16, 2012 11:17 AM
To: Martin, David C.
Cc: Tim Burks; Mark Appleby
Subject: Satisfaction of Approval Conditions in EM-CING-164-100706

Dave,

Please accept this email as satisfaction of approval conditions in EM-CING-164-100706:

1/17/2012

RE: **EM-CING-164-100706** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 482 Pigeon Hill Road, Windsor, Connecticut.

Dear Mr. Levine:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the conditions that:

- a) the tower be reinforced in accordance with the structural analysis prepared by Centek Engineering dated June 24, 2010 and stamped by Carlo Centore; and
- b) The tower shall not exceed 100 percent of its post-construction structural rating; and
- c) Not more than 45 days after completion of construction, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the modifications have been properly completed and the tower does not exceed 100 percent of its post-construction structural rating.

The attached Centek PE letter dated 7/11/11 certifies that the Pigeon Hill Road tower does not exceed 100% of its structural rating following:

- Verizon's approved equipment and tower modifications, and
- AT&T's approved equipment and tower modifications.

Note that the PE letter references Centek's Revision 2 of the AT&T structural analysis. Revision 2 incorporates a lighter AT&T equipment load than Revision 1, which was submitted with AT&T's exempt modification notice and referenced in the Council's approval letter. The lighter load was installed on the tower to mitigate structural conditions in place of the heavier load reflected in the EM notice and Revision 1.

Thank you.

**AT&T Mobility / New Cingular Wireless PCS, LLC / SAI
Communications**

Steve Levine

500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067

Real Estate Consultant

Office 860-513-7636

Mobile 203-556-1655

Fax 860-513-7190

This e-mail, and any attachments, are intended only for use by the addressee(s) named herein and may contain legally privileged and/or confidential information. It is the property of Cingular Wireless. If you are not the intended recipient of this email, you are hereby notified that any dissemination, distribution or copying of this email, any attachments thereto, and any use of the information contained is strictly prohibited. If you have received this email in error, please notify me at (860-513-7636) and permanently delete the original and any copy thereof.

Martin, David C.

From: Steve Levine [Steve.Levine@SAI-Comm.com]
Sent: Monday, January 16, 2012 11:17 AM
To: Martin, David C.
Cc: Tim Burks; Mark Appleby
Subject: Satisfaction of Approval Conditions in EM-CING-164-100706
Attachments: Verizon Windsor CSC Cert Letter.pdf; 1144 Structural Analysis Rev2.pdf; 1144 Structural Analysis Rev1.pdf

Dave,

Please accept this email as satisfaction of approval conditions in EM-CING-164-100706:

RE: EM-CING-164-100706 – New Cingular Wireless PCS, LLC notice of intent to modify telecommunications facility located at 482 Pigeon Hill Road, Windsor, Connecticut

Dear Mr. Levine:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut with the conditions that:

- a) the tower be reinforced in accordance with the structural analysis prepared by Centek Engineering dated June 24, 2010 and stamped by Carlo Centore; and
- b) The tower shall not exceed 100 percent of its post-construction structural rating;
- c) Not more than 45 days after completion of construction, a signed letter from a Engineer duly licensed in the State of Connecticut shall be submitted to the Council certifying that the modifications have been properly completed and the tower does not exceed post-construction structural rating.

The attached Centek PE letter dated 7/11/11 certifies that the Pigeon Hill Road tower does not exceed 100% of its structural rating following:

- Verizon's approved equipment and tower modifications, and
- AT&T's approved equipment and tower modifications.

Note that the PE letter references Centek's Revision 2 of the AT&T structural analysis. Revision 2 incorporates a lighter AT&T equipment load than Revision 1, which was submitted with AT&T's exempt modification notice and referenced in the Council's approval letter. The lighter load was installed on the tower to mitigate structural conditions in place of the heavier load reflected in the EM notice and Revision 1.

Thank you.

AT&T Mobility / New Cingular Wireless PCS, LLC / SAI Communications

1/17/2012

Steve Levine

500 Enterprise Drive, 3rd Fl., Rocky Hill, CT 06067

Real Estate Consultant

Office 860-513-7636

Mobile 203-556-1655

Fax 860-513-7190

This e-mail, and any attachments, are intended only for use by the addressee(s) named herein and may contain legally privileged and/or confidential information. It is the property of Cingular Wireless. If you are not the intended recipient of this email, you are hereby notified that any dissemination, distribution or copying of this email, any attachments thereto, and any use of the information contained is strictly prohibited. If you have received this email in error, please notify me at (860-513-7636) and permanently delete the original and any copy thereof.

July 11, 2011

Mr. Mark Gauger
Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

Re: Existing Telecommunications Tower Modification Certification Letter

Project: Verizon ~ Windsor
482 Pigeon Hill Road
Windsor, Connecticut

Engineer: Centek Engineering
63-2 North Branford Road Branford, CT 06405

Contractor: Construction Services of Branford
63-2 North Branford Road, Branford CT 06405

Centek Project No.: 10179.CO22

Dear Mr. Gauger,

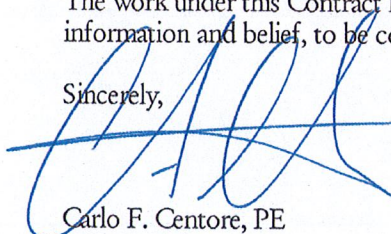
We are providing this "Existing Telecommunications Tower Modification Certification Letter" with regard to the antenna upgrade by Verizon Wireless at the above referenced project.

The following are the basis for substantiating compliance with the design documents prepared by Centek Engineering:

- ☐ Review of the structural analysis prepared for Verizon Wireless by Centek Engineering entitled "Proposed Verizon Wireless LTE Antenna Installation," Rev-1 dated 2/3/2010 and the updated Centek Engineering analysis Rev-2 dated 7/9/2010.
- ☐ Review of the structural analysis prepared for AT&T by Centek Engineering entitled "Proposed AT&T UMTS Antenna Upgrade," Rev-2 dated 8/20/2010.
- ☐ Review of the rock anchor reinforcement drawing prepared by Centek Engineering, entitled SSK-1, dated 1/4/2011.
- ☐ Field observations by Centek personnel of antenna installation on 7/7/2011 confirming compliance with the above referenced documents.
- ☐ The tower and foundation do not exceed 100 percent of their post-construction structural rating with the implemented reinforcements.

The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the documents referenced above.

Sincerely,


Carlo F. Centore, PE
Principal ~ Structural Engineer
CC: Rachel Mayo, Tim Parks,





Centered on Solutions™

Structural Analysis Report

160' Existing ROHN Lattice Tower

Proposed AT&T UMTS Antenna Upgrade

AT&T Site Ref: CT1144

*482 Pigeon Hill Road
Windsor, CT*

CENTEK Project No. 10079-CO1

~~Date: May 24, 2010~~

~~Revision 1: June 24, 2010~~

Revision 2: August 20, 2010



Prepared for:

**AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067**

Table of Contents

SECTION 1 - REPORT

- INTRODUCTION.
- ANTENNA AND APPURTENANCE SUMMARY.
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS.
- ANALYSIS.
- TOWER LOADING.
- TOWER CAPACITY.
- FOUNDATION AND ANCHORS.
- CONCLUSION AND RECOMMENDATIONS.

SECTION 2 – CONDITIONS & SOFTWARE

- STANDARD ENGINEERING CONDITIONS.
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM.

SECTION 3 – CALCULATIONS

- RISATower INPUT/OUTPUT SUMMARY.
- RISATower FEED LINE PLAN.
- RISATower FEED LINE DISTRIBUTION.
- RISATower DETAILED OUTPUT.
- PAD AND PIER FOUNDATION ANALYSIS.
- EL-1 – TOWER ELEVATION AND PLANS.
- S-1 – MAST CONNECTION DETAILS.
- S-2 – MAST CONNECTION DETAILS.
- S-3 – TOWER REINFORCEMENT DETAILS.
- N-1 THRU N-3 – STRUCTURAL NOTES

CENTEK Engineering, Inc.
Structural Analysis – 160' Rohn Lattice Tower
AT&T UMTS Antenna Upgrade – CT1144
Windsor, CT
Revision 2 ~ August 20, 2010

Table of Contents – cont.

SECTION 4 – ANTENNA MAST ANALYSIS AND DESIGN

- EIA/TIA LOAD CALCULATIONS.
- RISA 3D ANALYSIS
- MATHCAD MAST CONNECTION TO HSS
- MATHCAD MAST CONNECTION TO TOWER

SECTION 5 – REFERENCE MATERIALS

- S-1 THRU S-3 TOWER REINFORCEMENT DRAWINGS PREPARED BY NATCOMM INC., FOR VERIZON WIRELESS DATED 02/03/10.
- AT&T RF DATA SHEET
- AT&T ANTENNA/APPURTENANCE CUT SHEETS

Introduction

The purpose of this report is to summarize the results of the non-linear, P- Δ structural analysis of the antenna installation/modification proposed by AT&T on the existing self supporting lattice tower located in Windsor, Connecticut.

The host tower is a 160-ft, three legged, tapered lattice tower originally designed and manufactured by UNR-ROHN. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes, tower reinforcements and foundation reinforcements were taken from a structural analysis report prepared by Natcomm, Inc; project no. 10001.CO8, Rev. 1 dated February 3, 2010. Antenna and appurtenance inventory were taken from the aforementioned Natcomm, Inc. structural analysis report and a AT&T RF data sheet.

The tower is made of eight (8) tapered vertical sections consisting of structural steel pipe legs. Diagonal lateral support bracing consists of structural steel angle shapes. The vertical tower sections are connected by bolted flange plates while the pipe legs and bracing are connected by welded and bolted gusset connections. The width of the tower face is 8.56-ft at the top and 22.85-ft at the base.

AT&T proposes the removal of one (1) existing antenna pipe mast, the replacement of three (3) panel antennas and six (6) TMAs with six (6) panel antennas, six (6) TMAs and the installation of three (3) 10-ft 6in T-Arms all mounted to one (1) antenna pipe mast. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing tower was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (EXISTING):
Antenna: One (1) 15-ft x 2-in $\varnothing$ Omni-directional (whip) antenna mounted with an elevation of ± 167.5 -ft above the tower base.
Coax Cable: One (1) 7/8" $\varnothing$ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing):
Antennas: Six (6) Antel LPA-80063-4CF, six (6) Decibel DB948F85T2E-M, two (2) Antel BXA-70040/6CF and one (1) Antel BXA-70063/6CF panel antennas mounted on three (3) Valmont 15-ft T-Frames (P/N 860109) with a RAD center elevation of ± 156.5 -ft above the existing tower base.
Coax Cables: Eighteen (18) 1-5/8" $\varnothing$ coax cables running on the face of the existing tower configured in 2 rows of 9 cables as specified in Section 3 of this report.
- T-MOBILE (Existing):
Antennas: Six (6) RFS APXV18-209014, three (3) RFS APX16DWV-16DWVS-C-A20 panel antennas and nine (9) TMA's mounted on three (3) 15-ft Wireless Frames with a RAD center elevation of ± 147 -ft above the existing tower base.
Coax Cables: Eighteen (18) 1-5/8" $\varnothing$ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
Antenna: One (1) 15-ft x 2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±127.5-ft above the tower base.
Coax Cable: One (1) 7/8" Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 8-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±111.33-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 6-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±102-ft above the tower base.
Coax Cable: One (1) EW90 Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 16-ft x 2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±108-ft above the tower base.
Coax Cable: One (1) 7/8" Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 6-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±94-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 10-ft Ø dish antenna on a 6-ft 8-in x 4-in Ø pipe mount with an elevation of ±72-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (EXISTING):
Antenna: One (1) empty 4-ft side mount standoff with an elevation of ±47-ft above the tower base.
Coax Cables: Not applicable.
- UNKNOWN (Existing):
Antenna: One (1) 12-ft x 1-1/2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±45.41-ft above the tower base.
Coax Cable: One (1) 1/2-in Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- **AT&T (Existing to Remove):**
Antennas: Three (3) MB96RR900200DPBL panel antennas and six (6) TMA's mounted on a 10-ft x 4-in Ø pipe with a RAD center elevation of ±167.75-ft above the existing tower base.
Pipe Mast: One (1) 10-ft x 4-in Ø pipe mast and related mounting hardware.
- **AT&T (Existing to Remain)**
Coax Cables: Nine (9) 1-1/4" Ø coax cables running on a leg/face of the existing tower as specified on drawing SK-1 within Section 3 of this report.
- **AT&T (Proposed):**
Antennas: Six (6) KMW AM-X-CD-14-65-00T-RET panel antennas and six (6) Powerwave TT19-08DB111 TMA's, mounted on three (3) 10-ft-6in T-Arms, Valmont P/N 802738 all connected to a 8" SCH.40 x 18-ft long PCS mast with a RAD center elevation of ±169-ft above the existing tower base.
Coax Cables: Three (3) 1-1/4" Ø coax cables running on a leg/face of the existing tower as specified on drawing EL-1 within Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- **All coax cables shall be routed as specified on drawing EL-1 within Section 3 of this report.**
- **Tower and foundation reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 were implemented (See section 5 of this report).**

Analysis

The existing tower was analyzed using a comprehensive computer program entitled RISATower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower legs, and the model assumes that the leg members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 80 mph basic wind speed (fastest mile) with no ice and 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	[Section 16 of TIA/EIA-222-F-96]
	Windsor; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	[Appendix K of the 2005 CT Building Code Supplement]
	<i>TIA/EIA wind speed Controls</i>	
Load Cases:	<u>Load Case 1</u> ; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design of monopole towers.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 2</u> ; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed. This load case typically controls the design of lattice towers.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 3</u> ; Seismic – not checked	[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type

Results

LATTICE TOWER

Tower stresses were calculated utilizing the structural analysis software RISATower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- With the reinforcements outlined within section 3 of this report the calculated stresses were found to be within allowable limits. In Load Case 1, per RISATower "Section Capacity Table", this tower was found to be at **95.8%** of its total capacity.

	Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
With Proposed Reinforcements	Leg (T2)	120'-0"-140'-0"	95.2%	PASS
	Diagonal (T5)	60'-0"-80'-0"	95.8%	PASS

Note 1: Results based on implementation of previously proposed structural steel reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless.

PCS MAST

- The existing AT&T antenna pipe mast was determined to be structurally inadequate. Replacement of the existing antenna mast with a 8 SCH. 40 Pipe x 18 -ft long (O.D. = 8.625"), conforming to ASTM A53, Grade B, Fy = 35 ksi specifications will be required.

Foundation and Anchors

The existing foundation consists of three (3) 3-ft $\varnothing$ reinforced concrete piers on three (3) 8-ft square reinforced concrete pads subsequently reinforced with an internal 8' thick concrete mat bearing directly on existing sub grade. The existing foundation locations and dimensions were taken from the aforementioned Natcomm structural analysis report. Allowable soil bearing pressure was assumed to be 4,500 psi for the analysis. Tower legs are connected to the three (3) piers by means of (6) 7/8" $\varnothing$, ASTM A354 Grade BC anchor bolts per leg, embedded into the concrete foundation structure.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower reactions developed from the governing Load Case 1 of the proposed reinforced tower condition were used in the verification of the foundation and anchor bolts:

Leg Reactions	Vector	Proposed Load (kips)
Leg	Shear	22
	Compression	190
	Uplift	162
Base	Shear	37
	Compression	29
	Moment	3502

CEN TEK

Structural Analysis – 160' Rohn Lattice Tower
AT&T UMTS Antenna Upgrade – CT1144
Windsor, CT
Revision 2 ~ August 20, 2010

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	79.2%	PASS

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS) ⁽¹⁾	Proposed Loading (FS) ⁽¹⁾	Result
(3) Reinf. Conc. Pad and Pier w/ Reinf. Conc. Mat	OM ⁽²⁾	2.00	2.38	PASS

Note 1: FS denotes Factor of Safety

Note 2: OM denotes Overturning Moment

Note 3: Results based on implementation of foundation reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless.

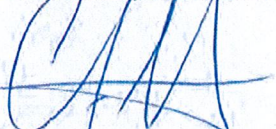
Conclusion

This analysis indicates that the subject tower is adequate to support the proposed antenna installation with the implementation of previous reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless and additional proposed reinforcements as detailed within section 3 of this report.

The analysis is based, in part, on the information provided to this office by AT&T. 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.

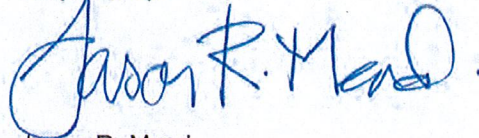
Respectfully Submitted by:



Carlo F. Centore, PE
Principal ~ Structural Engineer



Prepared by:



Jason R. Mead
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 provide 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.

CEN TEK Engineering, Inc.

Structural Analysis – 160' Rohn Lattice Tower

AT&T UMTS Antenna Upgrade – CT1144

Windsor, CT

Revision 2 ~ August 20, 2010

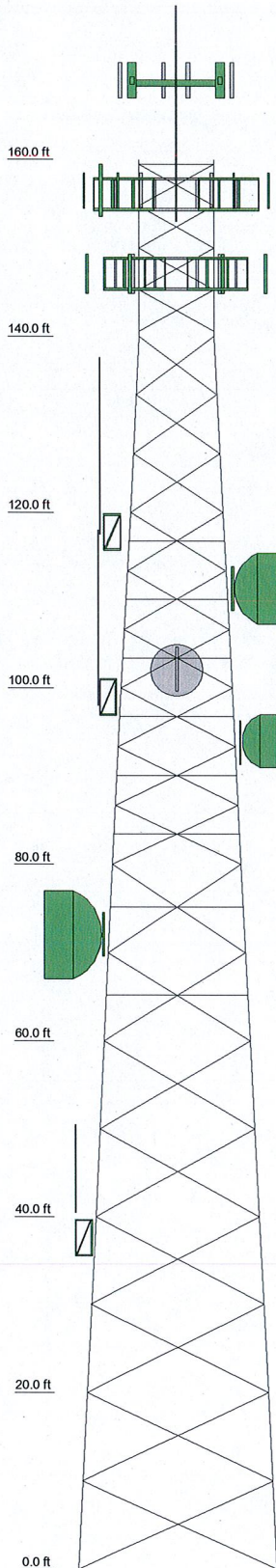
General Description of Structural Analysis Program

RISATower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, RISATower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

RISATower Features:

- RISATower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- RISATower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	T1	T2	T3	T4	T5	T6	T7	T8
Legs	ROHN 2.5 STD		ROHN 2.5 EH	ROHN 3 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	
Leg Grade								
Diagonals	L1 3/4x1 3/4x3/16	L2x2x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16	L3x3x1/4	L3 1/2x3 1/2x1/4	L4x4x1/4	
Diagonal Grade								
Top Girts	L2 1/2x2 1/2x3/8							
Sec. Horizontals	N.A.		L2 1/2x2 1/2x3/16	L3x3x3/16	L3x3x1/4			
Face Width (ft)			10.56	12.6	14.66	16.66	20.85	
# Panels @ (ft)	4 @ 4.75		9 @ 6.66667			8 @ 10		
Weight (K)	1.0	0.9	1.5	2.1	2.5	2.7	3.3	16.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) AM-X-CD-14-65-00TT-RET (ATI - Proposed)	169	Valmont 15' T-Frame P/N 860109 (Verizon)	156
(2) AM-X-CD-14-65-00TT-RET (ATI - Proposed)	169	15' Frame (T-Mobile)	147
(2) AM-X-CD-14-65-00TT-RET (ATI - Proposed)	169	15' Frame (T-Mobile)	147
(2) TT19-08BP111-001 TMA (ATI - Proposed)	169	(2) APXV18-209014 (T-Mobile)	147
(2) TT19-08BP111-001 TMA (ATI - Proposed)	169	(2) APXV18-209014 (T-Mobile)	147
(2) TT19-08BP111-001 TMA (ATI - Proposed)	169	(2) APXV18-209014 (T-Mobile)	147
Valmont Uni-Tri Bracket (ATI - Proposed)	169	APX16DWW-16DWW-S-C-A20 (T-Mobile)	147
Valmont 10'-6" T-Arm 3 (Colo Kit P/N 802738) (ATI - Proposed)	169	APX16DWW-16DWW-S-C-A20 (T-Mobile)	147
15' x 2" Dia Omni (Unknown)	167.5	APX16DWW-16DWW-S-C-A20 (T-Mobile)	147
P8 x18-ft Pipe Mast (ATI - proposed)	167.5	TMA (T-Mobile)	147
DB948F85T2E-M (Verizon)	156.5	TMA (T-Mobile)	147
DB948F85T2E-M (Verizon)	156.5	TMA (T-Mobile)	147
LPA-80063-4CF (Verizon)	156.5	15' Frame (T-Mobile)	147
LPA-80063-4CF (Verizon)	156.5	15' x 2" Dia Omni (Unknown)	127.5
DB948F85T2E-M (Verizon)	156.5	4' Side Mount Standoff (Unknown)	117.75
DB948F85T2E-M (Verizon)	156.5	50"x4.5" Pipe Mount (Unknown)	111.33
LPA-80063-4CF (Verizon)	156.5	8 FT DISH (Unknown)	111.33
LPA-80063-4CF (Verizon)	156.5	16' x 2" Dia Omni (Unknown)	108
DB948F85T2E-M (Verizon)	156.5	50"x4.5" Pipe Mount (Unknown)	102.2
DB948F85T2E-M (Verizon)	156.5	6 FT DISH (Unknown)	102
LPA-80063-4CF (Verizon)	156.5	4' Side Mount Standoff (Unknown)	99
BXA-70040/6CF (Verizon)	156.5	6 FT DISH (Unknown)	94
BXA-70040/6CF (Verizon)	156.5	50"x4.5" Pipe Mount (Unknown)	93.83
BXA-70063/6CF (Verizon)	156.5	50"x4.5" Pipe Mount (Unknown)	72.1
LPA-80063-4CF (Verizon)	156.5	10 FT DISH (Unknown)	72
Valmont 15' T-Frame P/N 860109 (Verizon)	156	4' Side Mount Standoff (Vacant) (Unknown)	47
Valmont 15' T-Frame P/N 860109 (Verizon)	156	12' x 1-1/2" Dia Omni (Unknown)	45.41
		4' Side Mount Standoff (Unknown)	37.58

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

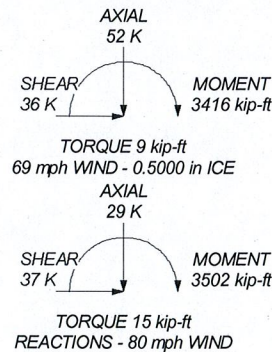
1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. TOWER RATING: 95.8%

MAX. CORNER REACTIONS AT BASE:

DOWN: 190 K

UPLIFT: -162 K

SHEAR: 22 K



CEN TEK Engineering, Inc.

63-2 N Branford Rd
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **160' ROHN SSV Self-Support Lattice ~ Rev 2**

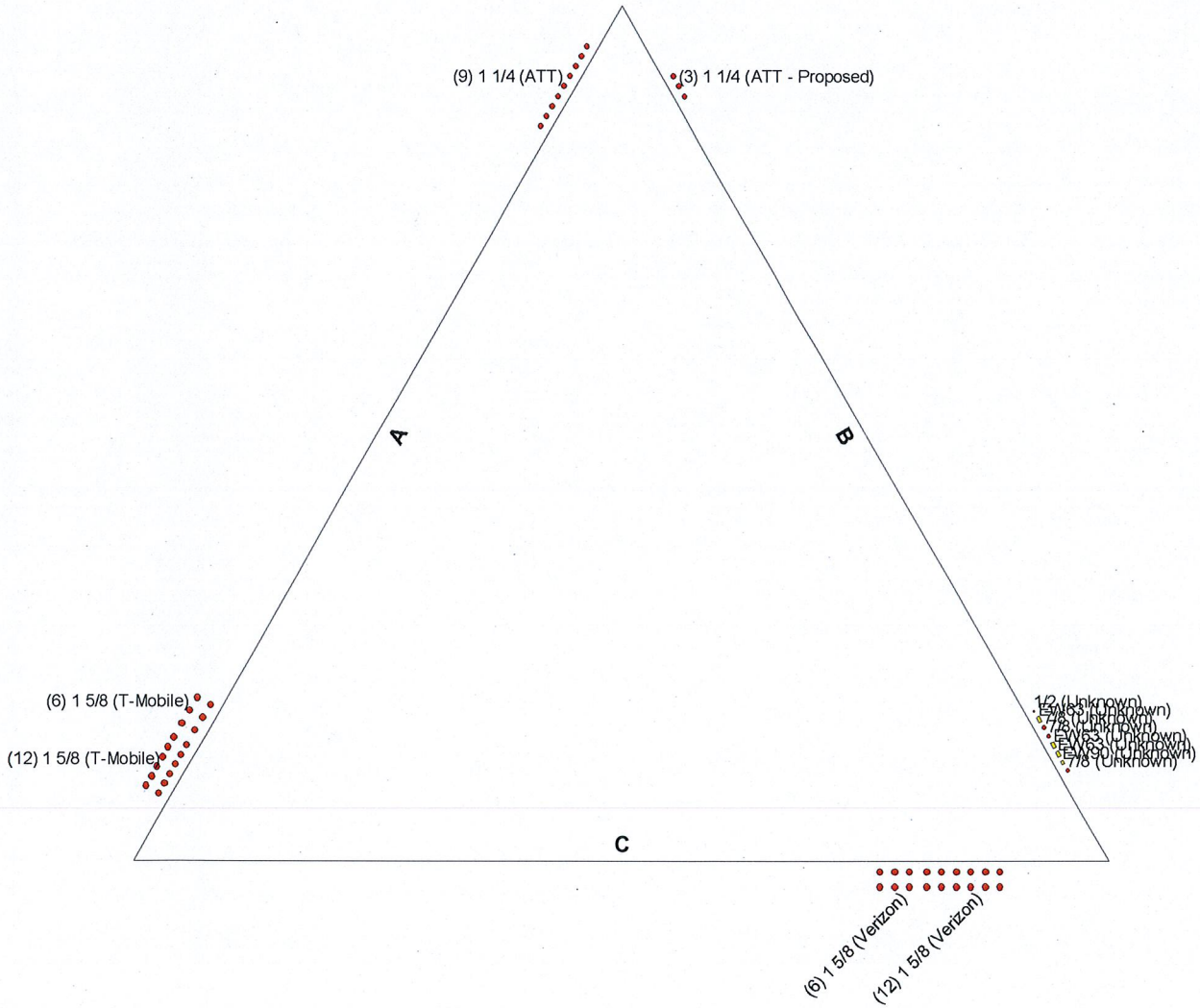
Project: **10079.CO1 - 482 Pigeon Hill Road, Windsor, CT**

Client: **AT&T** Drawn by: **Staff**

Code: **TIA/EIA-222-F** Date: **08/20/10**

Path: Scale: **NTS** Dwg No. **E-1**

Feedline Plan



CEN TEK Engineering, Inc.

63-2 N Branford Rd
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **160' ROHN SSV Self-Support Lattice ~ Rev 2**

Project: 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT

Client: AT&T	Drawn by: Staff
--------------	-----------------

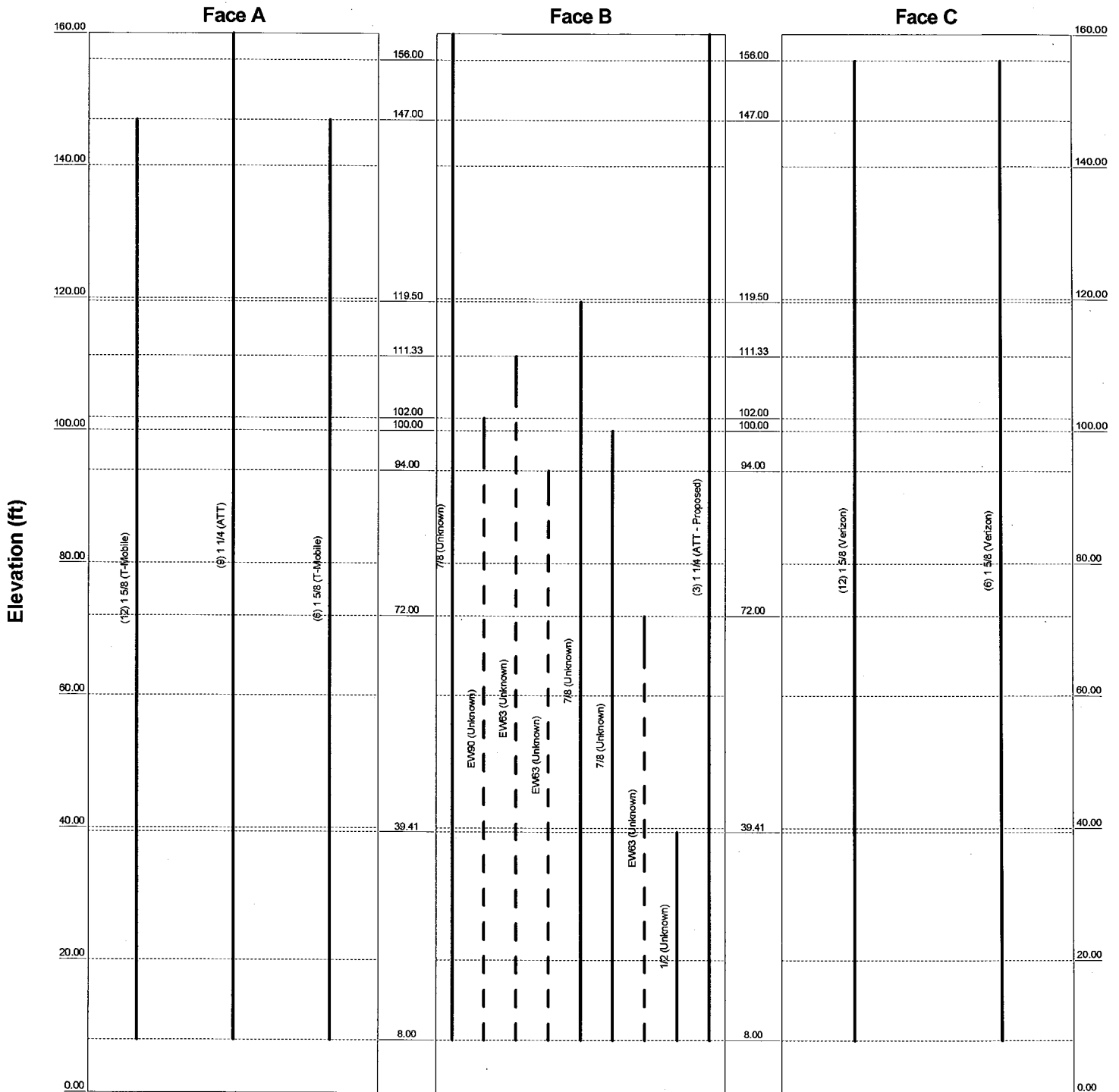
Code: TIA/EIA-222-F	Date: 08/20/10
---------------------	----------------

Path:	Dwg No. E-7
-------	-------------

Downloaded from <http://ajphaphapublications.sagepub.com/> at 402 Resonance Road, Boston, MA 02114 on June 10, 2015

Feedline Distribution Chart 0' - 160'

Round Flat App In Face App Out Face Truss Leg



CEN TEK Engineering, Inc.

63-2 N Branford Rd
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **160' ROHN SSV Self-Support Lattice ~ Rev 2**

Project: **10079.CO1 - 482 Pigeon Hill Road, Windsor, CT**

Client: **AT&T** Drawn by: **Staff** App'd:

Code: **TIA/EIA-222-F** Date: **08/20/10** Scale: **NTS**

Path: Dwg No. **E-7**

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 160' ROHN SSV Self-Support Lattice ~ Rev 2	Page 1 of 34
	Project 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client AT&T	Designed by Staff

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 160.00 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 8.56 ft at the top and 22.85 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

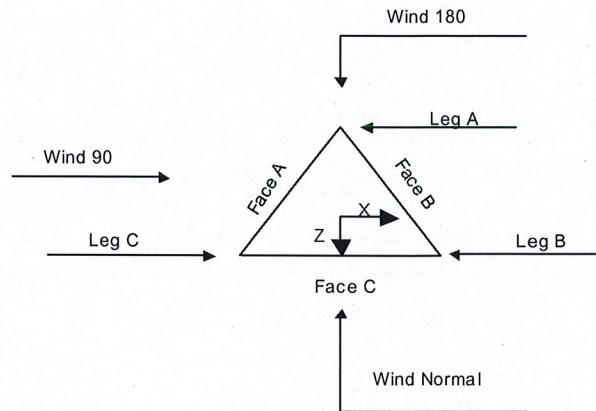
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 160' ROHN SSV Self-Support Lattice ~ Rev 2	Page 2 of 34
	Project 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client AT&T	Designed by Staff



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	160.00-140.00			8.56	1	20.00
T2	140.00-120.00			8.56	1	20.00
T3	120.00-100.00			10.56	1	20.00
T4	100.00-80.00			12.60	1	20.00
T5	80.00-60.00			14.66	1	20.00
T6	60.00-40.00			16.69	1	20.00
T7	40.00-20.00			18.69	1	20.00
T8	20.00-0.00			20.85	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	160.00-140.00	4.75	X Brace	No	No	6.0000	6.0000
T2	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T3	120.00-100.00	6.67	X Brace	No	Yes	0.0000	0.0000
T4	100.00-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T5	80.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T6	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T7	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	3 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T8	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 160.00-140.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 140.00-120.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-80.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T5 80.00-60.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T6 60.00-40.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T7 40.00-20.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T8 20.00-0.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 160.00-140.00	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
ft						
T3 120.00-100.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T4 100.00-80.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T5 80.00-60.00	Equal Angle	L3x3x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	4 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in						
T1 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹								
			Legs	X	K	Single	Girts	Horiz.	Sec.	Inner	
				Brace	Brace	Diags					
				Diags	Diags						
ft			X	X	X	X	X	X	X	X	
			Y	Y	Y	Y	Y	Y	Y	Y	
T1 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	
T2 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	
T3 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	
T4 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	
T5 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	
T6 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	
T7 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	
T8 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	
				1	1	1	1	1	1	1	

¹Note: 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)

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 160' ROHN SSV Self-Support Lattice ~ Rev 2	Page 5 of 34
	Project 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client AT&T	Designed by Staff

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 160.00-140.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 140.00-120.00	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	0
T3 120.00-100.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325X	2
T4 100.00-80.00	Flange	0.8750 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2
T5 80.00-60.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	2
T6 60.00-40.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T7 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T8 20.00-0.00	Flange	0.8750 A354-BC	6	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0

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
1 5/8 (Verizon)	C	Yes	Ar (CfAe)	156.00 - 8.00	2.0000	-0.35	12	6	1.9800	1.9800		1.04
1 5/8 (T-Mobile)	A	Yes	Ar (CfAe)	147.00 - 8.00	2.0000	-0.4	12	6	1.0000 1.9800	1.9800		1.04
1 1/4 (ATT)	A	Yes	Ar (CfAe)	160.00 - 8.00	2.0000	0.4	9	9	1.5500	1.5500		0.66

RISATower CENTEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	6 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

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 (Unknown)	B	Yes	Ar (CfAe)	160.00 - 8.00	2.0000	0.4	1	1	1.1100	1.1100		0.54
EW90 (Unknown)	B	Yes	Af (CfAe)	102.00 - 8.00	2.0000	0.39	1	1	0.9869	0.9869	3.2550	0.32
EW63 (Unknown)	B	Yes	Af (CfAe)	111.33 - 8.00	2.0000	0.38	1	1	1.5742	1.5742	5.0668	0.51
EW63 (Unknown)	B	Yes	Af (CfAe)	94.00 - 8.00	2.0000	0.37	1	1	1.5742	1.5742	5.0668	0.51
7/8 (Unknown)	B	Yes	Ar (CfAe)	119.50 - 8.00	2.0000	0.36	1	1	1.1100	1.1100		0.54
7/8 (Unknown)	B	Yes	Ar (CfAe)	100.00 - 8.00	2.0000	0.35	1	1	1.1100	1.1100		0.54
EW63 (Unknown)	B	Yes	Af (CfAe)	72.00 - 8.00	2.0000	0.34	1	1	1.5742	1.5742	5.0668	0.51
1/2 (Unknown)	B	Yes	Ar (CfAe)	39.41 - 8.00	2.0000	0.33	1	1	0.5800	0.5800		0.25
1 5/8 (T-Mobile)	A	Yes	Ar (CfAe)	147.00 - 8.00	2.0000	-0.34	6	3	1.9800	1.9800		1.04
1 5/8 (Verizon)	C	Yes	Ar (CfAe)	156.00 - 8.00	2.0000	-0.28	6	3	1.9800	1.9800		1.04
1 1/4 (ATT - Proposed)	B	Yes	Ar (CfAe)	160.00 - 8.00	2.0000	-0.4	3	3	1.5500	1.5500		0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T1	160.00-140.00	A	33.645	0.000	0.000	0.000	0.25
		B	9.600	0.000	0.000	0.000	0.05
		C	23.760	0.000	0.000	0.000	0.30
T2	140.00-120.00	A	52.950	0.000	0.000	0.000	0.49
		B	9.600	0.000	0.000	0.000	0.05
		C	29.700	0.000	0.000	0.000	0.37
T3	120.00-100.00	A	52.950	0.000	0.000	0.000	0.49
		B	11.404	1.651	0.000	0.000	0.07
		C	29.700	0.000	0.000	0.000	0.37
T4	100.00-80.00	A	52.950	0.000	0.000	0.000	0.49
		B	13.300	6.105	0.000	0.000	0.10
		C	29.700	0.000	0.000	0.000	0.37
T5	80.00-60.00	A	52.950	0.000	0.000	0.000	0.49
		B	13.300	8.466	0.000	0.000	0.10
		C	29.700	0.000	0.000	0.000	0.37
T6	60.00-40.00	A	52.950	0.000	0.000	0.000	0.49
		B	13.300	9.516	0.000	0.000	0.11
		C	29.700	0.000	0.000	0.000	0.37
T7	40.00-20.00	A	52.950	0.000	0.000	0.000	0.49
		B	14.238	9.516	0.000	0.000	0.11
		C	29.700	0.000	0.000	0.000	0.37
T8	20.00-0.00	A	31.770	0.000	0.000	0.000	0.30
		B	8.560	5.710	0.000	0.000	0.07
		C	17.820	0.000	0.000	0.000	0.22

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	7 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

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} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T1	160.00-140.00	A	0.500	45.203	8.692	0.000	0.000	0.72
		B		16.267	0.000	0.000	0.000	0.15
		C		35.760	0.000	0.000	0.000	0.74
T2	140.00-120.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		16.267	0.000	0.000	0.000	0.15
		C		44.700	0.000	0.000	0.000	0.92
T3	120.00-100.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		19.695	2.391	0.000	0.000	0.20
		C		44.700	0.000	0.000	0.000	0.92
T4	100.00-80.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		23.300	9.105	0.000	0.000	0.30
		C		44.700	0.000	0.000	0.000	0.92
T5	80.00-60.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		23.300	12.466	0.000	0.000	0.33
		C		44.700	0.000	0.000	0.000	0.92
T6	60.00-40.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		23.300	13.960	0.000	0.000	0.34
		C		44.700	0.000	0.000	0.000	0.92
T7	40.00-20.00	A	0.500	58.117	24.833	0.000	0.000	1.41
		B		25.856	13.960	0.000	0.000	0.36
		C		44.700	0.000	0.000	0.000	0.92
T8	20.00-0.00	A	0.500	34.870	14.900	0.000	0.000	0.85
		B		15.560	8.376	0.000	0.000	0.22
		C		26.820	0.000	0.000	0.000	0.55

Feed Line Shielding

Section	Elevation ft	Face	A _R ft ²	A _R Ice ft ²	A _F ft ²	A _F Ice ft ²
T1	160.00-140.00	A	0.000	2.279	2.595	4.157
		B	0.000	0.688	0.740	1.255
		C	0.000	1.512	1.833	2.758
T2	140.00-120.00	A	0.000	2.532	3.232	5.063
		B	0.000	0.496	0.586	0.993
		C	0.000	1.364	1.813	2.728
T3	120.00-100.00	A	0.000	3.432	5.476	8.579
		B	0.000	0.929	1.350	2.323
		C	0.000	1.849	3.072	4.623
T4	100.00-80.00	A	0.000	3.346	6.408	10.039
		B	0.000	1.368	2.349	4.103
		C	0.000	1.803	3.595	5.410
T5	80.00-60.00	A	0.000	2.332	4.465	6.995
		B	0.000	1.062	1.836	3.185
		C	0.000	1.257	2.505	3.770
T6	60.00-40.00	A	0.000	1.588	3.549	5.560
		B	0.000	0.756	1.529	2.646
		C	0.000	0.856	1.991	2.996
T7	40.00-20.00	A	0.000	1.550	3.462	5.424
		B	0.000	0.785	1.553	2.749
		C	0.000	0.835	1.942	2.923
T8	20.00-0.00	A	0.000	0.912	2.330	3.649
		B	0.000	0.463	1.046	1.853

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	8 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section	Elevation	Face	A_R	$A_{R_{Ice}}$	A_F	$A_{F_{Ice}}$
	ft		ft ²	ft ²	ft ²	ft ²
		C	0.000	0.492	1.307	1.967

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	$CP_{X_{Ice}}$	$CP_{Z_{Ice}}$
	ft	in	in	in	in
T1	160.00-140.00	1.8263	-4.1149	2.3128	-5.1146
T2	140.00-120.00	-3.3945	-0.3824	-2.0004	-1.8082
T3	120.00-100.00	-1.9386	0.0114	-0.4914	-1.3407
T4	100.00-80.00	0.0786	0.6863	1.6374	-0.6125
T5	80.00-60.00	0.9967	1.1078	2.8392	-0.4523
T6	60.00-40.00	1.5759	1.3651	3.7018	-0.3755
T7	40.00-20.00	2.1526	1.5966	4.8062	-0.1716
T8	20.00-0.00	1.4984	1.0850	3.4956	-0.1274

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	$C_A A_A$ Front	$C_A A_A$ Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
(2) AM-X-CD-14-65-00TT-RET (AT&T - Proposed)	A	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	5.51 5.90	2.83 3.14 0.04 0.07
(2) AM-X-CD-14-65-00TT-RET (AT&T - Proposed)	B	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	5.51 5.90	2.83 3.14 0.04 0.07
(2) AM-X-CD-14-65-00TT-RET (AT&T - Proposed)	C	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	5.51 5.90	2.83 3.14 0.04 0.07
(2) TT19-08BP111-001 TMA (AT&T - Proposed)	A	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62 0.02 0.02
(2) TT19-08BP111-001 TMA (AT&T - Proposed)	B	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62 0.02 0.02
(2) TT19-08BP111-001 TMA (AT&T - Proposed)	C	From Face	2.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62 0.02 0.02
Valmont Uni-Tri Bracket (AT&T - Proposed)	C	From Centroid-Face	0.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	0.00 0.00	0.00 0.00 0.29 0.31
P8 x18-ft Pipe Mast (AT&T - proposed)	C	From Centroid-Face	0.00 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	15.53 16.61	15.53 16.61 0.51 0.62
Valmont 10'-6" T-Armx 3 (Colo Kit P/N 802738) (AT&T - Proposed)	C	From Centroid-Face	0.00 0.00 0.00	0.0000	169.00	No Ice 1/2" Ice	15.97 20.77	15.97 20.77 0.47 0.59

<i>RISA</i>Tower CENTEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	9 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
LPA-80063-4CF (Verizon)	A	From Leg	5.00 -6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
DB948F85T2E-M (Verizon)	A	From Leg	5.00 -4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
DB948F85T2E-M (Verizon)	A	From Leg	5.00 4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
LPA-80063-4CF (Verizon)	A	From Leg	5.00 6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
LPA-80063-4CF (Verizon)	B	From Leg	5.00 -6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
DB948F85T2E-M (Verizon)	B	From Leg	5.00 -4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
DB948F85T2E-M (Verizon)	B	From Leg	5.00 4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
LPA-80063-4CF (Verizon)	B	From Leg	5.00 6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
LPA-80063-4CF (Verizon)	C	From Leg	5.00 -6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
DB948F85T2E-M (Verizon)	C	From Leg	5.00 -4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
DB948F85T2E-M (Verizon)	C	From Leg	5.00 4.00 0.00	0.0000	156.50	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	0.01 0.03
LPA-80063-4CF (Verizon)	C	From Leg	5.00 6.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.00 7.41	6.08 6.48	0.02 0.07
BXA-70040/6CF (Verizon)	A	From Leg	5.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice	16.31 16.93	5.72 6.17	0.04 0.12
BXA-70040/6CF (Verizon)	B	From Leg	5.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice	16.31 16.93	5.72 6.17	0.04 0.12
BXA-70063/6CF (Verizon)	C	From Leg	5.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice	7.73 8.27	3.76 4.19	0.02 0.06
Valmont 15' T-Frame P/N 860109 (Verizon)	A	From Leg	2.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice	13.90 20.00	13.90 20.00	0.39 0.53
Valmont 15' T-Frame P/N 860109 (Verizon)	B	From Leg	2.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice	13.90 20.00	13.90 20.00	0.39 0.53
Valmont 15' T-Frame P/N 860109 (Verizon)	C	From Leg	2.00 0.00 0.00	0.0000	156.00	No Ice 1/2" Ice	13.90 20.00	13.90 20.00	0.39 0.53
15' Frame (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	9.55 13.15	3.80 5.40	0.35 0.49

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	10 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>	
15' Frame (T-Mobile)	B	From Leg	0.50 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	9.55 13.15	3.80 5.40	0.35 0.49
15' Frame (T-Mobile)	C	From Leg	0.50 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	9.55 13.15	3.80 5.40	0.35 0.49
(2) APXV18-209014 (T-Mobile)	A	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	3.57 3.91	2.00 2.33	0.01 0.03
(2) APXV18-209014 (T-Mobile)	B	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	3.57 3.91	2.00 2.33	0.01 0.03
(2) APXV18-209014 (T-Mobile)	C	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	3.57 3.91	2.00 2.33	0.01 0.03
APX16DWV-16DWVS-C-A20 (T-Mobile)	A	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	7.07 7.52	2.15 2.49	0.04 0.07
APX16DWV-16DWVS-C-A20 (T-Mobile)	B	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	7.07 7.52	2.15 2.49	0.04 0.07
APX16DWV-16DWVS-C-A20 (T-Mobile)	C	From Leg	4.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	7.07 7.52	2.15 2.49	0.04 0.07
TMA (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
TMA (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
TMA (T-Mobile)	C	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	0.02 0.02
(2) TMA 10"x8"x3" (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
(2) TMA 10"x8"x3" (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
(2) TMA 10"x8"x3" (T-Mobile)	C	From Leg	1.00 0.00 0.00	0.0000	147.00	No Ice 1/2" Ice	0.78 0.90	0.29 0.38	0.02 0.02
4' Side Mount Standoff (Unknown)	C	From Leg	1.75 0.00 0.00	0.0000	99.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
16' x 2" Dia Omni (Unknown)	C	From Leg	3.50 0.00 0.00	0.0000	108.00	No Ice 1/2" Ice	3.20 4.83	3.20 4.83	0.04 0.06
4' Side Mount Standoff (Unknown)	C	From Leg	2.25 0.00 0.00	0.0000	117.75	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
15' x 2" Dia Omni (Unknown)	C	From Leg	4.50 0.00 0.00	0.0000	127.50	No Ice 1/2" Ice	3.00 4.53	3.00 4.53	0.04 0.06
5'0"x4.5" Pipe Mount (Unknown)	C	From Leg	0.75 0.00 0.00	0.0000	72.10	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	0.05 0.07

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	11 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
4' Side Mount Standoff (Unknown)	C	From Leg	1.50 0.00 0.00	0.0000	37.58	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
12' x 1-1/2" Dia Omni (Unknown)	C	From Leg	3.00 0.00 0.00	0.0000	45.41	No Ice 1/2" Ice	1.80 3.02	1.80 3.02	0.03 0.04
15' x 2" Dia Omni (Unknown)	A	From Leg	0.75 0.00 0.00	0.0000	167.50	No Ice 1/2" Ice	3.00 4.53	3.00 4.53	0.04 0.06
5'0"x4.5" Pipe Mount (Unknown)	A	From Leg	0.92 0.00 0.00	0.0000	102.20	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	0.05 0.07
5'0"x4.5" Pipe Mount (Unknown)	B	From Leg	0.75 0.00 0.00	0.0000	111.33	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	0.05 0.07
5'0"x4.5" Pipe Mount (Unknown)	B	From Leg	0.75 0.00 0.00	0.0000	93.83	No Ice 1/2" Ice	1.76 2.08	1.76 2.08	0.05 0.07
4' Side Mount Standoff (Vacant) (Unknown)	A	From Leg	1.50 0.00 0.00	0.0000	47.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft ²	Weight K
10 FT DISH (Unknown)	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	10.0000		72.00	10.00	No Ice 1/2" Ice	78.54 79.81	0.32 0.73
6 FT DISH (Unknown)	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	-50.0000		102.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29
8 FT DISH (Unknown)	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	-30.0000		111.33	8.00	No Ice 1/2" Ice	50.30 51.29	0.25 0.51
6 FT DISH (Unknown)	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		94.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.14 0.29

Tower Pressures - No Ice

$$G_H = 1.129$$

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	12 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 160.00-140.00	150.00	1.541	25	175.992	A	10.240	43.228	9.583	17.92	0.000	0.000
					B	12.095	19.183		30.64	0.000	0.000
					C	11.002	33.343		21.61	0.000	0.000
T2 140.00-120.00	130.00	1.48	24	195.998	A	8.136	62.549	9.599	13.58	0.000	0.000
					B	10.782	19.199		32.02	0.000	0.000
					C	9.555	39.299		19.65	0.000	0.000
T3 120.00-100.00	110.00	1.411	23	236.398	A	17.967	62.550	9.600	11.92	0.000	0.000
					B	23.744	21.004		21.45	0.000	0.000
					C	20.372	39.300		16.09	0.000	0.000
T4 100.00-80.00	90.00	1.332	22	278.441	A	25.881	64.637	11.687	12.91	0.000	0.000
					B	36.046	24.987		19.15	0.000	0.000
					C	28.695	41.387		16.68	0.000	0.000
T5 80.00-60.00	70.00	1.24	20	321.010	A	21.354	67.976	15.026	16.82	0.000	0.000
					B	32.450	28.326		24.72	0.000	0.000
					C	23.315	44.726		22.08	0.000	0.000
T6 60.00-40.00	50.00	1.126	18	363.083	A	19.571	71.524	18.574	20.39	0.000	0.000
					B	31.107	31.874		29.49	0.000	0.000
					C	21.130	48.274		26.76	0.000	0.000
T7 40.00-20.00	30.00	1	16	404.685	A	21.784	71.529	18.579	19.91	0.000	0.000
					B	33.208	32.817		28.14	0.000	0.000
					C	23.304	48.279		25.95	0.000	0.000
T8 20.00-0.00	10.00	1	16	448.055	A	28.936	53.890	22.120	26.71	0.000	0.000
					B	35.929	30.680		33.21	0.000	0.000
					C	29.959	39.940		31.65	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.129$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T1 160.00-140.00	150.00	1.541	19	0.5000	177.658	A	17.370	62.878	12.917	16.10	0.000	0.000
						B	11.580	35.533		27.42	0.000	0.000
						C	10.077	54.202		20.09	0.000	0.000
T2 140.00-120.00	130.00	1.48	18	0.5000	197.666	A	31.138	74.207	12.938	12.28	0.000	0.000
						B	10.375	34.393		28.90	0.000	0.000
						C	8.640	61.958		18.33	0.000	0.000
T3 120.00-100.00	110.00	1.411	17	0.5000	238.067	A	39.698	77.002	12.939	11.09	0.000	0.000
						B	23.512	41.083		20.03	0.000	0.000
						C	18.821	65.167		15.41	0.000	0.000
T4 100.00-80.00	90.00	1.332	16	0.5000	280.110	A	47.083	80.560	15.026	11.77	0.000	0.000
						B	37.291	47.722		17.68	0.000	0.000
						C	26.879	68.686		15.72	0.000	0.000
T5 80.00-60.00	70.00	1.24	15	0.5000	322.678	A	43.657	82.756	18.365	14.53	0.000	0.000
						B	35.101	49.210		21.78	0.000	0.000
						C	22.050	70.415		19.86	0.000	0.000
T6 60.00-40.00	50.00	1.126	14	0.5000	364.752	A	42.394	85.047	21.913	17.19	0.000	0.000
						B	34.434	51.063		25.63	0.000	0.000
						C	20.124	72.363		23.69	0.000	0.000
T7 40.00-20.00	30.00	1	12	0.5000	406.354	A	44.655	85.699	21.919	16.82	0.000	0.000
						B	36.457	54.203		24.18	0.000	0.000
						C	22.323	72.997		23.00	0.000	0.000
T8 20.00-0.00	10.00	1	12	0.5000	449.724	A	42.517	67.233	25.459	23.20	0.000	0.000
						B	37.789	48.372		29.55	0.000	0.000

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	13 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
						C	29.299	59.604		28.64	0.000	0.000

Tower Pressure - Service

$$G_H = 1.129$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 160.00-140.00	150.00	1.541	10	175.992	A	10.240	43.228	9.583	17.92	0.000	0.000
					B	12.095	19.183		30.64	0.000	0.000
					C	11.002	33.343		21.61	0.000	0.000
T2 140.00-120.00	130.00	1.48	9	195.998	A	8.136	62.549	9.599	13.58	0.000	0.000
					B	10.782	19.199		32.02	0.000	0.000
					C	9.555	39.299		19.65	0.000	0.000
T3 120.00-100.00	110.00	1.411	9	236.398	A	17.967	62.550	9.600	11.92	0.000	0.000
					B	23.744	21.004		21.45	0.000	0.000
					C	20.372	39.300		16.09	0.000	0.000
T4 100.00-80.00	90.00	1.332	9	278.441	A	25.881	64.637	11.687	12.91	0.000	0.000
					B	36.046	24.987		19.15	0.000	0.000
					C	28.695	41.387		16.68	0.000	0.000
T5 80.00-60.00	70.00	1.24	8	321.010	A	21.354	67.976	15.026	16.82	0.000	0.000
					B	32.450	28.326		24.72	0.000	0.000
					C	23.315	44.726		22.08	0.000	0.000
T6 60.00-40.00	50.00	1.126	7	363.083	A	19.571	71.524	18.574	20.39	0.000	0.000
					B	31.107	31.874		29.49	0.000	0.000
					C	21.130	48.274		26.76	0.000	0.000
T7 40.00-20.00	30.00	1	6	404.685	A	21.784	71.529	18.579	19.91	0.000	0.000
					B	33.208	32.817		28.14	0.000	0.000
					C	23.304	48.279		25.95	0.000	0.000
T8 20.00-0.00	10.00	1	6	448.055	A	28.936	53.890	22.120	26.71	0.000	0.000
					B	35.929	30.680		33.21	0.000	0.000
					C	29.959	39.940		31.65	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	1	1	36.915	2.41	120.27	A
			B	0.178	2.672	0.586	1	1	23.338			
			C	0.252	2.432	0.602	1	1	31.088			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	1	1	47.938	2.82	140.83	A
			B	0.153	2.761	0.582	1	1	21.955			
			C	0.249	2.44	0.602	1	1	33.201			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	1	1	57.321	3.28	164.02	A
			B	0.189	2.632	0.588	1	1	36.100			
			C	0.252	2.43	0.602	1	1	44.050			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	1	1	66.208	3.64	181.97	A
			B	0.219	2.533	0.595	1	1	50.901			

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page 14 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client	AT&T	Designed by Staff

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T5 80.00-60.00	0.97	2.46	C	0.252	2.432	0.602	1	1	53.623			
			A	0.278	2.355	0.609	1	1	62.785	3.39	169.53	A
			B	0.189	2.632	0.588	1	1	49.114			
			C	0.212	2.557	0.593	1	1	49.833			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	1	1	62.636	3.18	158.81	A
			B	0.173	2.687	0.585	1	1	49.764			
			C	0.191	2.626	0.589	1	1	49.545			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	1	1	64.495	2.98	148.93	A
			B	0.163	2.724	0.584	1	1	52.360			
			C	0.177	2.675	0.586	1	1	51.593			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	1	1	60.593	2.97	148.34	A
			B	0.149	2.776	0.581	1	1	53.763			
			C	0.156	2.75	0.582	1	1	53.221			
Sum Weight:	6.94	16.62						OTM	1930.57 kip-ft	24.65		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.825	1	35.123	2.29	114.44	A
			B	0.178	2.672	0.586	0.825	1	21.221			
			C	0.252	2.432	0.602	0.825	1	29.162			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.825	1	46.515	2.73	136.65	A
			B	0.153	2.761	0.582	0.825	1	20.068			
			C	0.249	2.44	0.602	0.825	1	31.529			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	0.825	1	54.177	3.10	155.02	A
			B	0.189	2.632	0.588	0.825	1	31.945			
			C	0.252	2.43	0.602	0.825	1	40.485			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.825	1	61.679	3.39	169.53	A
			B	0.219	2.533	0.595	0.825	1	44.593			
			C	0.252	2.432	0.602	0.825	1	48.601			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.825	1	59.048	3.19	159.44	A
			B	0.189	2.632	0.588	0.825	1	43.435			
			C	0.212	2.557	0.593	0.825	1	45.753			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.825	1	59.211	3.00	150.13	A
			B	0.173	2.687	0.585	0.825	1	44.321			
			C	0.191	2.626	0.589	0.825	1	45.848			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.825	1	60.683	2.80	140.13	A
			B	0.163	2.724	0.584	0.825	1	46.549			
			C	0.177	2.675	0.586	0.825	1	47.515			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.825	1	55.529	2.72	135.94	A
			B	0.149	2.776	0.581	0.825	1	47.475			
			C	0.156	2.75	0.582	0.825	1	47.978			
Sum Weight:	6.94	16.62						OTM	1829.41 kip-ft	23.23		

Tower Forces - No Ice - Wind 60 To Face

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	15 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.8	1	34.867	2.27	113.60	A
			B	0.178	2.672	0.586	0.8	1	20.919			
			C	0.252	2.432	0.602	0.8	1	28.887			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.8	1	46.311	2.72	136.05	A
			B	0.153	2.761	0.582	0.8	1	19.799			
			C	0.249	2.44	0.602	0.8	1	31.290			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	0.8	1	53.728	3.07	153.74	A
			B	0.189	2.632	0.588	0.8	1	31.351			
			C	0.252	2.43	0.602	0.8	1	39.976			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.8	1	61.032	3.35	167.75	A
			B	0.219	2.533	0.595	0.8	1	43.692			
			C	0.252	2.432	0.602	0.8	1	47.884			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.8	1	58.514	3.16	158.00	A
			B	0.189	2.632	0.588	0.8	1	42.624			
			C	0.212	2.557	0.593	0.8	1	45.170			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.8	1	58.722	2.98	148.89	A
			B	0.173	2.687	0.585	0.8	1	43.543			
			C	0.191	2.626	0.589	0.8	1	45.320			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.8	1	60.138	2.78	138.87	A
			B	0.163	2.724	0.584	0.8	1	45.718			
			C	0.177	2.675	0.586	0.8	1	46.933			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.8	1	54.806	2.68	134.17	A
			B	0.149	2.776	0.581	0.8	1	46.577			
			C	0.156	2.75	0.582	0.8	1	47.229			
Sum Weight:	6.94	16.62						OTM	1814.96 kip-ft	23.02		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.85	1	35.379	2.31	115.27	A
			B	0.178	2.672	0.586	0.85	1	21.524			
			C	0.252	2.432	0.602	0.85	1	29.437			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.85	1	46.718	2.74	137.25	A
			B	0.153	2.761	0.582	0.85	1	20.338			
			C	0.249	2.44	0.602	0.85	1	31.768			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	0.85	1	54.626	3.13	156.31	A
			B	0.189	2.632	0.588	0.85	1	32.538			
			C	0.252	2.43	0.602	0.85	1	40.994			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.85	1	62.326	3.43	171.30	A
			B	0.219	2.533	0.595	0.85	1	45.494			
			C	0.252	2.432	0.602	0.85	1	49.318			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.85	1	59.582	3.22	160.88	A
			B	0.189	2.632	0.588	0.85	1	44.246			
			C	0.212	2.557	0.593	0.85	1	46.336			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.85	1	59.701	3.03	151.37	A
			B	0.173	2.687	0.585	0.85	1	45.098			
			C	0.191	2.626	0.589	0.85	1	46.376			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.85	1	61.227	2.83	141.38	A
			B	0.163	2.724	0.584	0.85	1	47.379			
			C	0.177	2.675	0.586	0.85	1	48.098			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.85	1	56.252	2.75	137.72	A
			B	0.149	2.776	0.581	0.85	1	48.373			

RISATower CENTEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page 16 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client	AT&T	Designed by Staff

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
Sum Weight:	6.94	16.62	C	0.156	2.75	0.582	0.85	1 OTM	48.727 1843.86 kip-ft	23.43		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	1.60	1.59	A	0.452	1.971	0.674	1	1	59.753	2.52	125.88	A
			B	0.265	2.393	0.606	1	1	33.108			
			C	0.362	2.145	0.637	1	1	44.590			
T2 140.00-120.00	2.48	1.39	A	0.533	1.861	0.715	1	1	84.186	3.22	160.76	A
			B	0.226	2.51	0.596	1	1	30.879			
			C	0.357	2.155	0.635	1	1	47.987			
T3 120.00-100.00	2.53	2.44	A	0.49	1.913	0.693	1	1	93.025	3.48	174.11	A
			B	0.271	2.375	0.608	1	1	48.472			
			C	0.353	2.165	0.633	1	1	60.102			
T4 100.00-80.00	2.63	3.31	A	0.456	1.964	0.676	1	1	101.534	3.68	184.25	A
			B	0.303	2.287	0.617	1	1	66.734			
			C	0.341	2.192	0.629	1	1	70.108			
T5 80.00-60.00	2.66	3.50	A	0.392	2.081	0.648	1	1	97.306	3.48	174.07	A
			B	0.261	2.404	0.605	1	1	64.864			
			C	0.287	2.332	0.612	1	1	65.135			
T6 60.00-40.00	2.68	3.63	A	0.349	2.173	0.632	1	1	96.166	3.26	163.20	A
			B	0.234	2.485	0.598	1	1	64.971			
			C	0.254	2.427	0.603	1	1	63.744			
T7 40.00-20.00	2.69	3.83	A	0.321	2.242	0.622	1	1	98.002	3.05	152.40	A
			B	0.223	2.521	0.595	1	1	68.729			
			C	0.235	2.485	0.598	1	1	65.980			
T8 20.00-0.00	1.62	4.55	A	0.244	2.456	0.6	1	1	82.881	2.82	141.15	A
			B	0.192	2.624	0.589	1	1	66.267			
			C	0.198	2.604	0.59	1	1	64.461			
Sum Weight:	18.88	24.23						OTM	2036.85 kip-ft	25.52		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	1.60	1.59	A	0.452	1.971	0.674	0.825	1	56.713	2.39	119.48	A
			B	0.265	2.393	0.606	0.825	1	31.082			
			C	0.362	2.145	0.637	0.825	1	42.827			
T2 140.00-120.00	2.48	1.39	A	0.533	1.861	0.715	0.825	1	78.737	3.01	150.35	A
			B	0.226	2.51	0.596	0.825	1	29.063			
			C	0.357	2.155	0.635	0.825	1	46.475			
T3 120.00-100.00	2.53	2.44	A	0.49	1.913	0.693	0.825	1	86.078	3.22	161.10	A
			B	0.271	2.375	0.608	0.825	1	44.357			

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	17 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T4 100.00-80.00	2.63	3.31	C	0.353	2.165	0.633	0.825	1	56.809			
			A	0.456	1.964	0.676	0.825	1	93.294	3.39	169.29	A
			B	0.303	2.287	0.617	0.825	1	60.208			
			C	0.341	2.192	0.629	0.825	1	65.404			
T5 80.00-60.00	2.66	3.50	A	0.392	2.081	0.648	0.825	1	89.666	3.21	160.40	A
			B	0.261	2.404	0.605	0.825	1	58.721			
			C	0.287	2.332	0.612	0.825	1	61.276			
T6 60.00-40.00	2.68	3.63	A	0.349	2.173	0.632	0.825	1	88.747	3.01	150.61	A
			B	0.234	2.485	0.598	0.825	1	58.945			
			C	0.254	2.427	0.603	0.825	1	60.222			
T7 40.00-20.00	2.69	3.83	A	0.321	2.242	0.622	0.825	1	90.187	2.80	140.25	A
			B	0.223	2.521	0.595	0.825	1	62.349			
			C	0.235	2.485	0.598	0.825	1	62.073			
T8 20.00-0.00	1.62	4.55	A	0.244	2.456	0.6	0.825	1	75.441	2.57	128.48	A
			B	0.192	2.624	0.589	0.825	1	59.654			
			C	0.198	2.604	0.59	0.825	1	59.334			
Sum Weight:	18.88	24.23						OTM	1893.51 kip-ft	23.60		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	1.60	1.59	A	0.452	1.971	0.674	0.8	1	56.279	2.37	118.56	A
			B	0.265	2.393	0.606	0.8	1	30.792			
			C	0.362	2.145	0.637	0.8	1	42.575			
T2 140.00-120.00	2.48	1.39	A	0.533	1.861	0.715	0.8	1	77.958	2.98	148.86	A
			B	0.226	2.51	0.596	0.8	1	28.804			
			C	0.357	2.155	0.635	0.8	1	46.259			
T3 120.00-100.00	2.53	2.44	A	0.49	1.913	0.693	0.8	1	85.086	3.18	159.25	A
			B	0.271	2.375	0.608	0.8	1	43.770			
			C	0.353	2.165	0.633	0.8	1	56.338			
T4 100.00-80.00	2.63	3.31	A	0.456	1.964	0.676	0.8	1	92.117	3.34	167.16	A
			B	0.303	2.287	0.617	0.8	1	59.276			
			C	0.341	2.192	0.629	0.8	1	64.732			
T5 80.00-60.00	2.66	3.50	A	0.392	2.081	0.648	0.8	1	88.575	3.17	158.45	A
			B	0.261	2.404	0.605	0.8	1	57.844			
			C	0.287	2.332	0.612	0.8	1	60.725			
T6 60.00-40.00	2.68	3.63	A	0.349	2.173	0.632	0.8	1	87.687	2.98	148.81	A
			B	0.234	2.485	0.598	0.8	1	58.084			
			C	0.254	2.427	0.603	0.8	1	59.719			
T7 40.00-20.00	2.69	3.83	A	0.321	2.242	0.622	0.8	1	89.071	2.77	138.51	A
			B	0.223	2.521	0.595	0.8	1	61.437			
			C	0.235	2.485	0.598	0.8	1	61.515			
T8 20.00-0.00	1.62	4.55	A	0.244	2.456	0.6	0.8	1	74.378	2.53	126.67	A
			B	0.192	2.624	0.589	0.8	1	58.709			
			C	0.198	2.604	0.59	0.8	1	58.602			
Sum Weight:	18.88	24.23						OTM	1873.04 kip-ft	23.33		

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	18 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	plf	
T1 160.00-140.00	1.60	1.59	A	0.452	1.971	0.674	0.85	1	57.148	2.41	120.39	A
			B	0.265	2.393	0.606	0.85	1	31.371			
			C	0.362	2.145	0.637	0.85	1	43.079			
T2 140.00-120.00	2.48	1.39	A	0.533	1.861	0.715	0.85	1	79.515	3.04	151.84	A
			B	0.226	2.51	0.596	0.85	1	29.322			
			C	0.357	2.155	0.635	0.85	1	46.691			
T3 120.00-100.00	2.53	2.44	A	0.49	1.913	0.693	0.85	1	87.071	3.26	162.96	A
			B	0.271	2.375	0.608	0.85	1	44.945			
			C	0.353	2.165	0.633	0.85	1	57.279			
T4 100.00-80.00	2.63	3.31	A	0.456	1.964	0.676	0.85	1	94.471	3.43	171.43	A
			B	0.303	2.287	0.617	0.85	1	61.140			
			C	0.341	2.192	0.629	0.85	1	66.076			
T5 80.00-60.00	2.66	3.50	A	0.392	2.081	0.648	0.85	1	90.757	3.25	162.35	A
			B	0.261	2.404	0.605	0.85	1	59.599			
			C	0.287	2.332	0.612	0.85	1	61.827			
T6 60.00-40.00	2.68	3.63	A	0.349	2.173	0.632	0.85	1	89.806	3.05	152.41	A
			B	0.234	2.485	0.598	0.85	1	59.806			
			C	0.254	2.427	0.603	0.85	1	60.725			
T7 40.00-20.00	2.69	3.83	A	0.321	2.242	0.622	0.85	1	91.303	2.84	141.99	A
			B	0.223	2.521	0.595	0.85	1	63.260			
			C	0.235	2.485	0.598	0.85	1	62.631			
T8 20.00-0.00	1.62	4.55	A	0.244	2.456	0.6	0.85	1	76.504	2.61	130.29	A
			B	0.192	2.624	0.589	0.85	1	60.599			
			C	0.198	2.604	0.59	0.85	1	60.067			
Sum Weight:	18.88	24.23						OTM	1913.99 kip-ft	23.87		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K	e						ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	1	1	36.915	0.94	46.98	A
			B	0.178	2.672	0.586	1	1	23.338			
			C	0.252	2.432	0.602	1	1	31.088			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	1	1	47.938	1.10	55.01	A
			B	0.153	2.761	0.582	1	1	21.955			
			C	0.249	2.44	0.602	1	1	33.201			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	1	1	57.321	1.28	64.07	A
			B	0.189	2.632	0.588	1	1	36.100			
			C	0.252	2.43	0.602	1	1	44.050			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	1	1	66.208	1.42	71.08	A
			B	0.219	2.533	0.595	1	1	50.901			
			C	0.252	2.432	0.602	1	1	53.623			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	1	1	62.785	1.32	66.22	A
			B	0.189	2.632	0.588	1	1	49.114			
			C	0.212	2.557	0.593	1	1	49.833			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	1	1	62.636	1.24	62.04	A
			B	0.173	2.687	0.585	1	1	49.764			
			C	0.191	2.626	0.589	1	1	49.545			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	1	1	64.495	1.16	58.18	A
			B	0.163	2.724	0.584	1	1	52.360			

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	19 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T8 20.00-0.00	0.59	3.28	C	0.177	2.675	0.586	1	1	51.593			
			A	0.185	2.647	0.587	1	1	60.593	1.16	57.95	A
			B	0.149	2.776	0.581	1	1	53.763			
			C	0.156	2.75	0.582	1	1	53.221			
Sum Weight:	6.94	16.62						OTM	754.13 kip-ft	9.63		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.825	1	35.123	0.89	44.70	A
			B	0.178	2.672	0.586	0.825	1	21.221			
			C	0.252	2.432	0.602	0.825	1	29.162			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.825	1	46.515	1.07	53.38	A
			B	0.153	2.761	0.582	0.825	1	20.068			
			C	0.249	2.44	0.602	0.825	1	31.529			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	0.825	1	54.177	1.21	60.56	A
			B	0.189	2.632	0.588	0.825	1	31.945			
			C	0.252	2.43	0.602	0.825	1	40.485			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.825	1	61.679	1.32	66.22	A
			B	0.219	2.533	0.595	0.825	1	44.593			
			C	0.252	2.432	0.602	0.825	1	48.601			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.825	1	59.048	1.25	62.28	A
			B	0.189	2.632	0.588	0.825	1	43.435			
			C	0.212	2.557	0.593	0.825	1	45.753			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.825	1	59.211	1.17	58.64	A
			B	0.173	2.687	0.585	0.825	1	44.321			
			C	0.191	2.626	0.589	0.825	1	45.848			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.825	1	60.683	1.09	54.74	A
			B	0.163	2.724	0.584	0.825	1	46.549			
			C	0.177	2.675	0.586	0.825	1	47.515			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.825	1	55.529	1.06	53.10	A
			B	0.149	2.776	0.581	0.825	1	47.475			
			C	0.156	2.75	0.582	0.825	1	47.978			
Sum Weight:	6.94	16.62						OTM	714.61 kip-ft	9.07		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	R _R	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.8	1	34.867	0.89	44.38	A
			B	0.178	2.672	0.586	0.8	1	20.919			
			C	0.252	2.432	0.602	0.8	1	28.887			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.8	1	46.311	1.06	53.15	A
			B	0.153	2.761	0.582	0.8	1	19.799			

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	Page
	160' ROHN SSV Self-Support Lattice ~ Rev 2	20 of 34
	Project 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date 07:04:05 08/20/10
	Client AT&T	Designed by Staff

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T3 120.00-100.00	0.93	1.52	C	0.249	2.44	0.602	0.8	1	31.290			
			A	0.341	2.194	0.629	0.8	1	53.728	1.20	60.05	A
			B	0.189	2.632	0.588	0.8	1	31.351			
			C	0.252	2.43	0.602	0.8	1	39.976			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.8	1	61.032	1.31	65.53	A
			B	0.219	2.533	0.595	0.8	1	43.692			
			C	0.252	2.432	0.602	0.8	1	47.884			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.8	1	58.514	1.23	61.72	A
			B	0.189	2.632	0.588	0.8	1	42.624			
			C	0.212	2.557	0.593	0.8	1	45.170			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.8	1	58.722	1.16	58.16	A
			B	0.173	2.687	0.585	0.8	1	43.543			
			C	0.191	2.626	0.589	0.8	1	45.320			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.8	1	60.138	1.08	54.25	A
			B	0.163	2.724	0.584	0.8	1	45.718			
			C	0.177	2.675	0.586	0.8	1	46.933			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.8	1	54.806	1.05	52.41	A
			B	0.149	2.776	0.581	0.8	1	46.577			
			C	0.156	2.75	0.582	0.8	1	47.229			
Sum Weight:	6.94	16.62						OTM	708.97 kip-ft	8.99		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 160.00-140.00	0.60	1.00	A	0.304	2.286	0.617	0.85	1	35.379	0.90	45.03	A
			B	0.178	2.672	0.586	0.85	1	21.524			
			C	0.252	2.432	0.602	0.85	1	29.437			
T2 140.00-120.00	0.92	0.86	A	0.361	2.147	0.636	0.85	1	46.718	1.07	53.61	A
			B	0.153	2.761	0.582	0.85	1	20.338			
			C	0.249	2.44	0.602	0.85	1	31.768			
T3 120.00-100.00	0.93	1.52	A	0.341	2.194	0.629	0.85	1	54.626	1.22	61.06	A
			B	0.189	2.632	0.588	0.85	1	32.538			
			C	0.252	2.43	0.602	0.85	1	40.994			
T4 100.00-80.00	0.96	2.08	A	0.325	2.231	0.624	0.85	1	62.326	1.34	66.92	A
			B	0.219	2.533	0.595	0.85	1	45.494			
			C	0.252	2.432	0.602	0.85	1	49.318			
T5 80.00-60.00	0.97	2.46	A	0.278	2.355	0.609	0.85	1	59.582	1.26	62.85	A
			B	0.189	2.632	0.588	0.85	1	44.246			
			C	0.212	2.557	0.593	0.85	1	46.336			
T6 60.00-40.00	0.98	2.65	A	0.251	2.435	0.602	0.85	1	59.701	1.18	59.13	A
			B	0.173	2.687	0.585	0.85	1	45.098			
			C	0.191	2.626	0.589	0.85	1	46.376			
T7 40.00-20.00	0.98	2.78	A	0.231	2.497	0.597	0.85	1	61.227	1.10	55.23	A
			B	0.163	2.724	0.584	0.85	1	47.379			
			C	0.177	2.675	0.586	0.85	1	48.098			
T8 20.00-0.00	0.59	3.28	A	0.185	2.647	0.587	0.85	1	56.252	1.08	53.80	A
			B	0.149	2.776	0.581	0.85	1	48.373			
			C	0.156	2.75	0.582	0.85	1	48.727			
Sum Weight:	6.94	16.62						OTM	720.26 kip-ft	9.15		

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	21 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	6.55					
Bracing Weight	10.07					
Total Member Self-Weight	16.62			14.45	4.68	
Total Weight	29.42			14.45	4.68	
Wind 0 deg - No Ice		0.45	-35.27	-3348.85	-16.17	-0.16
Wind 30 deg - No Ice		18.66	-29.23	-2790.77	-1763.57	8.65
Wind 45 deg - No Ice		25.65	-23.61	-2249.20	-2442.82	9.23
Wind 60 deg - No Ice		30.80	-16.59	-1572.85	-2945.04	9.50
Wind 90 deg - No Ice		35.84	-0.13	18.61	-3424.03	9.50
Wind 120 deg - No Ice		32.44	17.00	1655.64	-3073.55	9.02
Wind 135 deg - No Ice		25.67	23.36	2283.33	-2460.61	9.21
Wind 150 deg - No Ice		18.19	29.38	2850.21	-1750.23	9.28
Wind 180 deg - No Ice		-0.03	33.84	3283.09	-13.84	2.33
Wind 210 deg - No Ice		-18.37	29.13	2815.27	1757.34	-7.20
Wind 225 deg - No Ice		-25.37	23.48	2271.99	2439.11	-7.92
Wind 240 deg - No Ice		-32.04	17.26	1651.05	3052.13	-8.47
Wind 270 deg - No Ice		-35.63	-0.04	-2.14	3427.70	-11.97
Wind 300 deg - No Ice		-31.01	-16.40	-1587.16	2995.20	-13.19
Wind 315 deg - No Ice		-25.75	-23.62	-2274.37	2487.71	-15.11
Wind 330 deg - No Ice		-18.67	-29.26	-2807.72	1807.09	-15.03
Member Ice	7.61					
Total Weight Ice	52.40			34.23	15.84	
Wind 0 deg - Ice		0.34	-34.78	-3260.99	0.21	1.90
Wind 30 deg - Ice		17.82	-28.50	-2688.26	-1669.69	6.98
Wind 45 deg - Ice		24.56	-23.00	-2161.45	-2320.62	6.65
Wind 60 deg - Ice		29.50	-16.12	-1503.38	-2801.02	6.13
Wind 90 deg - Ice		34.52	-0.09	37.56	-3273.01	4.91
Wind 120 deg - Ice		31.57	16.91	1651.11	-2964.61	3.70
Wind 135 deg - Ice		24.57	22.81	2234.25	-2334.28	4.16
Wind 150 deg - Ice		17.46	28.62	2780.31	-1659.70	4.36
Wind 180 deg - Ice		-0.02	32.75	3181.79	1.47	0.06
Wind 210 deg - Ice		-17.60	28.43	2753.53	1689.35	-5.89
Wind 225 deg - Ice		-24.34	22.89	2225.34	2342.28	-5.66
Wind 240 deg - Ice		-31.26	17.10	1647.24	2972.76	-5.32
Wind 270 deg - Ice		-34.35	-0.03	21.40	3300.38	-6.80
Wind 300 deg - Ice		-29.67	-15.98	-1514.63	2864.00	-7.25
Wind 315 deg - Ice		-24.64	-23.01	-2181.00	2379.59	-8.67
Wind 330 deg - Ice		-17.83	-28.53	-2701.44	1727.69	-8.76
Total Weight	29.42			14.45	4.68	
Wind 0 deg - Service		0.18	-13.78	-1311.14	-6.22	-0.06
Wind 30 deg - Service		7.29	-11.42	-1093.14	-688.80	3.38
Wind 45 deg - Service		10.02	-9.22	-881.58	-954.13	3.60
Wind 60 deg - Service		12.03	-6.48	-617.39	-1150.31	3.71
Wind 90 deg - Service		14.00	-0.05	4.28	-1337.41	3.71
Wind 120 deg - Service		12.67	6.64	643.74	-1200.51	3.52
Wind 135 deg - Service		10.03	9.12	888.93	-961.08	3.60
Wind 150 deg - Service		7.10	11.48	1110.37	-683.59	3.63
Wind 180 deg - Service		-0.01	13.22	1279.47	-5.31	0.91
Wind 210 deg - Service		-7.17	11.38	1096.72	686.56	-2.81
Wind 225 deg - Service		-9.91	9.17	884.50	952.87	-3.10
Wind 240 deg - Service		-12.51	6.74	641.95	1192.33	-3.31
Wind 270 deg - Service		-13.92	-0.01	-3.83	1339.04	-4.68
Wind 300 deg - Service		-12.11	-6.41	-622.97	1170.10	-5.15
Wind 315 deg - Service		-10.06	-9.23	-891.42	971.86	-5.90

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	22 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Load Case	Vertical Forces	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 330 deg - Service	K	-7.29	-11.43	-1099.76	705.99	-5.87

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+ Wind 0 deg - No Ice
3	Dead+ Wind 30 deg - No Ice
4	Dead+ Wind 45 deg - No Ice
5	Dead+ Wind 60 deg - No Ice
6	Dead+ Wind 90 deg - No Ice
7	Dead+ Wind 120 deg - No Ice
8	Dead+ Wind 135 deg - No Ice
9	Dead+ Wind 150 deg - No Ice
10	Dead+ Wind 180 deg - No Ice
11	Dead+ Wind 210 deg - No Ice
12	Dead+ Wind 225 deg - No Ice
13	Dead+ Wind 240 deg - No Ice
14	Dead+ Wind 270 deg - No Ice
15	Dead+ Wind 300 deg - No Ice
16	Dead+ Wind 315 deg - No Ice
17	Dead+ Wind 330 deg - No Ice
18	Dead+ Ice+Temp
19	Dead+ Wind 0 deg+Ice+Temp
20	Dead+ Wind 30 deg+Ice+Temp
21	Dead+ Wind 45 deg+Ice+Temp
22	Dead+ Wind 60 deg+Ice+Temp
23	Dead+ Wind 90 deg+Ice+Temp
24	Dead+ Wind 120 deg+Ice+Temp
25	Dead+ Wind 135 deg+Ice+Temp
26	Dead+ Wind 150 deg+Ice+Temp
27	Dead+ Wind 180 deg+Ice+Temp
28	Dead+ Wind 210 deg+Ice+Temp
29	Dead+ Wind 225 deg+Ice+Temp
30	Dead+ Wind 240 deg+Ice+Temp
31	Dead+ Wind 270 deg+Ice+Temp
32	Dead+ Wind 300 deg+Ice+Temp
33	Dead+ Wind 315 deg+Ice+Temp
34	Dead+ Wind 330 deg+Ice+Temp
35	Dead+ Wind 0 deg - Service
36	Dead+ Wind 30 deg - Service
37	Dead+ Wind 45 deg - Service
38	Dead+ Wind 60 deg - Service
39	Dead+ Wind 90 deg - Service
40	Dead+ Wind 120 deg - Service
41	Dead+ Wind 135 deg - Service
42	Dead+ Wind 150 deg - Service
43	Dead+ Wind 180 deg - Service
44	Dead+ Wind 210 deg - Service
45	Dead+ Wind 225 deg - Service
46	Dead+ Wind 240 deg - Service
47	Dead+ Wind 270 deg - Service
48	Dead+ Wind 300 deg - Service
49	Dead+ Wind 315 deg - Service

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	23 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Comb. No.	Description
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	160 - 140	Leg	Max Tension	10	17.34	0.02	1.33
			Max. Compression	7	-21.49	-0.93	-0.57
			Max. Mx	7	-21.49	1.21	0.74
			Max. My	2	-21.42	-0.02	-1.41
			Max. Vy	7	4.26	-0.93	-0.57
			Max. Vx	2	-5.00	0.02	1.09
		Diagonal	Max Tension	17	3.98	0.00	0.00
			Max. Compression	9	-3.99	0.00	0.00
			Max. Mx	34	1.69	0.02	-0.00
			Max. My	17	-3.94	0.00	-0.00
			Max. Vy	34	0.01	0.02	-0.00
			Max. Vx	17	-0.00	0.00	0.00
		Top Girt	Max Tension	13	0.08	0.00	0.00
			Max. Compression	22	-0.14	0.00	0.00
			Max. Mx	18	-0.06	-0.08	0.00
			Max. My	3	0.01	0.00	0.00
			Max. Vy	18	0.04	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
T2	140 - 120	Leg	Max Tension	10	33.82	0.03	-0.05
			Max. Compression	7	-39.11	-0.08	0.03
			Max. Mx	7	-24.92	1.09	0.03
			Max. My	6	-1.79	0.02	0.33
			Max. Vy	7	0.22	1.09	0.03
			Max. Vx	34	-0.10	0.03	0.04
		Diagonal	Max Tension	9	3.52	0.00	0.00
			Max. Compression	17	-3.71	0.00	0.00
			Max. Mx	24	3.06	0.03	-0.00
			Max. My	33	-3.32	0.00	-0.01
			Max. Vy	32	0.02	0.03	0.00
			Max. Vx	33	0.00	0.00	0.00
T3	120 - 100	Leg	Max Tension	10	52.96	-0.09	0.10
			Max. Compression	24	-61.52	0.03	0.18
			Max. Mx	15	46.14	0.43	0.22
			Max. My	11	-3.60	0.25	-0.78
			Max. Vy	15	-0.36	-0.28	0.22
			Max. Vx	11	0.66	-0.19	0.54
		Diagonal	Max Tension	14	4.84	0.00	0.00
			Max. Compression	14	-4.88	0.00	0.00
			Max. Mx	24	3.58	0.06	-0.00
			Max. My	31	-4.17	0.00	0.01
			Max. Vy	24	-0.02	0.06	-0.00
			Max. Vx	31	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	1.07	0.00	0.00
			Max. Compression	24	-1.07	0.00	0.00
			Max. Mx	18	0.11	-0.10	0.00
			Max. My	25	-0.20	0.00	0.00
			Max. Vy	18	-0.03	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
T4	100 - 80	Leg	Max Tension	15	74.70	0.16	-0.05
			Max. Compression	24	-86.74	-0.28	-0.19
			Max. Mx	24	-86.69	0.51	-0.07

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	24 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T5	80 - 60	Diagonal	Max. My	17	-6.89	-0.01	0.78
			Max. Vy	24	0.24	0.51	-0.07
			Max. Vx	3	0.54	-0.04	-0.52
			Max Tension	14	5.44	0.00	0.00
			Max. Compression	14	-5.47	0.00	0.00
			Max. Mx	24	4.15	0.08	-0.00
			Max. My	21	-3.55	0.03	-0.01
			Max. Vy	24	-0.03	0.08	-0.00
			Max. Vx	21	0.00	0.00	0.00
			Max Tension	24	1.50	0.00	0.00
		Secondary Horizontal	Max. Compression	24	-1.50	0.00	0.00
			Max. Mx	18	0.16	-0.16	0.00
			Max. My	33	1.05	0.00	0.00
			Max. Vy	18	-0.05	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
			Max Tension	15	94.95	-0.16	0.41
			Max. Compression	30	-110.34	-0.56	-0.00
			Max. Mx	30	-110.18	0.93	0.01
			Max. My	17	-8.43	0.02	1.41
			Max. Vy	5	0.58	-0.41	-0.13
		Diagonal	Max. Vx	17	-1.03	0.02	1.41
			Max Tension	6	7.43	0.00	0.00
			Max. Compression	14	-7.47	0.00	0.00
			Max. Mx	32	5.16	0.11	-0.01
			Max. My	27	-5.01	0.06	0.01
			Max. Vy	32	0.04	0.10	0.01
			Max. Vx	27	-0.00	0.00	0.00
			Max Tension	30	1.91	0.00	0.00
		Secondary Horizontal	Max. Compression	30	-1.91	0.00	0.00
			Max. Mx	18	0.19	-0.25	0.00
			Max. My	31	0.18	0.00	0.01
			Max. Vy	18	0.06	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T6	60 - 40	Leg	Max Tension	15	117.40	-0.47	-0.00
			Max. Compression	30	-136.69	-0.34	-0.01
			Max. Mx	32	105.56	-1.13	0.03
			Max. My	17	-11.34	-0.02	0.45
			Max. Vy	24	0.20	1.00	0.02
			Max. Vx	14	-0.09	-0.04	-0.41
		Diagonal	Max Tension	23	7.50	0.00	0.00
			Max. Compression	14	-7.62	0.00	0.00
			Max. Mx	24	5.40	0.16	-0.01
			Max. My	34	-4.23	0.11	0.02
			Max. Vy	32	0.05	0.16	-0.01
			Max. Vx	34	-0.00	0.00	0.00
T7	40 - 20	Leg	Max Tension	15	137.76	-0.31	0.01
			Max. Compression	30	-161.56	-0.87	0.00
			Max. Mx	32	123.84	-1.85	0.00
			Max. My	9	-4.35	-0.06	-0.58
			Max. Vy	22	0.30	-1.84	-0.01
		Diagonal	Max. Vx	11	0.10	-0.07	0.57
			Max Tension	23	7.80	0.00	0.00
			Max. Compression	23	-7.69	0.00	0.00
			Max. Mx	32	5.25	0.19	-0.02
			Max. My	32	-6.65	0.13	0.02
			Max. Vy	32	0.06	0.19	-0.02
			Max. Vx	32	-0.00	0.00	0.00
T8	20 - 0	Leg	Max Tension	15	157.12	-0.57	0.03
			Max. Compression	30	-185.32	-0.00	0.00

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	25 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max. Mx	24	-171.68	2.12	-0.00
			Max. My	14	-9.10	-0.07	-1.17
			Max. Vy	22	-0.36	-1.84	-0.01
			Max. Vx	11	0.18	-0.08	1.14
			Max Tension	23	8.89	0.00	0.00
			Max. Compression	23	-8.73	0.00	0.00
			Max. Mx	33	3.79	0.30	-0.02
			Max. My	31	-8.61	0.19	0.03
			Max. Vy	32	0.08	0.30	0.02
			Max. Vx	31	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	190.07	17.48	-9.84
	Max. H _x	13	185.64	19.35	-10.82
	Max. H _z	21	-139.51	-17.36	10.52
	Min. Vert	5	-159.34	-17.27	9.61
	Min. H _x	22	-143.93	-18.11	10.23
	Min. H _z	13	185.64	19.35	-10.82
Leg B	Max. Vert	24	189.81	-17.55	-9.86
	Max. H _x	32	-146.99	18.20	10.24
	Max. H _z	33	-142.60	17.46	10.52
	Min. Vert	15	-161.91	17.40	9.54
	Min. H _x	7	186.69	-19.49	-10.83
	Min. H _z	7	186.69	-19.49	-10.83
Leg A	Max. Vert	19	183.11	-0.00	19.50
	Max. H _x	14	9.92	2.49	0.81
	Max. H _z	2	179.56	-0.05	21.51
	Min. Vert	10	-156.62	0.07	-19.13
	Min. H _x	6	8.86	-2.58	0.85
	Min. H _z	27	-144.16	0.00	-20.36

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	29.42	0.00	0.00	14.45	4.68	0.00
Dead+ Wind 0 deg - No Ice	29.42	0.45	-35.27	-3359.25	-16.17	-0.17
Dead+ Wind 30 deg - No Ice	29.42	18.66	-29.23	-2799.47	-1768.96	8.65
Dead+ Wind 45 deg - No Ice	29.42	25.65	-23.61	-2256.20	-2450.33	9.27
Dead+ Wind 60 deg - No Ice	29.42	30.80	-16.59	-1577.73	-2954.13	9.56
Dead+ Wind 90 deg - No Ice	29.42	35.84	-0.13	18.73	-3434.58	9.57
Dead+ Wind 120 deg - No Ice	29.42	32.44	17.00	1660.88	-3082.95	9.09
Dead+ Wind 135 deg - No Ice	29.42	25.67	23.36	2290.54	-2468.18	9.27
Dead+ Wind 150 deg - No Ice	29.42	18.19	29.38	2859.14	-1755.62	9.32
Dead+ Wind 180 deg - No Ice	29.42	-0.03	33.84	3293.35	-13.93	2.35
Dead+ Wind 210 deg - No Ice	29.42	-18.37	29.13	2824.09	1762.70	-7.21
Dead+ Wind 225 deg - No Ice	29.42	-25.37	23.48	2279.13	2446.60	-7.96
Dead+ Wind 240 deg - No Ice	29.42	-32.04	17.26	1656.21	3061.48	-8.53

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	26 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Dead+ Wind 270 deg - No Ice	29.42	-35.63	-0.04	-2.14	3438.28	-12.04
Dead+ Wind 300 deg - No Ice	29.42	-31.01	-16.40	-1592.15	3004.47	-13.26
Dead+ Wind 315 deg - No Ice	29.42	-25.75	-23.62	-2281.49	2495.40	-15.17
Dead+ Wind 330 deg - No Ice	29.42	-18.67	-29.26	-2816.49	1812.67	-15.07
Dead+ Ice+Temp	52.40	0.00	-0.00	34.41	15.91	0.00
Dead+ Wind 0 deg+Ice+Temp	52.40	0.34	-34.78	-3277.89	0.28	1.84
Dead+ Wind 30 deg+Ice+Temp	52.40	17.82	-28.50	-2702.23	-1678.22	7.01
Dead+ Wind 45 deg+Ice+Temp	52.40	24.56	-23.00	-2172.68	-2332.54	6.72
Dead+ Wind 60 deg+Ice+Temp	52.40	29.50	-16.12	-1511.18	-2815.47	6.24
Dead+ Wind 90 deg+Ice+Temp	52.40	34.52	-0.09	37.82	-3289.87	5.06
Dead+ Wind 120 deg+Ice+Temp	52.40	31.57	16.91	1659.81	-2979.75	3.87
Dead+ Wind 135 deg+Ice+Temp	52.40	24.57	22.81	2245.98	-2346.29	4.31
Dead+ Wind 150 deg+Ice+Temp	52.40	17.46	28.62	2794.82	-1668.25	4.50
Dead+ Wind 180 deg+Ice+Temp	52.40	-0.02	32.75	3198.38	1.41	0.12
Dead+ Wind 210 deg+Ice+Temp	52.40	-17.60	28.43	2767.88	1697.97	-5.92
Dead+ Wind 225 deg+Ice+Temp	52.40	-24.34	22.89	2236.96	2354.31	-5.73
Dead+ Wind 240 deg+Ice+Temp	52.40	-31.26	17.10	1655.83	2987.96	-5.43
Dead+ Wind 270 deg+Ice+Temp	52.40	-34.35	-0.03	21.51	3317.40	-6.95
Dead+ Wind 300 deg+Ice+Temp	52.40	-29.67	-15.98	-1522.58	2878.79	-7.41
Dead+ Wind 315 deg+Ice+Temp	52.40	-24.64	-23.01	-2192.39	2391.86	-8.83
Dead+ Wind 330 deg+Ice+Temp	52.40	-17.83	-28.53	-2715.50	1736.58	-8.90
Dead+ Wind 0 deg - Service	29.42	0.18	-13.78	-1303.39	-3.45	-0.07
Dead+ Wind 30 deg - Service	29.42	7.29	-11.42	-1084.73	-688.14	3.39
Dead+ Wind 45 deg - Service	29.42	10.02	-9.22	-872.51	-954.31	3.62
Dead+ Wind 60 deg - Service	29.42	12.03	-6.48	-607.48	-1151.11	3.73
Dead+ Wind 90 deg - Service	29.42	14.00	-0.05	16.15	-1338.79	3.74
Dead+ Wind 120 deg - Service	29.42	12.67	6.64	657.62	-1201.44	3.55
Dead+ Wind 135 deg - Service	29.42	10.03	9.12	903.59	-961.29	3.62
Dead+ Wind 150 deg - Service	29.42	7.10	11.48	1125.70	-682.94	3.64
Dead+ Wind 180 deg - Service	29.42	-0.01	13.22	1295.32	-2.58	0.92
Dead+ Wind 210 deg - Service	29.42	-7.17	11.38	1112.00	691.43	-2.82
Dead+ Wind 225 deg - Service	29.42	-9.91	9.17	899.12	958.58	-3.11
Dead+ Wind 240 deg - Service	29.42	-12.51	6.74	655.79	1198.77	-3.33
Dead+ Wind 270 deg - Service	29.42	-13.92	-0.01	7.99	1345.96	-4.70
Dead+ Wind 300 deg - Service	29.42	-12.11	-6.41	-613.12	1176.49	-5.18
Dead+ Wind 315 deg - Service	29.42	-10.06	-9.23	-882.39	977.63	-5.93
Dead+ Wind 330 deg - Service	29.42	-7.29	-11.43	-1091.38	710.94	-5.89

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-29.42	0.00	0.00	29.42	0.00	0.000%
2	0.45	-29.42	-35.27	-0.45	29.42	35.27	0.000%
3	18.66	-29.42	-29.23	-18.66	29.42	29.23	0.002%
4	25.65	-29.42	-23.61	-25.65	29.42	23.61	0.000%
5	30.80	-29.42	-16.59	-30.80	29.42	16.59	0.000%
6	35.84	-29.42	-0.13	-35.84	29.42	0.13	0.000%
7	32.44	-29.42	17.00	-32.44	29.42	-17.00	0.000%
8	25.67	-29.42	23.36	-25.67	29.42	-23.36	0.000%
9	18.19	-29.42	29.38	-18.19	29.42	-29.38	0.000%
10	-0.03	-29.42	33.84	0.03	29.42	-33.84	0.000%
11	-18.37	-29.42	29.13	18.37	29.42	-29.13	0.000%
12	-25.37	-29.42	23.48	25.37	29.42	-23.48	0.000%
13	-32.04	-29.42	17.26	32.04	29.42	-17.26	0.000%
14	-35.63	-29.42	-0.04	35.63	29.42	0.04	0.000%
15	-31.01	-29.42	-16.40	31.01	29.42	16.40	0.000%

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	27 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
16	-25.75	-29.42	-23.62	25.75	29.42	23.62	0.000%
17	-18.67	-29.42	-29.26	18.67	29.42	29.26	0.001%
18	0.00	-52.40	0.00	-0.00	52.40	0.00	0.000%
19	0.34	-52.40	-34.78	-0.34	52.40	34.78	0.000%
20	17.82	-52.40	-28.50	-17.82	52.40	28.50	0.000%
21	24.56	-52.40	-23.00	-24.56	52.40	23.00	0.000%
22	29.50	-52.40	-16.12	-29.50	52.40	16.12	0.000%
23	34.52	-52.40	-0.09	-34.52	52.40	0.09	0.000%
24	31.57	-52.40	16.91	-31.57	52.40	-16.91	0.000%
25	24.57	-52.40	22.81	-24.57	52.40	-22.81	0.000%
26	17.46	-52.40	28.62	-17.46	52.40	-28.62	0.000%
27	-0.02	-52.40	32.75	0.02	52.40	-32.75	0.000%
28	-17.60	-52.40	28.43	17.60	52.40	-28.43	0.000%
29	-24.34	-52.40	22.89	24.34	52.40	-22.89	0.000%
30	-31.26	-52.40	17.10	31.26	52.40	-17.10	0.000%
31	-34.35	-52.40	-0.03	34.35	52.40	0.03	0.000%
32	-29.67	-52.40	-15.98	29.67	52.40	15.98	0.000%
33	-24.64	-52.40	-23.01	24.64	52.40	23.01	0.000%
34	-17.83	-52.40	-28.53	17.83	52.40	28.53	0.000%
35	0.18	-29.42	-13.78	-0.18	29.42	13.78	0.000%
36	7.29	-29.42	-11.42	-7.29	29.42	11.42	0.000%
37	10.02	-29.42	-9.22	-10.02	29.42	9.22	0.000%
38	12.03	-29.42	-6.48	-12.03	29.42	6.48	0.000%
39	14.00	-29.42	-0.05	-14.00	29.42	0.05	0.000%
40	12.67	-29.42	6.64	-12.67	29.42	-6.64	0.000%
41	10.03	-29.42	9.12	-10.03	29.42	-9.12	0.000%
42	7.10	-29.42	11.48	-7.10	29.42	-11.48	0.000%
43	-0.01	-29.42	13.22	0.01	29.42	-13.22	0.000%
44	-7.17	-29.42	11.38	7.17	29.42	-11.38	0.000%
45	-9.91	-29.42	9.17	9.91	29.42	-9.17	0.000%
46	-12.51	-29.42	6.74	12.51	29.42	-6.74	0.000%
47	-13.92	-29.42	-0.01	13.92	29.42	0.01	0.000%
48	-12.11	-29.42	-6.41	12.11	29.42	6.41	0.000%
49	-10.06	-29.42	-9.23	10.06	29.42	9.23	0.000%
50	-7.29	-29.42	-11.43	7.29	29.42	11.43	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	4	0.00000001	0.00000845
3	Yes	4	0.00000001	0.00000967
4	Yes	4	0.00000001	0.00000888
5	Yes	4	0.00000001	0.00000784
6	Yes	4	0.00000001	0.00000712
7	Yes	4	0.00000001	0.00000918
8	Yes	4	0.00000001	0.00000868
9	Yes	4	0.00000001	0.00000595
10	Yes	4	0.00000001	0.00000605
11	Yes	4	0.00000001	0.00001196
12	Yes	4	0.00000001	0.00001319
13	Yes	4	0.00000001	0.00001221
14	Yes	4	0.00000001	0.00000688
15	Yes	4	0.00000001	0.00000692
16	Yes	4	0.00000001	0.00000680

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	28 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

17	Yes	4	0.00000001	0.00000559
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000748
20	Yes	4	0.00000001	0.00000964
21	Yes	4	0.00000001	0.00000948
22	Yes	4	0.00000001	0.00000900
23	Yes	4	0.00000001	0.00000797
24	Yes	4	0.00000001	0.00000825
25	Yes	4	0.00000001	0.00000789
26	Yes	4	0.00000001	0.00000695
27	Yes	4	0.00000001	0.00000791
28	Yes	4	0.00000001	0.00001170
29	Yes	4	0.00000001	0.00001216
30	Yes	4	0.00000001	0.00001102
31	Yes	4	0.00000001	0.00000705
32	Yes	4	0.00000001	0.00000790
33	Yes	4	0.00000001	0.00000751
34	Yes	4	0.00000001	0.00000591
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 140	4.978	40	0.2871	0.0087
T2	140 - 120	3.759	40	0.2706	0.0091
T3	120 - 100	2.682	40	0.2230	0.0102
T4	100 - 80	1.818	40	0.1728	0.0086
T5	80 - 60	1.150	40	0.1265	0.0079
T6	60 - 40	0.663	40	0.0901	0.0058
T7	40 - 20	0.316	40	0.0608	0.0035
T8	20 - 0	0.094	40	0.0296	0.0015

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169.00	(2) AM-X-CD-14-65-00TT-RET	40	4.978	0.2871	0.0087	123874
167.50	15' x 2" Dia Omni	40	4.978	0.2871	0.0087	123874

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	29 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
163.00	P8 x18-ft Pipe Mast	40	4.978	0.2871	0.0087	123874
156.50	LPA-80063-4CF	40	4.760	0.2856	0.0088	123874
156.00	Valmont 15' T-Frame P/N 860109	40	4.729	0.2854	0.0088	123874
147.00	15' Frame	40	4.176	0.2794	0.0089	47644
127.50	15' x 2" Dia Omni	40	3.062	0.2430	0.0099	23418
117.75	4' Side Mount Standoff	40	2.574	0.2171	0.0101	20983
111.33	8 FT DISH	40	2.281	0.2007	0.0096	22469
108.00	16' x 2" Dia Omni	40	2.138	0.1924	0.0093	23357
102.20	5'0"x4.5" Pipe Mount	40	1.903	0.1782	0.0088	25018
102.00	6 FT DISH	40	1.895	0.1777	0.0088	25070
99.00	4' Side Mount Standoff	40	1.780	0.1704	0.0086	25580
94.00	6 FT DISH	40	1.598	0.1583	0.0084	25507
93.83	5'0"x4.5" Pipe Mount	40	1.592	0.1579	0.0083	25499
72.10	5'0"x4.5" Pipe Mount	40	0.938	0.1108	0.0072	28389
72.00	10 FT DISH	40	0.935	0.1106	0.0072	28440
47.00	4' Side Mount Standoff (Vacant)	40	0.423	0.0710	0.0042	39942
45.41	12' x 1-1/2" Dia Omni	40	0.398	0.0687	0.0041	40447
37.58	4' Side Mount Standoff	40	0.282	0.0572	0.0032	39967

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	160 - 140	12.710	7	0.7326	0.0223
T2	140 - 120	9.598	7	0.6905	0.0233
T3	120 - 100	6.850	7	0.5690	0.0260
T4	100 - 80	4.645	7	0.4411	0.0221
T5	80 - 60	2.939	7	0.3232	0.0203
T6	60 - 40	1.695	7	0.2301	0.0148
T7	40 - 20	0.807	7	0.1555	0.0089
T8	20 - 0	0.239	7	0.0758	0.0038

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
169.00	(2) AM-X-CD-14-65-00TT-RET	7	12.710	0.7326	0.0223	48567
167.50	15' x 2" Dia Omni	7	12.710	0.7326	0.0223	48567
163.00	P8 x18-ft Pipe Mast	7	12.710	0.7326	0.0223	48567
156.50	LPA-80063-4CF	7	12.154	0.7288	0.0224	48567
156.00	Valmont 15' T-Frame P/N 860109	7	12.075	0.7282	0.0224	48567
147.00	15' Frame	7	10.663	0.7130	0.0227	18679
127.50	15' x 2" Dia Omni	7	7.821	0.6199	0.0254	9188
117.75	4' Side Mount Standoff	7	6.574	0.5540	0.0258	8240
111.33	8 FT DISH	7	5.828	0.5121	0.0247	8813
108.00	16' x 2" Dia Omni	7	5.463	0.4910	0.0238	9161
102.20	5'0"x4.5" Pipe Mount	7	4.862	0.4547	0.0225	9816
102.00	6 FT DISH	7	4.842	0.4535	0.0224	9837
99.00	4' Side Mount Standoff	7	4.549	0.4349	0.0219	10039
94.00	6 FT DISH	7	4.083	0.4042	0.0214	10014

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	30 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
93.83	5'0"x4.5" Pipe Mount	7	4.067	0.4031	0.0214	10011
72.10	5'0"x4.5" Pipe Mount	7	2.397	0.2831	0.0185	11139
72.00	10 FT DISH	7	2.391	0.2827	0.0185	11159
47.00	4' Side Mount Standoff (Vacant)	7	1.082	0.1814	0.0109	15629
45.41	12' x 1-1/2" Dia Omni	7	1.017	0.1756	0.0104	15829
37.58	4' Side Mount Standoff	7	0.721	0.1462	0.0082	15646

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	160	Leg	A325N	0.6250	4	4.33	13.28	0.326 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3.99	4.12	0.968 ✓	1.333	Bolt Shear
T2	140	Leg	A325N	0.6250	4	8.45	13.50	0.626 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3.71	4.12	0.901 ✓	1.333	Bolt Shear
T3	120	Leg	A325N	0.7500	4	13.23	19.44	0.680 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	4.88	4.12	1.183 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.7500	2	0.53	9.79	0.055 ✓	1.333	Member Bearing
T4	100	Leg	A325N	0.8750	4	18.65	26.46	0.705 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	5.44	4.76	1.144 ✓	1.333	Member Bearing
		Secondary Horizontal	A325X	0.6250	2	0.75	8.16	0.092 ✓	1.333	Member Bearing
T5	80	Leg	A325N	1.0000	4	23.69	34.56	0.686 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.47	6.44	1.160 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	0.96	9.20	0.104 ✓	1.333	Bolt Shear
T6	60	Leg	A325N	1.0000	4	29.35	34.56	0.849 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.62	6.44	1.183 ✓	1.333	Bolt Shear
T7	40	Leg	A325N	1.0000	6	22.96	34.56	0.664 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	7.80	6.44	1.211 ✓	1.333	Bolt Shear
T8	20	Leg	A354-BC	0.8750	6	26.19	24.80	1.056 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	8.89	8.16	1.090 ✓	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	31 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	ROHN 2.5 STD	20.00	4.75	60.2 K=1.00	22.690	1.7040	-21.49	38.66	0.556
T2	140 - 120	ROHN 2.5 STD	20.03	6.68	84.6 K=1.00	18.081	1.7040	-39.11	30.81	1.269
T3	120 - 100	ROHN 2.5 EH	20.03	3.44	44.7 K=1.00	25.153	2.2535	-61.52	56.68	1.085
T4	100 - 80	ROHN 3 EH	20.04	3.43	36.2 K=1.00	26.354	3.0159	-86.74	79.48	1.091
T5	80 - 60	ROHN 4 EH	20.03	5.18	42.1 K=1.00	25.539	4.4074	-110.35	112.56	0.980
T6	60 - 40	ROHN 5 EH	20.03	10.02	65.4 K=1.00	21.782	6.1120	-136.69	133.13	1.027
T7	40 - 20	ROHN 5 EH	20.04	10.02	65.4 K=1.00	21.778	6.1120	-161.56	133.11	1.214
T8	20 - 0	ROHN 6 EHS	20.03	10.02	54.0 K=1.00	23.713	6.7133	-185.32	159.19	1.164

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	L1 3/4x1 3/4x3/16	9.79	4.64	162.2 K=1.00	5.674	0.6211	-3.99	3.52	1.133
T2	140 - 120	L2x2x3/16	12.21	6.05	184.1 K=1.00	4.404	0.7150	-3.61	3.15	1.147
T3	120 - 100	L2 1/2x2 1/2x3/16	13.96	6.92	167.8 K=1.00	5.305	0.9020	-4.88	4.78	1.019
T4	100 - 80	L3x3x3/16	15.79	7.81	157.3 K=1.00	6.038	1.0900	-5.47	6.58	0.831
T5	80 - 60	L3x3x1/4	19.03	9.46	191.7 K=1.00	4.065	1.4400	-7.47	5.85	1.277
T6	60 - 40	L3 1/2x3 1/2x1/4	20.76	10.27	177.5 K=1.00	4.740	1.6900	-7.62	8.01	0.951
T7	40 - 20	L3 1/2x3 1/2x1/4	22.64	11.23	194.1 K=1.00	3.962	1.6900	-7.44	6.70	1.111
T8	20 - 0	L4x4x1/4	24.49	12.08	182.3 K=1.00	4.492	1.9400	-8.15	8.71	0.936

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T3	120 - 100	L2 1/2x2 1/2x3/16	12.25	11.53	224.7 K=0.80	2.956	0.9020	-1.07	2.67	0.400
T4	100 - 80	L3x3x3/16	14.31	13.59	220.7	3.065	1.0900	-1.50	3.34	0.450

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	32 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T5	80 - 60	L3x3x1/4	16.17	15.36	K=0.81 246.0 K=0.79	2.467	1.4400	-1.91	3.55	0.539 ✓ ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	L2 1/2x2 1/2x3/8	8.56	8.32	172.3 K=0.84	5.031	1.7300	-0.14	8.70	0.016 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	ROHN 2.5 STD	20.00	4.75	60.2	30.000	1.7040	17.34	51.12	0.339
T2	140 - 120	ROHN 2.5 STD	20.03	6.68	84.6	30.000	1.7040	33.82	51.12	0.662 ✓
T3	120 - 100	ROHN 2.5 EH	20.03	3.44	44.7	30.000	2.2535	52.96	67.61	0.783 ✓
T4	100 - 80	ROHN 3 EH	20.04	3.43	36.2	30.000	3.0159	74.70	90.48	0.826 ✓
T5	80 - 60	ROHN 4 EH	20.03	5.18	42.1	30.000	4.4074	94.95	132.22	0.718 ✓
T6	60 - 40	ROHN 5 EH	20.03	10.02	65.4	30.000	6.1120	117.40	183.36	0.640 ✓
T7	40 - 20	ROHN 5 EH	20.04	10.02	65.4	30.000	6.1120	137.76	183.36	0.751 ✓
T8	20 - 0	ROHN 6 EHS	20.03	10.02	54.0	30.000	6.7133	157.12	201.40	0.780 ✓ ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	L1 3/4x1 3/4x3/16	9.79	4.64	106.3	21.600	0.6211	3.98	13.42	0.297

RISATower CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	33 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T2	140 - 120	L2x2x3/16	11.12	5.51	109.4	21.600	0.7150	3.52	15.44	0.228 ✓
T3	120 - 100	L2 1/2x2 1/2x3/16	13.96	6.92	108.5	21.600	0.9020	4.84	19.48	0.248 ✓
T4	100 - 80	L3x3x3/16	15.17	7.50	97.3	21.600	1.0900	5.44	23.54	0.231 ✓
T5	80 - 60	L3x3x1/4	19.03	9.46	123.7	21.600	1.4400	7.43	31.10	0.239 ✓
T6	60 - 40	L3 1/2x3 1/2x1/4	20.76	10.27	114.5	21.600	1.6900	7.50	36.50	0.206 ✓
T7	40 - 20	L3 1/2x3 1/2x1/4	22.64	11.23	125.1	21.600	1.6900	7.80	36.50	0.214 ✓
T8	20 - 0	L4x4x1/4	24.49	12.08	117.3	21.600	1.9400	8.89	41.90	0.212 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T3	120 - 100	L2 1/2x2 1/2x3/16	12.25	11.53	185.3	21.600	0.9020	1.07	19.48	0.055 ✓
T4	100 - 80	L3x3x3/16	14.31	13.59	179.1	21.600	1.0900	1.50	23.54	0.064 ✓
T5	80 - 60	L3x3x1/4	16.17	15.36	203.8	21.600	1.4400	1.91	31.10	0.062 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T1	160 - 140	L2 1/2x2 1/2x3/8	8.56	8.32	132.6	21.600	1.7300	0.08	37.37	0.002 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T1	160 - 140	Leg	ROHN 2.5 STD	2	-21.49	51.54	41.7	Pass
T2	140 - 120	Leg	ROHN 2.5 STD	32	-39.11	41.07	95.2	Pass
T3	120 - 100	Leg	ROHN 2.5 EH	53	-61.52	75.56	81.4	Pass
T4	100 - 80	Leg	ROHN 3 EH	83	-86.74	105.95	81.9	Pass
T5	80 - 60	Leg	ROHN 4 EH	112	-110.35	150.05	73.5	Pass

<i>RISATower</i> CEN TEK Engineering, Inc. 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	160' ROHN SSV Self-Support Lattice ~ Rev 2	Page	34 of 34
	Project	10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	Date	07:04:05 08/20/10
	Client	AT&T	Designed by	Staff

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T6	60 - 40	Leg	ROHN 5 EH	133	-136.69	177.46	77.0	Pass
T7	40 - 20	Leg	ROHN 5 EH	148	-161.56	177.43	91.1	Pass
T8	20 - 0	Leg	ROHN 6 EHS	163	-185.32	212.20	87.3	Pass
T1	160 - 140	Diagonal	L1 3/4x1 3/4x3/16	9	-3.99	4.70	85.0	Pass
T2	140 - 120	Diagonal	L2x2x3/16	38	-3.61	4.20	86.0	Pass
T3	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	55	-4.88	6.38	76.5	Pass
							88.7 (b)	
T4	100 - 80	Diagonal	L3x3x3/16	85	-5.47	8.77	62.3	Pass
							85.8 (b)	
T5	80 - 60	Diagonal	L3x3x1/4	115	-7.47	7.80	95.8	Pass
T6	60 - 40	Diagonal	L3 1/2x3 1/2x1/4	136	-7.62	10.68	71.4	Pass
							88.7 (b)	
T7	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	151	-7.44	8.93	83.4	Pass
							90.8 (b)	
T8	20 - 0	Diagonal	L4x4x1/4	167	-8.15	11.62	70.2	Pass
							81.8 (b)	
T3	120 - 100	Secondary Horizontal	L2 1/2x2 1/2x3/16	61	-1.07	3.55	30.0	Pass
T4	100 - 80	Secondary Horizontal	L3x3x3/16	91	-1.50	4.45	33.8	Pass
T5	80 - 60	Secondary Horizontal	L3x3x1/4	121	-1.91	4.74	40.4	Pass
T1	160 - 140	Top Girt	L2 1/2x2 1/2x3/8	5	-0.14	11.60	1.2	Pass
							Summary	
							Leg (T2)	95.2 Pass
							Diagonal (T5)	95.8 Pass
							Secondary Horizontal (T5)	40.4 Pass
							Top Girt (T1)	1.2 Pass
							Bolt Checks	90.8 Pass
							RATING =	95.8 Pass

Subject:

Lattice Tower Pad and Pier Foundation
 Check

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Pad and Pier Foundation:

Input Data:

Tower Data

Max Uplift Force =	Uplift := 162-kips	(User Input from RISATower)	(Leg)
Max Shear Force =	Shear := 22-kips	(User Input from RISATower)	(Leg)
Max Compressive Force =	Compression := 190-kips	(User Input from RISATower)	(Leg)
Base Shear =	Shear _{tot} := 37-kips	(User Input from RISATower)	(Tower)
Base Compression =	Comp _{tot} := 29-kips	(User Input from RISATower)	(Tower)
Base Moment =	Moment := 3502-ft-kips	(User Input from RISATower)	(Tower)
Tower Height =	H _t := 160-ft	(User Input)	

Footing Data:

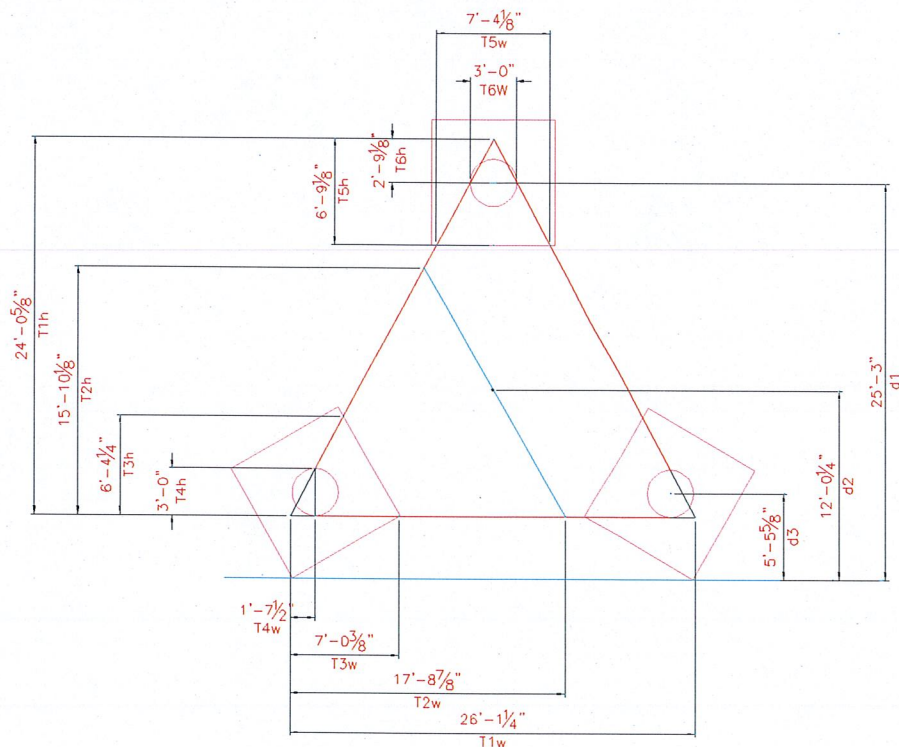
Overall Depth of Footing =	D _f := 11.0ft	(User Input)
Length of Pier =	L _p := 9.5ft	(User Input)
Extension of Pier Above Grade =	L _{pag} := 2.0ft	(User Input)
Diameter of Pier =	d _p := 3.0ft	(User Input)
Thickness of Footing =	T _f := 3.5ft	(User Input)
Width of Footing =	W _f := 8-ft	(User Input)

Material Properties:

Internal Friction Angle of Soil =	Φ _s := 30-deg	(User Input)	
Allowable Soil Bearing Capacity =	q _s := 4500-psf	(User Input)	
Unit Weight of Soil =	γ _{soil} := 120-pcf	(User Input)	
Unit Weight of Concrete =	γ _{conc} := 150-pcf	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	n := 0-ft	(User Input)	
Cohesion of Clay Type Soil =	c := 0-ksf	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	z := ~	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	μ := 0.45	(User Input)	

Proposed Concrete Mat Properties:

Triangle One Width =	$T1_w := 26.10\text{ft}$	(User Input)
Triangle One Height =	$T1_h := 24.05\text{ft}$	(User Input)
Triangle Two Width =	$T2_w := 17.74\text{ft}$	(User Input)
Triangle Two Height =	$T2_h := 15.84\text{ft}$	(User Input)
Triangle Three Width =	$T3_w := 7.03\text{ft}$	(User Input)
Triangle Three Height =	$T3_h := 6.35\text{ft}$	(User Input)
Triangle Four Width =	$T4_w := 1.63\text{ft}$	(User Input)
Triangle Four Height =	$T4_h := 3.0\text{ft}$	(User Input)
Triangle Five Width =	$T5_w := 7.34\text{ft}$	(User Input)
Triangle Five Height =	$T5_h := 6.76\text{ft}$	(User Input)
Triangle Six Width =	$T6_w := 3.0\text{ft}$	(User Input)
Triangle Six Height =	$T6_h := 2.76\text{ft}$	(User Input)
Thickness of Mat =	$Mat_t := 8\text{ft}$	(User Input)
<u>Distance To Centroids:</u>	$d_1 := 25.25\text{ft}$	(User Input)
	$d_2 := 12.02\text{ft}$	(User Input)
	$d_3 := 5.47\text{ft}$	(User Input)



Subject:

Lattice Tower Pad and Pier Foundation
 Check

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Overturning Moment Check:

Adjusted Concrete Unit Weight =

$$\gamma_c := \text{if}(\text{Bouyancy} = 1, \gamma_{\text{conc}} - 62.4 \text{pcf}, \gamma_{\text{conc}}) = 150 \text{pcf}$$

Adjusted Soil Unit Weight =

$$\gamma_s := \text{if}(\text{Bouyancy} = 1, \gamma_{\text{soil}} - 62.4 \text{pcf}, \gamma_{\text{soil}}) = 120 \text{pcf}$$

Cross Sectional Area 1 of Resisting Pyramid =

$$B_1 := W_f^2 = 64 \text{ft}^2$$

Cross Sectional Area 2 of Resisting Pyramid =

$$B_2 := [2(L_p - L_{\text{pag}} - n) \cdot \tan(\Phi_s) + W_f]^2 = 277.6 \text{ft}^2$$

Volume of Concrete Pad and Pier =

$$V_{\text{pp}} := \left[(W_f^2 \cdot T_f) + \frac{d_p^2 \cdot \pi}{4} L_p \right] = 291.2 \text{ft}^3$$

Volume of Soil =

$$V_{\text{soil}} := \left[\frac{(L_p - L_{\text{pag}} - n)}{3} \cdot (B_1 + B_2 + \sqrt{B_1 \cdot B_2}) \right] \cdot \frac{3}{4} - \frac{d_p^2 \cdot \pi}{4} (L_p - L_{\text{pag}}) = 837 \text{ft}^3$$

Note: 3/4 reduction taken for amount soil used due to the concrete
 put in place for the mat.

Weight of Soil =

$$WT_s := V_{\text{soil}} \cdot \gamma_s = 100.5 \text{kip}$$

Total Volume of the Concrete Mat =

$$V_{\text{mat.tot}} := \frac{1}{2} \cdot \left[(W_f^2 \cdot T_f) + \left((L_p - L_{\text{pag}} - n) \cdot \tan(\Phi_s) + W_f \right)^2 \cdot L_p \right] = 353.1 \text{ft}^3$$

Weight of Concrete Mat =

$$WT_{\text{mat.tot}} := V_{\text{mat.tot}} \cdot \gamma_c = 353.1 \text{kips}$$

Weight of Concrete Pad and Pier =

$$WT_{\text{pp}} := V_{\text{pp}} \cdot \gamma_c = 43.7 \text{kips}$$

Overturning Moment =

$$M_{\text{ot}} := \text{Moment} + \text{Shear}_{\text{tot}} (L_p + T_f) = 3983 \text{kip-ft}$$

Resisting Moment =

$$M_r := (WT_{\text{pp}} + WT_s) \cdot d_1 + (WT_{\text{pp}} + WT_s) \cdot d_2 + WT_{\text{mat.tot}} \cdot d_2 = 9460.7 \text{ft-kips}$$

Factor of Safety =

$$\frac{M_r}{M_{\text{ot}}} = 2.38$$

$$\text{Overturning_Moment} := \text{if} \left(\frac{M_r}{M_{\text{ot}}} > 2, \text{"OK"}, \text{"NG"} \right)$$

Overturning_Moment = "OK"

Subject:

Lattice Tower Pad and Pier Foundation
 Check

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Bearing Pressure:

Cross Sectional Area of Base =

$$A_{mat} := \frac{1}{2} \cdot [T1_w \cdot T1_h - (T3_w \cdot T3_h) \cdot 2 - T5_w \cdot T5_h] = 244.4 \text{ ft}^2$$

Cross Sectional Area of Base =

$$A := A_{pad} \cdot 3 + A_{mat} = 436.403 \text{ ft}^2$$

Section Modulus of Foundation =

$$S := \frac{A_{pad} \cdot d_1^2 + A_{pad} \cdot d_3^2 \cdot 2 + A_{mat} \cdot d_2^2}{d_2} = 6651 \cdot \text{ft}^3$$

Total Weight =

$$P := (WT_{pp} + WT_{soil}) \cdot 3 + WT_{mat.tot} = 599.4 \cdot \text{kips}$$

Max Pressure =

$$q_{max} := \frac{P}{A} + \frac{M_{ot}}{S} = 1.97 \cdot \text{ksf}$$

$$\text{Max_Pressure_Check} := \text{if}(q_{max} < q_s, \text{"OK"}, \text{"NG"})$$

$$\text{Max_Pressure_Check} = \text{"OK"}$$

Minimum Pressure in Mat =

$$P_{min} := \frac{P}{A} - \frac{M_{ot}}{S} = 0.775 \cdot \text{ksf}$$

$$\text{Min_Pressure_Check} := \text{if}((P_{min} \geq 0) \cdot (P_{min} < q_s), \text{"Okay"}, \text{"No Good"})$$

$$\text{Min_Pressure_Check} = \text{"Okay"}$$

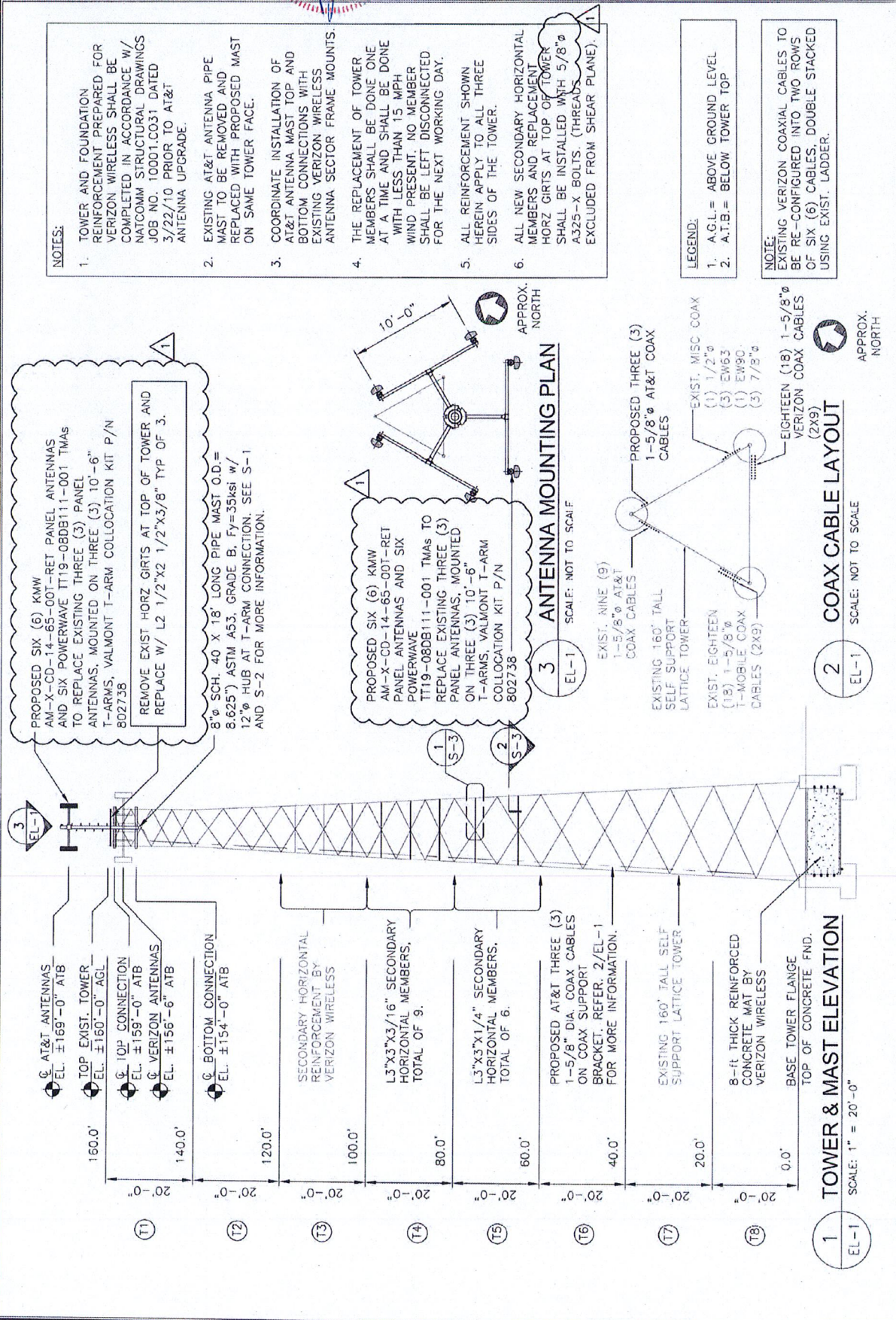
Concrete Mat Reinforcement:

Note: Reinforcement calculation for mat based on temperature and shrinkage steel requirements.
 Top and bottom reinforcement combined to account for required amount

Reinforcement =

$$\text{Reinf} := .0018 \cdot \text{Mat}_t \cdot 1\text{-ft} = 2.07 \cdot \text{in}^2$$

$$\text{Use \#8 bars @ 9" O.C.}$$



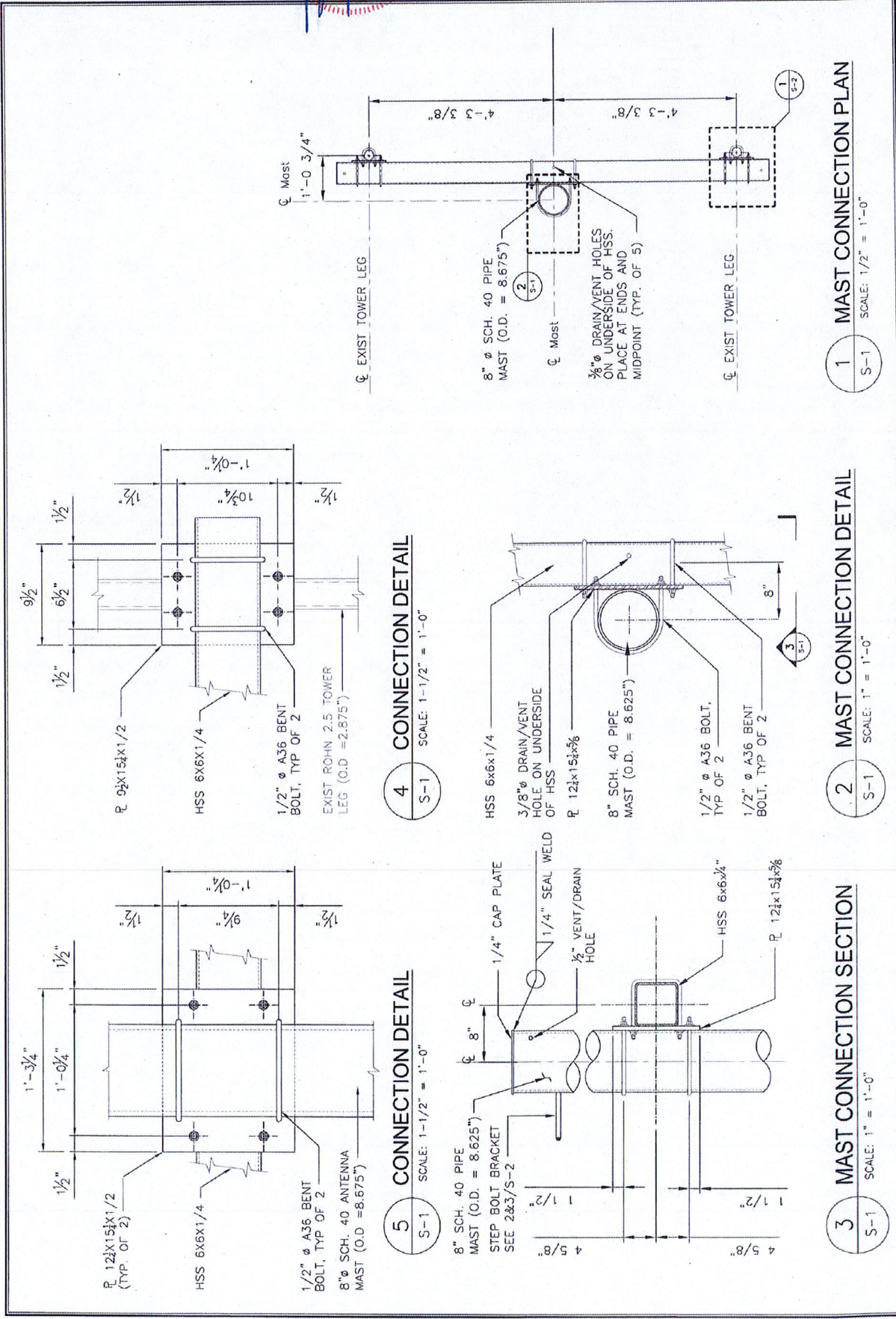
DESIGNED BY: JMA
 DRAWN BY: JMA
 CHECK BY: CFC

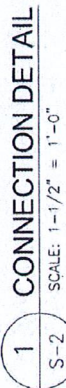
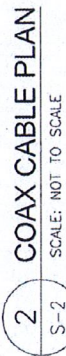
PROFESSIONAL ENGINEER
 STATE OF CALIFORNIA
 LICENSE NO. 10079-001

160-H SELF SUPPORT TOWER
 ANTENNA MAST INSTALLATION
 CTT1144
 DATE: 03/24/10
 SCALE: AS SHOWN
 JOB NO. 10079-001

MAST CONNECTION DETAILS

SHEET NO. **S-1**





CELESTRA Communications Building 10000 N. 10th St. Phoenix, Arizona 85018 Tel: (602) 998-1100 Fax: (602) 998-1101 E-Mail: info@celestrak.com Web: www.celestrak.com		ANTENNA MAST INSTALLATION 160' SELF SUPPORT TOWER CT1144 PROJECT WAS NOT COMMENCED YET ANTENNA MAST LTD. 0905 MASTCON CT. 0905	
DATE:	06/24/10	SCALE:	AS SHOWN
JOH NO.	10079.001		

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

A. STRUCTURAL STEEL (W SHAPES)-----AS

- | | | |
|----|--|----------------------------------|
| A. | STRUCTURAL STEEL (W SHAPES)--- | ASTM A592, (FY = 50 KSI) |
| B. | STRUCTURAL STEEL (OTHER SHAPES)--- | ASTM A36, (FY = 36 KSI) |
| C. | STRUCTURAL HSS (RECTANGULAR SHAPES)--- | ASTM A500 GRADE B, (FY = 46 KSI) |
| D. | STRUCTURAL HSS (ROUND SHAPES)--- | ASTM A500 GRADE B, (FY = 42 KSI) |
| E. | PIPE--- | ASTM A53 (FY = 35 KSI) |
| F. | CONNECTION BOLTS--- | ASTM A325-N |
| G. | U-BOLTS--- | ASTM A36 |
| H. | ANCHOR RODS--- | ASTM F 1554 |
| I. | WELDING ELECTRODE--- | ASTM F 70XX |

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES, INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, WELDED JOINTS AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
FIFTEEN PERCENT SHOP ASSEMBLY FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

- AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE"

CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD

- CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FITTET WELD SIZES ARE NOT SHOWN. PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" (9TH EDITION, AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

2. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

[illegible]

PAINT NOTES CONTINUED

13. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
14. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
15. CONNECTIONS SHALL CONFORM TO ALL REQUIREMENTS OF THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR SHELTERS", LATEST EDITION, AND THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", LATEST EDITION.
16. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
19. FABRICATE BEAMS WITH MILL CAMBER UP.
20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
22. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
23. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.

7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH-PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT

1. FERROUS METAL:
 - A. CLEAN SURFACE IN CONFORMANCE TO SSPC-SP-3 STANDARDS, POWER TOOL CLEANING.
 - PRIMER: APPLY ONE SPOT COAT OF TENEMEC SERIES 1 PRIMER @ 2.5-3.0 MILS DRY.
 - FINISH COAT: APPLY TWO SPOT COATS OF TENEMEC SERIES 1029 (COLOR) AT 2.5 MILS PER COAT.COLOR TO MATCH EXISTING BUILDING COLOR. OWNER TO APPROVE COLOR MATCH.
2. ZINC COATED METAL: PROVIDE THE FOLLOWING FINISH SYSTEM OVER ZINC COATED METAL:
 - A. SEMIGLOSS ACRYLIC-ENAMEL FINISH: 2 FINISH COATS OVER A PRIMER.
 - PRIMER: GALVANIZED METAL PRIMER APPLIED AT SPREADING RATE RECOMMENDED BY THE MANUFACTURER TO ACHIEVE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 1.2 MILS. BENJAMIN MOOR IRON CLAD GALVANIZED METAL LATEX PRIMER #155 OR APPROVED EQUAL.

PAINT NOTES CONTINUED

PAINTING SCHEDULE:

FIRST AND SECOND COAT: SEMIGLOSS, ACYCLIC EXTERIOR ENAMEL APPLIED AT

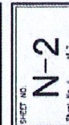
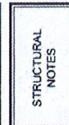
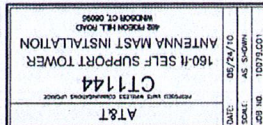
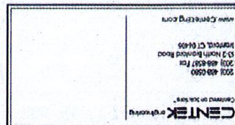
3. COAXIAL CABLES:
- A. ONE COAT OF DTM BONDING PRIMER (2-5 MILS. DRY FINISH)
- B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5-5 MILS. DRY FINISH)
- C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI-SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE: SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH-PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATINGS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.

9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON-PETROLEUM-BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

REV	DATE	BY	DESCRIPTION
1	08/30/10	JSM	REVISED BOLT AND TOP ORIF SIZE
0	6/25/10	JSM	ISSUED FOR CONSTRUCTION
0			ISSUED BY



Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
Checked by: C.F.C.

**Development of Design Heights, Exposure Coefficients,
and Velocity Pressures Per TIA/EIA**

Wind Speeds

Basic Wind Speed
Basic Wind Speed with Ice

$V_{AAA} := 80$
 $V := 69$

mph
mph

(User Input per NU Mast Design Criteria Exception 1)
(User Input per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Mast
Antenna
TMA
Mount
Coax Cable

$z_{mast} := 162.0$
 $z_{ant} := 169$
 $z_{TMA} := 169$
 $z_{mnt} := 169$
 $z_{coax} := 162.0$

ft
ft
ft
ft
ft

(User Input)
(User Input)
(User Input)
(User Input)
(User Input)

Exposure Coefficients, k_z

(per TIA/EIA-222-F Section 2.3.3)

Mast

$$Kz_{mast} := \left(\frac{z_{mast}}{33} \right)^{\frac{2}{7}} = 1.576$$

Antenna

$$Kz_{ant} := \left(\frac{z_{ant}}{33} \right)^{\frac{2}{7}} = 1.595$$

TMA

$$Kz_{TMA} := \left(\frac{z_{TMA}}{33} \right)^{\frac{2}{7}} = 1.595$$

Mount

$$Kz_{mnt} := \left(\frac{z_{mnt}}{33} \right)^{\frac{2}{7}} = 1.595$$

Coax Cable

$$Kz_{coax} := \left(\frac{z_{coax}}{33} \right)^{\frac{2}{7}} = 1.576$$

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Velocity Pressure without ice, q_z

(per TIA/EIA-222-F Section 2.3.3)

Mast	$q_{z_{mast}} := 0.00256 \cdot K_{z_{mast}} \cdot V^2 = 25.814$
Antenna	$q_{z_{ant}} := 0.00256 \cdot K_{z_{ant}} \cdot V^2 = 26.128$
TMA	$q_{z_{TMA}} := 0.00256 \cdot K_{z_{TMA}} \cdot V^2 = 26.128$
Mount	$q_{z_{mnt}} := 0.00256 \cdot K_{z_{mnt}} \cdot V^2 = 26.128$
Coax Cable	$q_{z_{coax}} := 0.00256 \cdot K_{z_{coax}} \cdot V^2 = 25.814$

Velocity Pressure with ice, q_{zICE}

(per TIA/EIA-222-F Section 2.3.3)

Mast	$q_{zICE_{mast}} := 0.00256 \cdot K_{z_{mast}} \cdot V_i^2 = 19.203$
Antenna	$q_{zICE_{ant}} := 0.00256 \cdot K_{z_{ant}} \cdot V_i^2 = 19.436$
TMA	$q_{zICE_{TMA}} := 0.00256 \cdot K_{z_{TMA}} \cdot V_i^2 = 19.436$
Mount	$q_{zICE_{mnt}} := 0.00256 \cdot K_{z_{mnt}} \cdot V_i^2 = 19.436$
Coax Cable	$q_{zICE_{coax}} := 0.00256 \cdot K_{z_{coax}} \cdot V_i^2 = 19.203$

TIA/EIA Common Factors:

Gust Response Factor =	$G_H := 1.69$	(User Input per TIA/EIA-222-F Section 2.3.4)
Gust Response Factor Multiplier =	$m_w := 1.25$	(User Input per TIA/EIA-222-F Section 2.3.4.4)
Radial Ice Thickness =	$I_r := 0.50$ in	(User Input per TIA/EIA-222-F Section 2.3.1)
Radial Ice Density =	$I_d := 56.00$ pcf	(User Input)

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Development of Wind & Ice Load on PCS Mast

(per TIA/EIA-222-F-1996 Criteria)

Mast Data:

(Pipe 8" SCH. 40)

(User Input)

Mast Shape =

Round

(User Input)

Mast Diameter =

$D_{mast} := 8.625$ in

(User Input)

Mast Length =

$L_{mast} := 17$ ft

(User Input)

Mast Thickness =

$t_{mast} := 0.322$ in

(User Input)

Mast Aspect Ratio =

$$Ar_{mast} := \frac{12L_{mast}}{D_{mast}} = 23.7$$

Mast Force Coefficient =

$Ca_{mast} = 1.17$

(per TIA/EIA-222-F Table 3)

Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area =

$$A_{mast} := \frac{D_{mast}}{12} = 0.719$$

Total Mast Wind Force =

$$qz_{mast} G_H Ca_{mast} A_{mast} = 37$$

plf **BLC 5,7**

Wind Load (with ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Mast Projected Surface Area w/ Ice =

$$A_{ICE_{mast}} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.802$$

Total Mast Wind Force w/ Ice =

$$qz_{ICE_{mast}} G_H Ca_{mast} A_{ICE_{mast}} = 30$$

plf **BLC 4,6**

Gravity Loads (without ice)

Weight of the mast =

Self Weight

(Computed internally by Risa-3D)

plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot =

$$A_{i_{mast}} := \frac{\pi}{4} [(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2] = 14.3$$

sq in

Weight of Ice on Mast =

$$W_{ICE_{mast}} := Id \cdot \frac{A_{i_{mast}}}{144} = 6$$

plf **BLC 3**

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

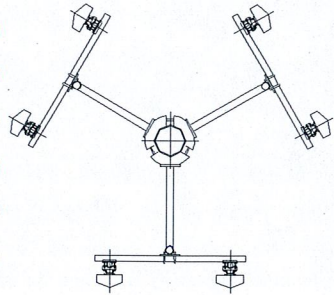
Prepared by: J.R.M.
Checked by: C.F.C.

Development of Wind & Ice Load on Antennas

(per TIA/EIA-222-F-1996 Criteria)

Antenna Data:

Antenna Model = KMW-AM-X-CD-14-65-00T-RET
Antenna Shape = Flat (User Input)
Antenna Height = $L_{ant} := 48$ in (User Input)
Antenna Width = $W_{ant} := 11.8$ in (User Input)
Antenna Thickness = $T_{ant} := 5.9$ in (User Input)
Antenna Weight = $WT_{ant} := 36.4$ lbs (User Input)
Number of Antennas = $N_{ant} := 6$ (User Input)
Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.1$
Antenna Force Coefficient = $Ca_{ant} := 1.4$ (per TIA/EIA-222-F-1996 Table 3)



Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $A_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = \dots$ sf
Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 23.6$ sf

Total Antenna Wind Force =

$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1459$ lbs **BLC 5,7**

Wind Load (with ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.4$ sf
Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 26.1$ sf

Total Antenna Wind Force w/ Ice =

$F_{ant} := qz_{ICEant} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1202$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =

$WT_{ant} \cdot N_{ant} = 218$ lbs **BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3342$ cu in
Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1) \cdot (W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 986$ cu in
Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 32$ lbs
Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 192$ lbs **BLC 3**

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

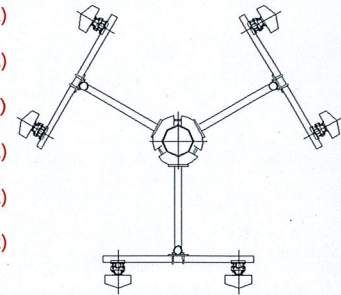
Prepared by: J.R.M.
Checked by: C.F.C.

Development of Wind & Ice Load on TMA's

(per TIA/EIA-222-F-1996 Criteria)

TMA Data:

TMA Model =	Powerwave TT19-08DB111-01
TMA Shape =	Flat (User Input)
TMA Height =	$L_{TMA} := 9.9$ in (User Input)
TMA Width =	$W_{TMA} := 6.7$ in (User Input)
TMA Thickness =	$T_{TMA} := 5.4$ in (User Input)
TMA Weight =	$W_{TMA} := 16$ lbs (User Input)
Number of TMA's =	$N_{TMA} := 6$ (User Input)
TMA Aspect Ratio =	$A_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.5$
TMA Force Coefficient =	$Ca_{TMA} = 1.4$ (per TIA/EIA-222-F Table 3)



Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA =	$A_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} =$	sf
TMA Projected Surface Area =	$A_{TMA} := SA_{TMA} \cdot N_{TMA} = 2.8$	sf

Total TMA Wind Force =

$$F_{TMA} := qz_{TMA} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 171 \text{ lbs} \quad \text{BLC 5,7}$$

Wind Load (with ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to All TMA's Simultaneously

Surface Area for One TMA w/ Ice =	$SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.6$	sf
TMA Projected Surface Area w/ Ice =	$A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 3.5$	sf

Total TMA Wind Force w/ Ice =

$$F_{ITMA} := qz_{ICE} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 161 \text{ lbs} \quad \text{BLC 4,6}$$

Gravity Load (without ice)

Weight of All TMA's =

$$W_{TMA} \cdot N_{TMA} = 96 \text{ lbs} \quad \text{BLC 2}$$

Gravity Load (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 358$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 1) \cdot (W_{TMA} + 1) \cdot (T_{TMA} + 1) - V_{TMA} = 179$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 6$	lbs

Weight of Ice on All TMA's

$$W_{ICETMA} \cdot N_{TMA} = 35 \text{ lbs} \quad \text{BLC 3}$$

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Development of Wind & Ice Load on Antenna Mounts

(per TIA/EIA-222-F-1996 Criteria)

Mount Data:

Mount Type:

Valmont 10'-6" T-Arm Co-Location Kit

Mount Shape =

(User Input)

Mount Projected Surface Area =

CaAa := 23.45 sf (User Input)

Mount Projected Surface Area w/ Ice =

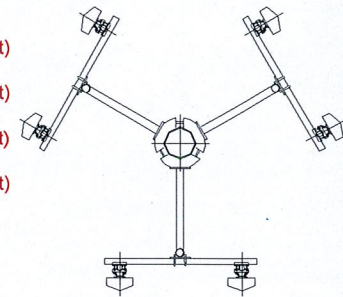
CaAa_{ice} := 31.40 sf (User Input)

Mount Weight =

WT_{mnt} := 585 lbs (User Input)

Mount Weight w/ Ice =

WT_{mnt.ice} := 765 lbs



Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Total Mount Wind Force =

$F_{mnt} := qz_{mnt} \cdot G_H \cdot CaAa = 1035$ lbs **BLC 5,7**

Wind Load (with ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Total Mount Wind Force =

$F_{i,mnt} := qz_{ice} \cdot G_H \cdot CaAa_{ice} = 1031$ lbs **BLC 4,6**

Gravity Loads (without ice)

(per TIA/EIA-222-F-1996)

Weight of All Mounts =

WT_{mnt} = 585 lbs **BLC 2**

Gravity Loads (ice only)

(per TIA/EIA-222-F-1996)

Weight of Ice on All Mounts =

WT_{mnt.ice} - WT_{mnt} = 180 lbs **BLC 3**

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

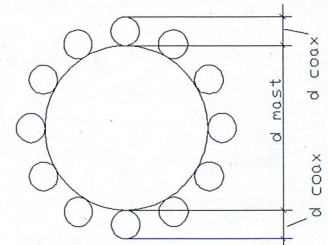
Development of Wind & Ice Load on Coax Cables

per TIA/EIA-222-F-96 Criteria

Coax Cable Data:

Coax Type =
 Shape =
 Coax Outside Diameter =
 Coax Cable Length =
 Weight of Coax per foot =
 Total Number of Coax =
 No. of Coax Projecting Outside Face of PCS Mast =

HELIAX 1-5/8"
 Round (User Input)
 $D_{\text{coax}} := 1.98$ in (User Input)
 $L_{\text{coax}} := 10$ ft (User Input)
 $Wt_{\text{coax}} := 1.04$ plf (User Input)
 $N_{\text{coax}} := 12$ (User Input)
 $NP_{\text{coax}} := 2$ (User Input)



Coax aspect ratio,

$$Ar_{\text{coax}} := \frac{(L_{\text{coax}} \cdot 12)}{D_{\text{coax}}} = 60.6$$

Coax Cable Force Factor Coefficient =

$Ca_{\text{coax}} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice)

per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area =

$$A_{\text{coax}} := \frac{(NP_{\text{coax}} D_{\text{coax}})}{12} = 0.3 \text{ ft}$$

Total Coax Wind Force =

$$F_{\text{coax}} := Ca_{\text{coax}} qz_{\text{coax}} G_H A_{\text{coax}} = 17 \text{ plf} \quad \text{BLC 5,7}$$

Wind Load (with ice)

per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area w/ Ice =

$$A_{\text{ICE}_{\text{coax}}} := \frac{(NP_{\text{coax}} D_{\text{coax}} + 2 \cdot Ir)}{12} = 0.4 \text{ ft}$$

Total Coax Wind Force w/ Ice =

$$F_{\text{ICE}_{\text{coax}}} := Ca_{\text{coax}} qz_{\text{ICE}_{\text{coax}}} G_H A_{\text{ICE}_{\text{coax}}} = 16 \text{ plf} \quad \text{BLC 4,6}$$

Gravity Loads (without ice)

Weight of all cables w/o ice

$$WT_{\text{coax}} := Wt_{\text{coax}} N_{\text{coax}} = 12 \text{ plf} \quad \text{BLC 2}$$

Gravity Loads (ice only)

Ice Area per Linear Foot =

$$A_{\text{ICE}_{\text{coax}}} := \frac{\pi}{4} [(D_{\text{coax}} + 2 \cdot Ir)^2 - D_{\text{coax}}^2] = 3.9 \text{ sq in}$$

Ice Weight All Coax per foot =

$$WT_{\text{ICE}_{\text{coax}}} := N_{\text{coax}} \cdot Id \cdot \frac{A_{\text{ICE}_{\text{coax}}}}{144} = 18 \text{ plf} \quad \text{BLC 3}$$

Subject:

Load Analysis of Pipe Mast and AT&T Equipment

Location:

Windsor, CT

Rev. 2: 08/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.

Development of Wind & Ice Load on Brace Member

(per TIA/EIA-222-F-1996 Criteria)

Member Data:

HSS 6x6x1/4

Antenna Shape =

Flat (User Input)

Height =

$H_{mem} := 6$ in (User Input)

Width =

$W_{mem} := 6$ in (User Input)

Length =

$L_{mem} := 60$ in (User Input)

Member Aspect Ratio =

$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 10.0$

Member Force Coefficient =

$Ca_{mem} = 1.5$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area =

$A_{mem} := \frac{H_{mem}}{12} = 0.5$ plf

Total Member Wind Force =

$F_{mem} := qz_{mast} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 33$ lbs **BLC 5, 7**

Wind Load (with ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice =

$A_{ICEmem} := \frac{(A_{mem} + A_{ice})}{12} = 0.6$ plf

Total Member Wind Force w/ Ice =

$F_{mem} := qz_{ICEant} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 29$ lbs **BLC 4, 6**

Gravity Load (without ice)

Weight of Member =

Self Weight lbs **BLC 1**

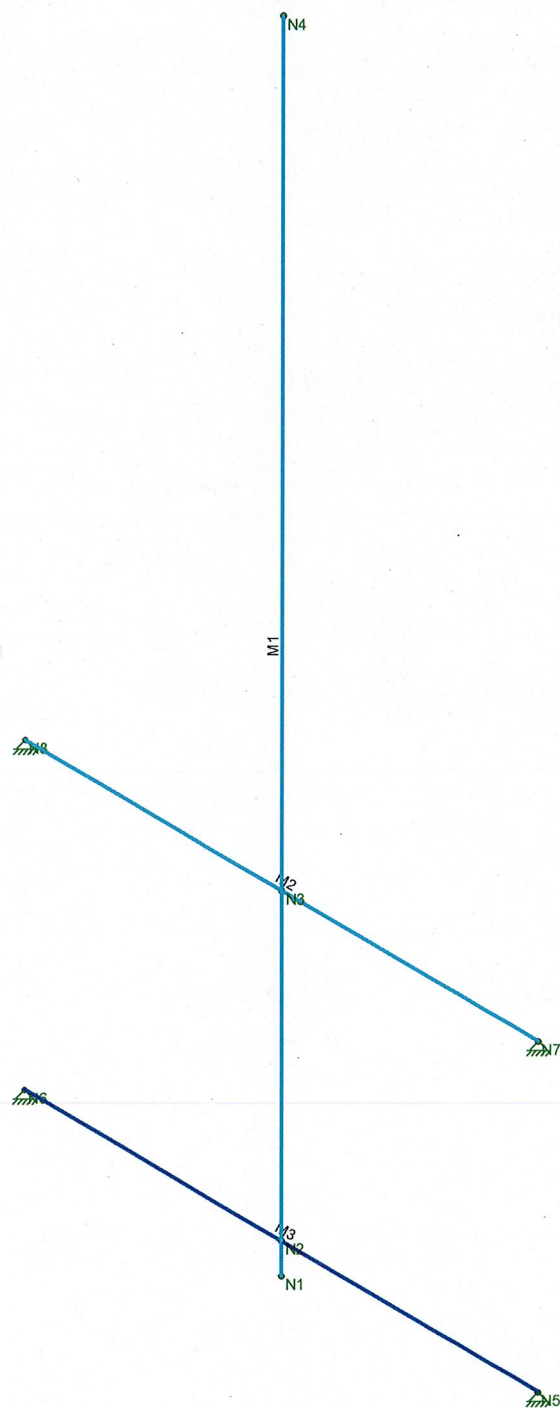
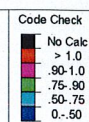
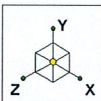
Gravity Loads (ice only)

Ice Area per Linear foot =

$A_{mem} := (W_{mem} + 2 \cdot Ir) \cdot (H_{mem} + 2 \cdot Ir) - W_{mem} \cdot H_{mem} = 13$ sq in

Weight of Ice on Member =

$W_{ICE,mem} := Id \cdot \frac{A_{mem}}{144} = 5$ lbs **BLC 3**



Solution: Envelope
Z-moment Reaction units are k and k-ft

CEN TEK Engineering, INC.

jrm, cfc

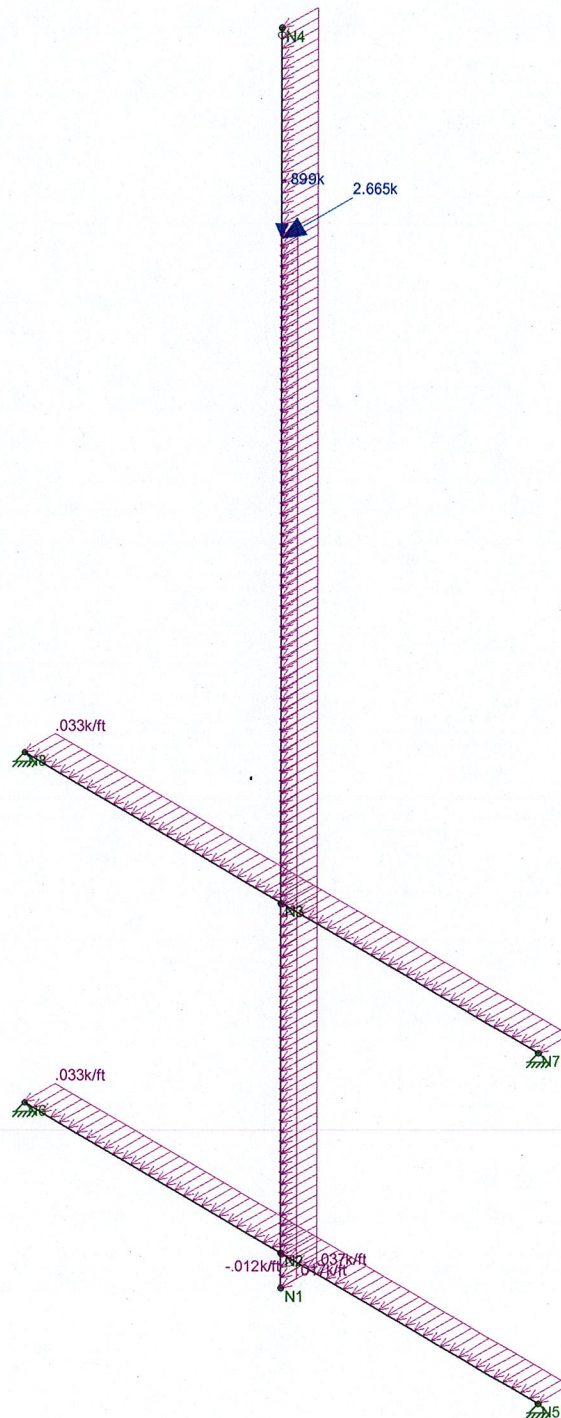
10079.CO1 ~ Rev 2

AT&T Pipe Mast Design
Unity Bending

SK - 5

Aug 20, 2010 at 6:55 AM

EIA-TIA.r3d



Loads: LC 4, z-dir TIA/EIA Wind on PCS Structure
Results for LC 4, z-dir TIA/EIA Wind on PCS Structure

CEN TEK Engineering, INC.

jrm, cfc

10079.CO1 ~ Rev 2

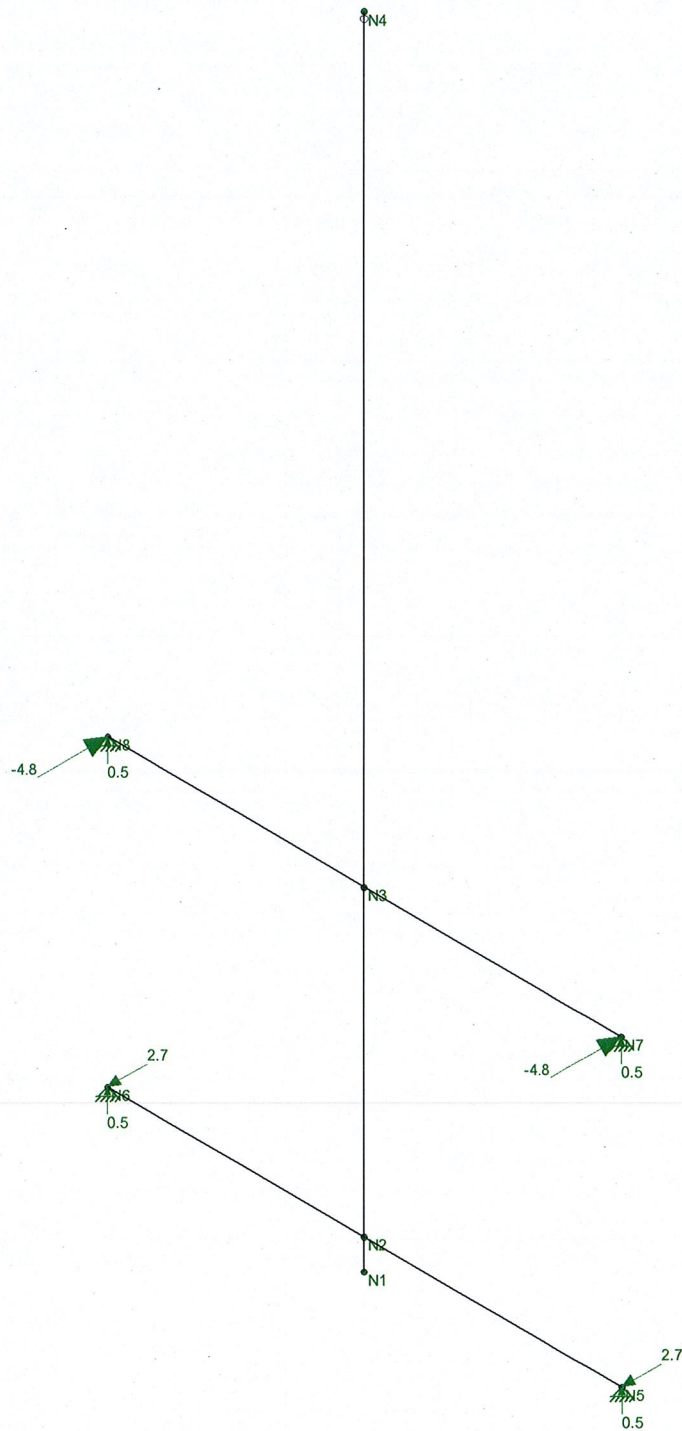
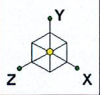
AT&T Pipe Mast Design

LC #4 Loads

SK - 3

Aug 20, 2010 at 6:53 AM

EIA-TIA.r3d



Results for LC 4, z-dir TIA/EIA Wind on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.

jrm, cfc

10079.CO1 ~ Rev 2

AT&T Pipe Mast Design
LC #4 Graphic Reactions

SK - 4

Aug 20, 2010 at 6:54 AM

EIA-TIA.r3d

Company : CENTEK Engineering, INC.
 Designer : jrm, cfc
 Job Number : 10079.CO1 ~ Rev 2

AT&T Pipe Mast Design

Aug 20, 2010
 6:56 AM
 Checked By: _____

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
Wood Code	NDS 91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 2002
Masonry Code	MSJC 05/IBC 06 ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]
1	gen Conc3NW	3155	1372	.15	.6	.145
2	gen Conc4NW	3644	1584	.15	.6	.145
3	gen Conc3LW	2085	906	.15	.6	.11
4	gen Conc4LW	2408	1047	.15	.6	.11
5	gen Alum	10600	4077	.3	1.29	.173
6	gen Steel	29000	11154	.3	.65	.49
7	RIGID	1e+7		0	0	0

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]	Yield[ksi]
1	A36 Gr.36	29000	11154	.3	.65	.49	36
2	A572 Gr.50	29000	11154	.3	.65	.49	50
3	A992	29000	11154	.3	.65	.49	50
4	A500 Gr.42	29000	11154	.3	.65	.49	42
5	A500 Gr.46	29000	11154	.3	.65	.49	46
6	A53 Gr. B	29000	11154	.3	.65	.49	35

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Company : CENTEK Engineering, INC.
 Designer : jrm, cfc
 Job Number : 10079.CO1 ~ Rev 2

AT&T Pipe Mast Design

Aug 20, 2010
 6:56 AM
 Checked By: _____

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE 8.0	Beam	Pipe	A53 Gr. B	Typical	7.85	68.1	68.1	136
2	Horz Brace	HSS6X6X4	Beam	Tube	A500 Gr.46	Typical	5.225	28.569	28.569	45.507

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N4			Mast	Beam	Pipe	A53 Gr. B	Typical
2	M2	N8	N7			Horz Brace	Beam	Tube	A500 Gr.46	Typical
3	M3	N6	N5			Horz Brace	Beam	Tube	A500 Gr.46	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	TOM	Inactive
1	M1		BenPIN				Yes		
2	M2						Yes		
3	M3						Yes		

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	.5	0	0	
3	N3	0	5.5	0	0	
4	N4	0	18	0	0	
5	N5	4.28	.5	0	0	
6	N6	-4.28	.5	0	0	
7	N7	4.28	5.5	0	0	
8	N8	-4.28	5.5	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N8	Reaction	Reaction	Reaction				
2	N7	Reaction	Reaction	Reaction				
3	N6	Reaction	Reaction	Reaction				
4	N5	Reaction	Reaction	Reaction				

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M1	Mast	18	Segment		Segment								Lateral
2	M2	Horz Brace	8.56											Lateral
3	M3	Horz Brace	8.56											Lateral

Design Size and Code Check Parameters

	Label	Max Depth[in]	Min Depth[in]	Max Width[in]	Min Width[in]	Max Bending Chk	Max Shear Chk
1	Typical					1	1

No Data to Print ...

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.218	15
2	M1	Y	-.096	15
3	M1	Y	-.585	15

Member Point Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.192	15
2	M1	Y	-.035	15
3	M1	Y	-.18	15

Member Point Loads (BLC 4 : x-dir TIA/EIA Wind with Ice on P)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.202	15
2	M1	X	.161	15
3	M1	X	1.031	15

Member Point Loads (BLC 5 : x-dir TIA/EIA Wind on PCS Struct)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.459	15
2	M1	X	.171	15
3	M1	X	1.035	15

Member Point Loads (BLC 6 : z-dir TIA/EIA Wind with Ice on P)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	1.202	15
2	M1	Z	.161	15
3	M1	Z	1.031	15

Member Point Loads (BLC 7 : z-dir TIA/EIA Wind on PCS Struct)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	1.459	15
2	M1	Z	.171	15
3	M1	Z	1.035	15

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.012	-.012	0	15

Member Distributed Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.006	-.006	0	0
2	M1	Y	-.018	-.018	0	15
3	M2	Y	-.005	-.005	0	0
4	M3	Y	-.005	-.005	0	0

Member Distributed Loads (BLC 4 : x-dir TIA/EIA Wind with Ice on P)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.03	.03	0	0
2	M1	X	.016	.016	0	15

Member Distributed Loads (BLC 5 : x-dir TIA/EIA Wind on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.037	.037	0	0
2	M1	X	.017	.017	0	15

Member Distributed Loads (BLC 6 : z-dir TIA/EIA Wind with Ice on P)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.03	.03	0	0
2	M1	Z	.016	.016	0	15
3	M2	Z	.029	.029	0	0
4	M3	Z	.029	.029	0	0

Member Distributed Loads (BLC 7 : z-dir TIA/EIA Wind on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,d...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.037	.037	0	0
2	M1	Z	.017	.017	0	15
3	M2	Z	.033	.033	0	0
4	M3	Z	.033	.033	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area (...Surfa...
1	Self Weight (PCS Mast)	None		-1					
2	Weight of Appurtenances	None					3	1	
3	Weight of Ice Only on PCS Struct	None					3	4	
4	x-dir TIA/EIA Wind with Ice on P	None					3	2	
5	x-dir TIA/EIA Wind on PCS Struct	None					3	2	
6	z-dir TIA/EIA Wind with Ice on P	None					3	4	
7	z-dir TIA/EIA Wind on PCS Struct	None					3	4	

Load Combinations

	Description	Sol...PD..SR...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...
1	x-dir TIA/EIA Wind + Ice on PCS S...	Yes	1	1	2	1	3	1	4	1
2	x-dir TIA/EIA Wind on PCS Structu...	Yes	1	1	2	1	5	1		
3	z-dir TIA/EIA Wind + Ice on PCS S...	Yes	1	1	2	1	3	1	6	1
4	z-dir TIA/EIA Wind on PCS Structu...	Yes	1	1	2	1	7	1		
5	Self Weight									

Load Combination Design

	Description	ASIF	CD	ABIF	Service	Hot Roll...	Cold Fo...	Wood	Concrete	Masonry	Footings
1	x-dir TIA/EIA Wind + Ice on PCS Stru...	1.333				Yes	Yes	Yes	Yes	Yes	Yes
2	x-dir TIA/EIA Wind on PCS Structure	1.333				Yes	Yes	Yes	Yes	Yes	Yes
3	z-dir TIA/EIA Wind + Ice on PCS Str...	1.333				Yes	Yes	Yes	Yes	Yes	Yes
4	z-dir TIA/EIA Wind on PCS Structure	1.333				Yes	Yes	Yes	Yes	Yes	Yes
5	Self Weight					Yes	Yes	Yes	Yes	Yes	Yes

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...]	LC	Y Rotation [...]	LC	Z Rotation [...]	LC
1	N1	max	.002	2	-.025	2	0	1	5.366e-3	4	0	1	4.113e-4	2
2		min	0	3	-.036	1	-.186	4	0	1	0	4	0	3
3	N2	max	0	4	-.025	2	0	1	5.366e-3	4	0	1	4.112e-4	2
4		min	0	2	-.036	1	-.154	4	0	1	0	4	0	3
5	N3	max	.001	2	-.025	2	.265	4	1.061e-2	4	0	1	0	4
6		min	0	4	-.037	1	0	1	0	1	0	4	-1.755e-3	2
7	N4	max	1.373	2	-.025	2	2.965	4	0	1	0	1	0	1
8		min	0	4	-.037	1	0	1	0	1	0	4	0	1
9	N5	max	0	4	0	2	0	1	5.366e-3	4	0	1	1.033e-3	3
10		min	0	2	0	3	0	4	0	1	-4.333e-3	4	5.144e-4	2
11	N6	max	0	4	0	4	0	1	5.366e-3	4	4.333e-3	4	-6.991e-4	4
12		min	0	2	0	1	0	4	0	1	0	1	-1.198e-3	1
13	N7	max	0	2	0	4	0	4	1.061e-2	4	7.487e-3	4	1.742e-3	1
14		min	0	4	0	1	0	1	0	1	0	1	7.04e-4	4
15	N8	max	0	2	0	2	0	4	1.061e-2	4	0	1	8.386e-5	2
16		min	0	4	0	3	0	1	0	1	-7.487e-3	4	-1.04e-3	3

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	0	4	.686	3	0	1	0	1	0	1	0	1
2		min	-3.562	2	-1.13	2	-4.75	4	0	1	0	1	0	1
3	N7	max	0	4	2.109	1	0	1	0	1	0	1	0	1
4		min	-3.562	2	.468	4	-4.75	4	0	1	0	1	0	1
5	N6	max	1.769	2	1.015	1	2.675	4	0	1	0	1	0	1
6		min	0	4	.465	4	0	1	0	1	0	1	0	1
7	N5	max	1.769	2	.681	3	2.675	4	0	1	0	1	0	1
8		min	0	4	.09	2	0	1	0	1	0	1	0	1
9	Totals:	max	0	4	2.735	3	0	1						
10		min	-3.586	2	1.864	4	-4.151	4						

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
1	M1	1	max	0	1	0	1	0	1	0	1	0	1	0	1
2			min	0	1	0	1	0	1	0	1	0	1	0	1
3		2	max	.886	1	0	3	5.875	4	0	1	23.074	4	11.496	2
4			min	.603	2	-3.781	2	0	1	0	1	0	1	0	3
5		3	max	1.78	1	3.1	2	0	1	0	1	17.795	4	17.795	2
6			min	1.211	2	0	3	-3.1	4	0	1	0	1	0	3
7		4	max	1.498	1	2.857	2	0	1	0	1	4.391	4	4.391	2
8			min	1.037	2	0	3	-2.857	4	0	1	0	1	0	3
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	0	3	.686	3	0	1	0	1	0	1	0	1
12			min	-3.562	2	-1.13	2	-4.75	4	0	1	0	1	0	1
13		2	max	0	3	.637	3	0	1	0	1	0	1	2.458	2
14			min	-3.562	2	-1.168	2	-4.679	4	0	1	-10.09	4	-1.416	3
15		3	max	0	3	.588	3	0	1	0	1	0	1	-1.838	4
16			min	-3.562	2	-2.011	1	-4.609	4	0	1	-20.028	4	-8.817	1
17		4	max	3.562	2	-.43	4	4.679	4	0	1	0	1	-.96	4

Envelope Member Section Forces (Continued)

Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
18		min	0	3	-2.06	1	0	1	0	1	-10.09	4	-4.461	1
19	5	max	3.562	2	-.468	4	4.75	4	0	1	0	1	0	1
20		min	0	3	-2.109	1	0	1	0	1	0	1	0	1
21	M3	1	max	1.769	2	1.015	1	2.675	4	0	1	0	1	0
22		min	0	3	.465	4	0	1	0	1	0	1	0	1
23	2	max	1.769	2	.966	1	2.745	4	0	1	5.799	4	-.953	4
24		min	0	3	.426	4	0	1	0	1	0	1	-2.12	1
25	3	max	1.769	2	.918	1	2.816	4	0	1	11.75	4	-1.825	4
26		min	0	3	.388	4	-2.511	3	0	1	0	1	-4.136	1
27	4	max	0	3	-.052	2	0	1	0	1	5.799	4	-.152	2
28		min	-1.769	2	-.633	3	-2.745	4	0	1	0	1	-1.406	3
29	5	max	0	3	-.09	2	0	1	0	1	0	1	0	1
30		min	-1.769	2	-.681	3	-2.675	4	0	1	0	1	0	1

Envelope Member Section Stresses

Member	Sec		Axial[ksi]	LC	y Shear[...LC	z Shear[...LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	0	1	0	1	0	1	0	1	0	1	0
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	2	max	.113	1	0	3	1.497	4	0	3	8.736	2	17.534	4
4		min	.077	2	-.963	2	0	1	-8.736	2	0	3	0	1
5	3	max	.227	1	.79	2	0	1	0	3	13.522	2	13.522	4
6		min	.154	2	0	3	-.79	4	-13.522	2	0	3	0	1
7	4	max	.191	1	.728	2	0	1	0	3	3.337	2	3.337	4
8		min	.132	2	0	3	-.728	4	-3.337	2	0	3	0	1
9	5	max	0	1	0	1	0	1	0	1	0	1	0	1
10		min	0	1	0	1	0	1	0	1	0	1	0	1
11	M2	1	max	0	3	.246	3	0	1	0	1	0	1	0
12		min	-.682	2	-.405	2	-1.703	4	0	1	0	1	0	1
13	2	max	0	3	.228	3	0	1	1.784	3	3.097	2	0	1
14		min	-.682	2	-.418	2	-1.677	4	-3.097	2	-1.784	3	-12.714	4
15	3	max	0	3	.211	3	0	1	11.111	1	-2.317	4	0	1
16		min	-.682	2	-.721	1	-1.652	4	2.317	4	-11.111	1	-25.237	4
17	4	max	.682	2	-.154	4	1.677	4	5.621	1	-1.21	4	0	1
18		min	0	3	-.738	1	0	1	1.21	4	-5.621	1	-12.714	4
19	5	max	.682	2	-.168	4	1.703	4	0	1	0	1	0	1
20		min	0	3	-.756	1	0	1	0	1	0	1	0	1
21	M3	1	max	.339	2	.364	1	.959	4	0	1	0	1	0
22		min	0	3	.166	4	0	1	0	1	0	1	0	1
23	2	max	.339	2	.346	1	.984	4	2.672	1	-1.201	4	7.308	4
24		min	0	3	.153	4	0	1	1.201	4	-2.672	1	0	1
25	3	max	.339	2	.329	1	1.009	4	5.212	1	-2.3	4	14.806	4
26		min	0	3	.139	4	-.9	3	2.3	4	-5.212	1	0	1
27	4	max	0	3	-.019	2	0	1	1.772	3	-.192	2	7.308	4
28		min	-.339	2	-.227	3	-.984	4	.192	2	-1.772	3	0	1
29	5	max	0	3	-.032	2	0	1	0	1	0	1	0	1
30		min	-.339	2	-.244	3	-.959	4	0	1	0	1	0	1

Company : CENTEK Engineering, INC.
 Designer : jrm, cfc
 Job Number : 10079.CO1 ~ Rev 2

AT&T Pipe Mast Design

Aug 20, 2010
 6:56 AM

Checked By: _____

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	-0.25	2	0	3	0	1	0	1	NC	3	NC	1
2			min	-.036	1	-.002	2	-.186	4	0	1	NC	2	NC	4
3		2	max	-.025	2	.013	2	.151	4	0	1	NC	2	640.657	4
4			min	-.037	1	0	3	0	1	0	1	NC	3	NC	1
5		3	max	-.025	2	0	3	.847	4	0	1	NC	3	209.009	4
6			min	-.037	1	-.212	2	0	1	0	1	1029.508	2	NC	1
7		4	max	-.025	2	0	3	1.861	4	0	1	NC	3	105.506	4
8			min	-.037	1	-.747	2	0	1	0	1	289.715	2	NC	1
9		5	max	-.025	2	0	3	2.965	4	0	1	NC	3	68.55	4
10			min	-.037	1	-1.373	2	0	1	0	1	157.529	2	NC	1
11	M2	1	max	0	1	0	1	0	1	1.061e-2	4	NC	1	NC	1
12			min	0	1	0	1	0	1	0	1	NC	1	NC	1
13		2	max	0	2	0	2	.181	4	1.061e-2	4	NC	2	568.681	4
14			min	0	3	-.025	3	0	1	0	1	4103.767	3	NC	1
15		3	max	.001	2	-.025	2	.265	4	1.061e-2	4	4149.357	2	387.615	4
16			min	0	3	-.037	1	0	1	0	1	2804.962	1	NC	1
17		4	max	0	2	-.017	4	.181	4	1.061e-2	4	6067.398	4	568.681	4
18			min	0	3	-.04	1	0	1	0	1	2595.743	1	NC	1
19		5	max	0	1	0	1	0	1	1.061e-2	4	NC	1	NC	1
20			min	0	1	0	1	0	1	0	1	NC	1	NC	1
21	M3	1	max	0	1	0	1	0	1	5.366e-3	4	NC	1	NC	1
22			min	0	1	0	1	0	1	0	1	NC	1	NC	1
23		2	max	0	3	-.017	4	0	1	5.366e-3	4	6110.205	4	NC	1
24			min	0	2	-.028	1	-.105	4	0	1	3634.13	1	980.847	4
25		3	max	0	3	-.025	2	0	1	5.366e-3	4	4178.75	2	NC	1
26			min	0	2	-.036	1	-.154	4	0	1	2824.88	1	667.275	4
27		4	max	0	3	-.013	2	0	1	5.366e-3	4	7910.292	2	NC	1
28			min	0	2	-.025	3	-.105	4	0	1	4132.806	3	980.847	4
29		5	max	0	1	0	1	0	1	5.366e-3	4	NC	1	NC	1
30			min	0	1	0	1	0	1	0	1	NC	1	NC	1

Envelope Member Section Torsion

Member	Sec		Torque[k-ft]	LC	Torsion Sh...	LC	y-y Warp ...	LC	z-z Warp ...	LC	z-Top War...	LC	z-Bot War...	LC
1	M1	1	max	0	1	0	1	NC		NC		NC		NC
2			min	0	1	0	1	NC		NC		NC		NC
3		2	max	0	1	0	1	NC		NC		NC		NC
4			min	0	1	0	1	NC		NC		NC		NC
5		3	max	0	1	0	1	NC		NC		NC		NC
6			min	0	1	0	1	NC		NC		NC		NC
7		4	max	0	1	0	1	NC		NC		NC		NC
8			min	0	1	0	1	NC		NC		NC		NC
9		5	max	0	1	0	1	NC		NC		NC		NC
10			min	0	1	0	1	NC		NC		NC		NC
11	M2	1	max	0	1	0	1	NC		NC		NC		NC
12			min	0	1	0	1	NC		NC		NC		NC
13		2	max	0	1	0	1	NC		NC		NC		NC
14			min	0	1	0	1	NC		NC		NC		NC
15		3	max	0	1	0	1	NC		NC		NC		NC
16			min	0	1	0	1	NC		NC		NC		NC
17		4	max	0	1	0	1	NC		NC		NC		NC

Company : CENTEK Engineering, INC.
 Designer : jrm, cfc
 Job Number : 10079.CO1 ~ Rev 2

AT&T Pipe Mast Design

Aug 20, 2010
 6:56 AM

Checked By: _____

Envelope Member Section Torsion (Continued)

Member	Sec	Torque[k-ft]	LC	Torsion Sh...	LC	y-y Warp ...	LC	z-z Warp ...	LC	z-Top War...	LC	z-Bot War...	LC
18		min	0	1	0	1	NC		NC		NC		NC
19	5	max	0	1	0	1	NC		NC		NC		NC
20		min	0	1	0	1	NC		NC		NC		NC
21	M3	max	0	1	0	1	NC		NC		NC		NC
22		min	0	1	0	1	NC		NC		NC		NC
23	2	max	0	1	0	1	NC		NC		NC		NC
24		min	0	1	0	1	NC		NC		NC		NC
25	3	max	0	1	0	1	NC		NC		NC		NC
26		min	0	1	0	1	NC		NC		NC		NC
27	4	max	0	1	0	1	NC		NC		NC		NC
28		min	0	1	0	1	NC		NC		NC		NC
29	5	max	0	1	0	1	NC		NC		NC		NC
30		min	0	1	0	1	NC		NC		NC		NC

Envelope AISC ASD Steel Code Checks

Me...	Shape	Code Check	Loc[ft]	LC	Shear Ch...	Loc[ft]	... LC	Fa ...	Ft ...	Fb ...	Fb ...	AS...
1	M1 PIPE_8.0	.713	5.625	2	.081	5.438	4	20...	27...	30...	30...	1.6 1 H1-3
2	M2 HSS6X...	.681	4.28	4	.069	0	z 4	31...	36...	40...	40...	1 H1-2
3	M3 HSS6X...	.423	4.28	4	.041	4.28	z 4	31...	36...	40...	40...	1 H1-2

Company : CENTEK Engineering, INC.
Designer : jrm, cfc
Job Number : 10079.CO1 ~ Rev 2

AT&T Pipe Mast Design

Aug 20, 2010
6:55 AM

Checked By: _____

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N8	0	.468	-4.75	0	0	0
2	4	N7	0	.468	-4.75	0	0	0
3	4	N6	0	.465	2.675	0	0	0
4	4	N5	0	.465	2.675	0	0	0
5	4	Totals:	0	1.864	-4.151			
6	4	COG (ft):	X: 0	Y: 10.769	Z: 0			

Subject:

Connection of Mast to HSS

Location:

Windsor, CT

Rev. 2: 8/24/10

Prepared by: J.R.M.
 Checked by: C.F.C.
 Job No. 10079.CO1

Mast Connection to HSS:

Reactions:

Vertical = Vertical := 1.0-kips (Input From Risa-3D LC #4)
 Horizontal x-dir = Horizontal_z := 9.6-kips (Input From Risa-3D LC #4)

Guy Anchor A Connection Bolt Data:

Use ASTM A307 Steel
 Bolt Ultimate Strength = $F_u := 58\text{-ksi}$ (ASD 9th Ed)
 Bolt Yield Strength = $F_y := 36\text{-ksi}$ (User Input)
 Diameter of Bolt = $D := 0.5\text{-in}$ (User Input)

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.196\text{-in}^2$
 Number of Bolts = $N_b := 2$ (User Input)

Check Anchor Connection Bolt Shear Force:

Shear Stress = $f_v := \frac{\text{Vertical}}{A_g \cdot N_b \cdot 2} \quad f_v = 1.27\text{-ksi}$
 Actual Tension Stress = $f_t := \frac{\text{Horizontal}_z}{A_g \cdot N_b \cdot 2} \quad f_t = 12.22\text{-ksi}$

Bolt Allowable Combined Tension and Shear Stress

For threads included in shear plane use the following formula per Table J3.3, ASD 9th Ed)

Bolt Allowable Shear Stress:

$F_t := (26\text{ksi}) - (1.8) \cdot f_v \quad F_t = 23.71\text{-ksi}$ (ASD 9th Ed Table J3.3)

Connection Bolt Combined Tension and Shear Analysis:

$F_t' := \begin{cases} F_t & \text{if } F_t \leq 20\text{ksi} \\ 20.0\text{ksi} & \text{if } F_t > 20\text{ksi} \end{cases} \quad F_t' = 20.0\text{ksi}$

Condition1 =

Condition1 := $\text{if} \left(\frac{f_t}{F_t'} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$

Bolt Tension % of Capacity =

$\frac{f_t}{F_t'} = 0.61$

Condition1 = "OK"

Subject:

Connection of Mast to Tower

Location:

Windsor, CT

Rev. 2: 8/20/10

Prepared by: J.R.M.
 Checked by: C.F.C.
 Job No. 10079.CO1

Mast Connection to Tower:

Reactions:

Vertical = Vertical := 0.5-kips (Input From Risa-3D LC #4)
 Horizontal x-dir = Horizontal_z := 4.8-kips (Input From Risa-3D LC #4)

Guy Anchor A Connection Bolt Data:

Use ASTM A307 Steel

Bolt Ultimate Strength = $F_u := 58\text{-ksi}$ (ASD 9th Ed)

Bolt Yield Strength = $F_y := 36\text{-ksi}$ (User Input)

Diameter of Bolt = $D := 0.5\text{-in}$ (User Input)

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.196\text{-in}^2$

Number of Bolts = $N_b := 2$ (User Input)

Check Anchor Connection Bolt Shear Force:

Shear Stress = $f_v := \frac{\text{Vertical}}{A_g \cdot N_b \cdot 2}$ $f_v = 0.64\text{-ksi}$
 Actual Tension Stress = $f_t := \frac{\text{Horizontal}_z}{A_g \cdot N_b \cdot 2}$ $f_t = 6.11\text{-ksi}$

Bolt Allowable Combined Tension and Shear Stress

For threads included in shear plane use the following formula per Table J3.3, ASD 9th Ed)

Bolt Allowable Shear Stress:

$F_t := (26\text{ksi}) - (1.8) \cdot f_v$ $F_t = 24.85\text{-ksi}$ (ASD 9th Ed Table J3.3)

Connection Bolt Combined Tension and Shear Analysis:

$F_t' := \begin{cases} F_t & \text{if } F_t \leq 20\text{ksi} \\ 20.0\text{ksi} & \text{if } F_t > 20\text{ksi} \end{cases}$ $F_t' = 20.0\text{ksi}$

Condition1 =

Condition1 := $\text{if} \left(\frac{f_t}{F_t'} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$

Bolt Tension % of Capacity =

$\frac{f_t}{F_t'} = 0.31$

Condition1 = "OK"

TOWER REINFORCEMENT DETAILS	S-1 Sheet No. 1 of 2
---	---



1
S-1

TOWER ELEVATION
SCALE: 1/16" = 1'-0"

STRUCTURAL STEEL

- [illegible]

PAINT NOTES

- [illegible]

[illegible]

Section 1 - RFS GENERAL INFORMATION									
PROJ NAME:	CT1144	DATE:	8/10/2010 8:41	RF DESIGN ENG:	Franco Malabanan	RF PERF ENG:	TBD		
ISSUE:	Final	Approved? (Y/N)	N	RF DESIGN PHONE:	(860) 315-2291	RF PERF PHONE:	TBD		
REVISION:	V02	RF MANAGER:	Walter Sadding	RF DESIGN EMAIL:	fml830@aatt.com	RF PERF EMAIL:	TBD		
INITIATIVE / PROJECT:	2nd carrier add					TBIDENT:	N/A		
						GSM FREQUENCY:	Dual band		
						UMTS FREQUENCY:	850		
						LTE FREQUENCY:	N/A		
						-PLAN JOB NUMBER:	TBD		

Section 2 - LOCATION INFORMATION									
USD:	50388	FA LOCATION CODE:	10035288	LOCATION NAME:	Windsor - Pigeon Hill	ORACLE PROJECT #:	TBD		
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CT	SEARCH RING NAME:	N/A		
ADDRESS:	482 PIGEON HILL ROAD	CITY:	WINDSOR	STATE:	CT	SEARCH RING ID:	N/A		
ZIP CODE:	06095	COUNTY:	HARTFORD	MSA/BSA:	SP	BTA:	T84		
LATITUDE (D-M-S):	41° 51' 59.87"	LONGITUDE (D-M-S):	-72° 40' 29.2"	LAT (DEC DEG.):	41.866631	LONG (DEC DEG.):	-72.674777		
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	TBD					BORDER CELL WITH CONTIGUOUS COORD.	TBD		
						AM STUDY REGO (Y/N):	TBD		
						FREQ CDCCD:	TBD		

Section 3 - LICENSE COVERAGE/FILING INFORMATION									
CGSA - NO FILING TRIGGERED:	TBD	CGSA LOSS:	TBD	PCS REDUCED - UPS ZIP:	TBD				
CGSA - MINOR FILINGS NEEDED:	TBD	CGSA EXT AGMT NEEDED:	TBD	PCS POPS REDUCED:	TBD				
CGSA - MAJOR FILINGS NEEDED:	TBD	CGSA SCORECARD UPGRADE:	TBD						

Section 4 - TOWER/REGULATORY INFORMATION									
STRUCTURE AT & IT OWNED:	TBD	GROUND ELEVATION:	171'	STRUCTURE TYPE:	Lattice Tower	MARKET LOCATION 850 MHz CALL SIGN(S):	TBD		
ADDITIONAL REGULATORY:	TBD	HEIGHT OVERALL:	TBD	FCCASR NUMBER:	TBD	MARKET LOCATION 1900 MHz CALL SIGN(S):	TBD		
SUB-LEASE RIGHTS?	TBD	STRUCTURE HEIGHT:	TBD			MARKET LOCATION 700 MHz CALL SIGN(S):			
LIGHTING TYPE:	TBD					MARKET LOCATION AWS MHz CALL SIGN(S):			

Section 5 - E-911 INFORMATION									
PSAP NAME:		PSAP ID:		E911 PHASE:		MPC SVC PROVIDER:		LMU REQUIRED:	
ALPHA				TBD		TBD		ESRN:	
BETA				TBD		TBD		TBD	
GAMMA				TBD		TBD		TBD	
DELTA								TBD	
EPSILON									
PSI									

Section 6 - RBS GENERAL INFORMATION									
CELL SITE ID:	1144	CDW OR TOY?	NO	CELLULAR NETWORK:	GOLD	DISASTER PRIORITY:	TBD		
CELL SITE TYPE:	SECTORIZED	SITE TYPE:	MACRO	OPS DISTRICT:	CT-North	OPS ZONE:	NE CT N TLDN N CS		
BTS LOCATION ID:	TBD	ORIGINATING CO:	ATT	RF DISTRICT:	Middletown	RF ZONE:	BC105		

Section 7 - RBS SPECIFIC INFORMATION									
GSM 850 RBS	UMTS 1ST CARRIER RBS	UMTS 2ND CARRIER RBS	UMTS 3RD CARRIER RBS	UMTS 4TH CARRIER RBS	LTE RBSs				
MSC	MCT01	TBD	TBD	N/A					
BSC/RNC	BC105	MDTWCINIRNCO01	MDTWCINIRNCO01	N/A					
IAC	05005	6997	6997	N/A					
RAC	TBD	265	265	N/A					
EQUIPMENT VENDOR	NOKIA	ERICSSON	ERICSSON	N/A					
EQUIPMENT TYPE	TBD	RBS3206	RBS3206	N/A					
LOCATION	TBD	TBD	TBD	N/A					
CABINET LOCATION									

Section 8 - RBS INDIVIDUAL INFORMATION											
GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
CELLID/BCF	184D1144	184P1144	CTV1144	N/A	N/A	CTV1144	N/A	N/A	N/A	N/A	N/A
CS COMMON ID	184D1144	184P1144	CTV1144	N/A	N/A	CTU1144	N/A	N/A	N/A	N/A	N/A

Section 9 - SOFT SECTOR ID											
GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS
ALPHA (OR CMNN)	184G11441	184P11441	CTV11441	N/A	N/A	CTU11447	N/A	N/A	N/A	N/A	N/A
BETA	184G11442	184P11442	CTV11442	N/A	N/A	CTU11448	N/A	N/A	N/A	N/A	N/A
GAMMA	184G11443	184P11443	CTV11443	N/A	N/A	CTU11449	N/A	N/A	N/A	N/A	N/A
DELTA											
EPSILON											
PSI											

Section 10 - CID/SAC									
----------------------	--	--	--	--	--	--	--	--	--

Section 15A - CURRENT SECTOR/CELL INFORMATION - ALPHA (OR OMN)												
ANTENNA CONFIG (FROM BACK):	ANTENNA1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	Tx/Rx-Rx / Tx/Rx-Rx / Rx-Tx/Rx / Rx-Tx/Rx		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	MTS/ 850 - GSM / UMTS / 850 - GSM / D		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	3 / 1 1/4" - RFS / 200"		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	MB96RR000200_BL		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	EMS Wireless		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE H" W" x D"	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	TBD		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	143°		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	169°		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	169°		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	-14°		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	0°		2°		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	1°		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPAT	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCH-PLATE POWER (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
ERP (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	2 / CG-1900W850		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	ADC BiasT		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTR POWER CABLE	ADC		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	RxAIT - 850 Band		N/A		N/A		N/A		N/A		N/A	
BAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DIPLEXER (QTY/MODEL)	N/A + 2 / Powerwave LGP 21901		N/A		N/A		N/A		N/A		N/A	
QUADPLEX (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DCBLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	0 / N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	ADC / CG-PDU-SmpPWR		N/A		N/A		N/A		N/A		N/A	
Section 15B - CURRENT SECTOR/CELL INFORMATION - BETA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	Tx/Rx-Rx / Tx/Rx-Rx / Rx-Tx/Rx / Rx-Tx/Rx		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	MTS/ 850 - GSM / UMTS / 850 - GSM / D		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	3 / 1 1/4" - RFS / 260"		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	MB96RR000200_BL		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	EMS Wireless		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE H" W" x D"	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	TBD		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	263°		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	169°		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	169°		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	-14°		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TLT (700/850/1900/AWS)	0°		2°		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	0°		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPAT	850 CCI SCPA		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCH-PLATE POWER (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
ERP (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	2 / CG-1900W850		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	ADC BiasT		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTR POWER CABLE	ADC		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	RxAIT - 850 Band		N/A		N/A		N/A		N/A		N/A	
BAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DIPLEXER (QTY/MODEL)	N/A + 2 / Powerwave LGP 21901		N/A		N/A		N/A		N/A		N/A	
QUADPLEX (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DCBLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	0 / N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	ADC / CG-PDU-SmpPWR		N/A		N/A		N/A		N/A		N/A	
Section 15C - CURRENT SECTOR/CELL INFORMATION - GAMMA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	Tx/Rx-Rx / Tx/Rx-Rx / Rx-Tx/Rx / Rx-Tx/Rx		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	MTS/ 850 - GSM / UMTS / 850 - GSM / D		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	3 / 1 1/4" - RFS / 200"		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	MB96RR000200_BL		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	EMS Wireless		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE H" W" x D"	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	TBD		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	TBD		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	23°		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	169°		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	169°		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	-14°		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TLT (700/850/1900/AWS)	0°		2°		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	0°		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPAT	850 CCI SCPA		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCH-PLATE POWER (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
ERP (Watts)	TBD		TBD		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	2 / CG-1900W850		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	ADC BiasT		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTR POWER CABLE	ADC		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	RxAIT - 850 Band		N/A		N/A		N/A		N/A		N/A	
BAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DIPLEXER (QTY/MODEL)	N/A + 2 / Powerwave LGP 21901		N/A		N/A		N/A		N/A		N/A	
QUADPLEX (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DCBLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	0 / N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	ADC / CG-PDU-SmpPWR		N/A		N/A		N/A		N/A		N/A	
Section 15D - CURRENT SECTOR/CELL INFORMATION - DELTA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)		ANTENNA5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	N/A		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE H" W" x D"	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	N/A		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	N/A		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	N/A		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	N/A		N/A		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	N/A		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPAT	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCH-PLATE POWER (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
ERP (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTR POWER CABLE	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	N/A		N/A		N/A		N/A		N/A		N/A	
BAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DIPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
QUADPLEX (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DCBLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	N/A		N/A		N/A		N/A		N/A		N/A	

Section 15E - CURRENT SECTOR/CELL INFORMATION - EPSILON												
ANTENNA CONFIG (FROM BACQ):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TECHNOLOGY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FEEDERS (# / TYPE/LENGTH)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA MAKE - MODEL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA VENDOR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA SIZE H" x W" x D"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA WEIGHT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA GAIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AZIMUTH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RADIATION CENTER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA TIP HEIGHT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAGNETIC DECLINATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ELECTRICAL TILT (700/850/1900/AWS)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MECHANICAL DOWN TILT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SOA/MOPA?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MOPA MODULES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HATCHPLATE POWER (Watts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ERP (Watts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HYBRID COMBINER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TMA/LNA (TYPE/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTORS FOR TMA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTOR POWER CABLE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA SHARING KIT?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
QAS Filter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURGE ARRESTOR (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DC BLOCK (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RET EQUIPMENT (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RET CABLING	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1900 PDU FOR TMA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Section 15F - CURRENT SECTOR/CELL INFORMATION - ZETA												
ANTENNA CONFIG (FROM BACQ):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TECHNOLOGY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FEEDERS (# / TYPE/LENGTH)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA MAKE - MODEL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA VENDOR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA SIZE H" x W" x D"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA WEIGHT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA GAIN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AZIMUTH	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RADIATION CENTER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA TIP HEIGHT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAGNETIC DECLINATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ELECTRICAL TILT (700/850/1900/AWS)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MECHANICAL DOWN TILT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SOA/MOPA?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MOPA MODULES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HATCHPLATE POWER (Watts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ERP (Watts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HYBRID COMBINER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TMA/LNA (TYPE/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTORS FOR TMA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTOR POWER CABLE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ANTENNA SHARING KIT?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
QAS Filter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURGE ARRESTOR (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DC BLOCK (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RET EQUIPMENT (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RET CABLING	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1900 PDU FOR TMA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - ALPHA (OR OMN)												
ANTENNA CONFIG (FROM BACQ):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	TX/Rx / TX/Rx	Rx / Rx	N/A	N/A	N/A	N/A	TX/Rx / TX/Rx	TX/Rx / TX/Rx	N/A	N/A	N/A	N/A
TECHNOLOGY	UMTS / DB	UMTS / DB	N/A	N/A	N/A	N/A	GSM / DB	GSM / DB	N/A	N/A	N/A	N/A
FEEDERS (# / TYPE/LENGTH)	2 / 1 1/4" - RFS / 200"	N/A	N/A	N/A	N/A	N/A	2 / 1 1/4" - RFS / 200"	N/A	N/A	N/A	N/A	N/A
ANTENNA MAKE - MODEL	AM-X-CD-14-65-00T-RET	N/A	N/A	N/A	N/A	N/A	AM-X-CD-14-65-00T-RET	N/A	N/A	N/A	N/A	N/A
ANTENNA VENDOR	KMW	N/A	N/A	N/A	N/A	N/A	KMW	N/A	N/A	N/A	N/A	N/A
ANTENNA SIZE H" x W" x D"	48.0 x 11.8 x 5.9	N/A	N/A	N/A	N/A	N/A	48.0 x 11.8 x 5.9	N/A	N/A	N/A	N/A	N/A
ANTENNA WEIGHT	36.4	N/A	N/A	N/A	N/A	N/A	36.4	N/A	N/A	N/A	N/A	N/A
ANTENNA GAIN	0.0 dBi	16.0 dBi	N/A	N/A	N/A	N/A	0.0 dBi	16.0 dBi	N/A	N/A	N/A	N/A
AZIMUTH	143°	N/A	N/A	N/A	N/A	N/A	143°	N/A	N/A	N/A	N/A	N/A
RADIATION CENTER	169°	N/A	N/A	N/A	N/A	N/A	169°	N/A	N/A	N/A	N/A	N/A
ANTENNA TIP HEIGHT	171"	N/A	N/A	N/A	N/A	N/A	171"	N/A	N/A	N/A	N/A	N/A
MAGNETIC DECLINATION	-14°	N/A	N/A	N/A	N/A	N/A	-14°	N/A	N/A	N/A	N/A	N/A
ELECTRICAL TILT (700/850/1900/AWS)	0°	2°	N/A	N/A	N/A	N/A	0°	2°	N/A	N/A	N/A	N/A
MECHANICAL DOWN TILT	1°	N/A	N/A	N/A	N/A	N/A	1°	N/A	N/A	N/A	N/A	N/A
SOA/MOPA?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MOPA MODULES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HATCHPLATE POWER (Watts)	TBD	TBD	N/A	N/A	N/A	N/A	TBD	TBD	N/A	N/A	N/A	N/A
ERP (Watts)	TBD	TBD	N/A	N/A	N/A	N/A	TBD	TBD	N/A	N/A	N/A	N/A
NARROW BAND LLC (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HYBRID COMBINER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TMA/LNA (TYPE/MODEL)	1 / Powerwave / TT19-08BP111-001	N/A	N/A	N/A	N/A	N/A	1 / Powerwave / TT19-08BP111-001	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTORS FOR TMA	Andrew ABT-DFDM-ADBH	N/A	N/A	N/A	N/A	N/A	KMW AISG Diplexer	N/A	N/A	N/A	N/A	N/A
CURRENT INJECTOR POWER CABLE	Powerwave	N/A	N/A	N/A	N/A	N/A	Kathrein	N/A	N/A	N/A	N/A	N/A
ANTENNA SHARING KIT?	No RxAIT	N/A	N/A	N/A	N/A	N/A	Spare RxAIT 850	N/A	N/A	N/A	N/A	N/A
QAS Filter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A + 2 / KMW / KDXCV0012017	N/A	N/A	N/A	N/A	N/A	N/A + 2 / KMW / KDXCV0012017	N/A	N/A	N/A	N/A	N/A
DUPLEXER (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURGE ARRESTOR (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DC BLOCK (QTY/MODEL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RET EQUIPMENT (QTY/MODEL)	Built-In / KMW / Built-In RET Equipment	N/A	N/A	N/A	N/A	N/A	Built-In / KMW / Built-In RET Equipment	N/A	N/A	N/A	N/A	N/A
RET CABLING	Daisy chain to ANT4	N/A	N/A	N/A	N/A	N/A	Daisy chain to TEMA of ANT4	N/A	N/A	N/A	N/A	N/A
1900 PDU FOR TMA	LGP 12104 (1900 AND 850 Bypass TMA)	N/A	N/A	N/A	N/A	N/A	Powerwave / 7070	N/A	N/A	N/A	N/A	N/A
Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - BETA												
ANTENNA CONFIG (FROM BACQ):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	TX/Rx / TX/Rx	Rx / Rx	N/A	N/A	N/A	N/A	TX/Rx / TX/Rx	TX/Rx / TX/Rx	N/A	N/A	N/A	N/A
TECHNOLOGY	UMTS / DB	UMTS / DB	N/A	N/A	N/A	N/A	GSM / DB	GSM / DB	N/A	N/A	N/A	N/A
FEEDERS (# / TYPE/LENGTH)	2 / 1 1/4" - RFS / 200"	N/A	N/A	N/A	N/A	N/A	2 / 1 1/4" - RFS / 200"	N/A	N/A	N/A	N/A	N/A
ANTENNA MAKE - MODEL	AM-X-CD-14-65-00T-RET	N/A	N/A	N/A	N/A	N/A	AM-X-CD-14-65-00T-RET	N/A	N/A	N/A	N/A	N/A
ANTENNA VENDOR	KMW	N/A	N/A	N/A	N/A	N/A	KMW	N/A	N/A	N/A	N/A	N/A
ANTENNA SIZE H" x W" x D"	48.0 x 11.8 x 5.9	N/A	N/A	N/A	N/A	N/A	48.0 x 11.8 x 5.9	N/A	N/A	N/A	N/A	N/A
ANTENNA WEIGHT	36.4	N/A	N/A	N/A	N/A	N/A	36.4	N/A	N/A	N/A	N/A	N/A
ANTENNA GAIN	0.0 dBi	16.0 dBi	N/A	N/A	N/A	N/A	0.0 dBi	16.0 dBi	N/A	N/A	N/A	N/A
AZIMUTH	263°	N/A	N/A	N/A	N/A	N/A	263°	N/A	N/A	N/A	N/A	N/A
RADIATION CENTER	169°	N/A	N/A	N/A	N/A	N/A	169°	N/A	N/A	N/A	N/A	N/A
ANTENNA TIP HEIGHT	171"	N/A	N/A	N/A	N/A	N/A	171"	N/A	N/A	N/A	N/A	N/A</

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - GAMMA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	Tx/Rx / Tx/Rx		Tx/Rx / Tx/Rx		Tx/Rx / Tx/Rx		Tx/Rx / Tx/Rx		Tx/Rx / Tx/Rx			
TECHNOLOGY	N/A		N/A		N/A		N/A		N/A			
FEEDERS (# / TYPE/LENGTH)	2 / 1 1/4" - RFS / 200'		2 / 1 1/4" - RFS / 200'		2 / 1 1/4" - RFS / 200'		2 / 1 1/4" - RFS / 200'		2 / 1 1/4" - RFS / 200'			
ANTENNA MAKE - MODEL	AM-X-CD-14-65-00T-RET		AM-X-CD-14-65-00T-RET		AM-X-CD-14-65-00T-RET		AM-X-CD-14-65-00T-RET		AM-X-CD-14-65-00T-RET			
ANTENNA VENDOR	KMW		KMW		KMW		KMW		KMW			
ANTENNA SIZE (H" W" D")	48.0 x 11.8 x 5.9		48.0 x 11.8 x 5.9		48.0 x 11.8 x 5.9		48.0 x 11.8 x 5.9		48.0 x 11.8 x 5.9			
ANTENNA WEIGHT	36.4		36.4		36.4		36.4		36.4			
ANTENNA GAIN	0.0 dBi		16.0 dBi		N/A		N/A		0.0 dBi		N/A	
AZIMUTH	23°		N/A		N/A		N/A		23°		N/A	
RADIATION CENTER	169'		N/A		N/A		N/A		169'		N/A	
ANTENNA TIP HEIGHT	171'		N/A		N/A		N/A		171'		N/A	
MAGNETIC DECLINATION	-14°		N/A		N/A		N/A		-14°		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	0°		2°		N/A		N/A		0°		2°	
MECHANICAL DOWN TILT	N/A		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPA?	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCHPLATE POWER (Watts)	TBD		TBD		N/A		N/A		TBD		N/A	
ERP (Watts)	TBD		TBD		N/A		N/A		TBD		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	1 / Powerwave / TT 10-08BP111-001		N/A		N/A		N/A		1 / Powerwave / TT 10-08BP111-001		N/A	
CURRENT INJECTORS FOR TMA	Andrew ABT-OFDM-ADBH		N/A		N/A		N/A		KMW AISG Diplexor		N/A	
CURRENT INJECTOR POWER CABLE	Powerwave		N/A		N/A		N/A		Kathrein		N/A	
ANTENNA SHARING KIT?	No RxAIT		N/A		N/A		N/A		Spare RxAIT 850		N/A	
GAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DUPLEXER (QTY/MODEL)	N/A + 2 / KMW / KDXCV0012017		N/A		N/A		N/A		N/A + 2 / KMW / KDXCV0012017		N/A	
QUADPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DC BLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	Built-in / KMW / Built-in RET Equipment		N/A		N/A		N/A		Built-in / KMW / Built-in RET Equipment		N/A	
RET CABLING	Daisy chain to ANT4		N/A		N/A		N/A		Daisy chain to TMA of ANT4		N/A	
1900 PDU FOR TMAS	LGP 12104 (1900 AND 850 Bypass TMA)		N/A		N/A		N/A		Powerwave / 7070		N/A	
Section 16D - NEW/PROPOSED SECTOR/CELL INFORMATION - DELTA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	N/A		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE (H" W" D")	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	N/A		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	N/A		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	N/A		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	N/A		N/A		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	N/A		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPA?	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCHPLATE POWER (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
ERP (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTOR POWER CABLE	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	N/A		N/A		N/A		N/A		N/A		N/A	
GAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DUPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
QUADPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DC BLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	N/A		N/A		N/A		N/A		N/A		N/A	
Section 16E - NEW/PROPOSED SECTOR/CELL INFORMATION - EPSILON												
ANTENNA CONFIG (FROM BACK):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	N/A		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE (H" W" D")	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	N/A		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	N/A		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	N/A		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	N/A		N/A		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	N/A		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPA?	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCHPLATE POWER (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
ERP (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTOR POWER CABLE	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	N/A		N/A		N/A		N/A		N/A		N/A	
GAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DUPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
QUADPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DC BLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	N/A		N/A		N/A		N/A		N/A		N/A	
Section 16F - NEW/PROPOSED SECTOR/CELL INFORMATION - ZETA												
ANTENNA CONFIG (FROM BACK):	ANTENNA1		ANTENNA2		ANTENNA3		ANTENNA4		ANTENNA5			
	GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)		GSM, UMTS (850 / 1900) or LTE (700 / AWS)			
TX/RX?	N/A		N/A		N/A		N/A		N/A		N/A	
TECHNOLOGY	N/A		N/A		N/A		N/A		N/A		N/A	
FEEDERS (# / TYPE/LENGTH)	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA MAKE - MODEL	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA VENDOR	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SIZE (H" W" D")	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA WEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA GAIN	N/A		N/A		N/A		N/A		N/A		N/A	
AZIMUTH	N/A		N/A		N/A		N/A		N/A		N/A	
RADIATION CENTER	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA TIP HEIGHT	N/A		N/A		N/A		N/A		N/A		N/A	
MAGNETIC DECLINATION	N/A		N/A		N/A		N/A		N/A		N/A	
ELECTRICAL TILT (700/850/1900/AWS)	N/A		N/A		N/A		N/A		N/A		N/A	
MECHANICAL DOWN TILT	N/A		N/A		N/A		N/A		N/A		N/A	
SCPA/MCPA?	N/A		N/A		N/A		N/A		N/A		N/A	
MCPA MODULES	N/A		N/A		N/A		N/A		N/A		N/A	
HATCHPLATE POWER (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
ERP (Watts)	N/A		N/A		N/A		N/A		N/A		N/A	
NARROW BAND LLC (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
HYBRID COMBINER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
TMA/LNA (TYPE/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTORS FOR TMA	N/A		N/A		N/A		N/A		N/A		N/A	
CURRENT INJECTOR POWER CABLE	N/A		N/A		N/A		N/A		N/A		N/A	
ANTENNA SHARING KIT?	N/A		N/A		N/A		N/A		N/A		N/A	
GAS Filter	N/A		N/A		N/A		N/A		N/A		N/A	
DUPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
QUADPLEXER (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
SURGE ARRESTOR (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
DC BLOCK (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET EQUIPMENT (QTY/MODEL)	N/A		N/A		N/A		N/A		N/A		N/A	
RET CABLING	N/A		N/A		N/A		N/A		N/A		N/A	
1900 PDU FOR TMAS	N/A		N/A		N/A		N/A		N/A		N/A	

AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

Dual Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V17.0°

1710 ~ 2170MHz, X-pol., H65° / V8.5°

Electrical Specification

Frequency Range	698~894MHz	1710~2170MHz
Impedance	50Ω	
Polarization	Dual, Slant ±45°	
Gain	14.0dBi / 11.85dBd @ 698-806MHz 14.8dBi / 12.65dBd @ 824-894MHz	16.1dBi / 13.95dBd @ 1710-1755MHz 16.3dBi / 14.15dBd @ 1850-1900MHz 16.0dBi / 13.85dBd @ 2110-2155MHz
Beamwidth	Horizontal	67° @ 698-806MHz 65° @ 824-894MHz
	Vertical	17.5 @ 698-806MHz 16.5° @ 824-894MHz
VSWR	≤1.5:1	
Front-to-Back Ratio	≥28 dB	
Electrical Downtilt Range	2° ~ 16°	0° ~ 10°
Isolation Between Ports	≥30 dB	
Isolation Between Ports of Different Frequency Elements	≥35 dB	
Cross Pole Discrimination	10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression	16dB	
Side Lobe Suppression	> 16dB @ 0-6° Tilt > 18dB @ 7-12° Tilt (Up to 15° from Boresight)	> 16dB @ 0-6° Tilt > 18dB @ 7-10° Tilt (Up to 15° from Boresight)
Passive Intermodulation	≤ -150 dBc @ 2x20w	
Input Maximum CW Power	500 W	300 W
Environmental Compliance	IP65 for Radome IP67 for Connectors	
RET Motor Configuration	Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0	AISG 1.1 and 2.0	

Mechanical Specification

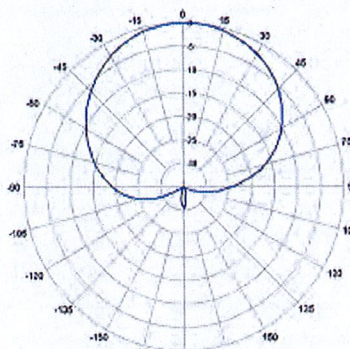
Dimension (W×D×H)	11.8×5.9×48 inches (300×150×1219mm)
Weight (Without clamp)	16.5 kg (36.4 lbs)
Connector	4 x 7/16 DIN(F), Long Neck
Max Wind Speed	150mph
Wind Load (@150 mph)	1260 N

AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

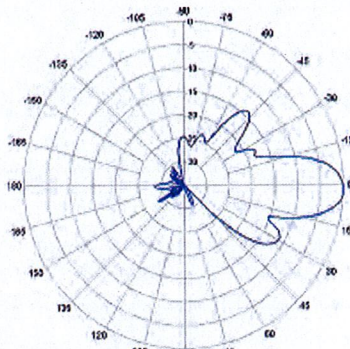
KMW Communications

Base Station Antennas

For Mobile Communications

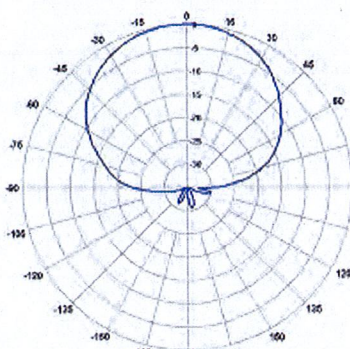


Horizontal Pattern

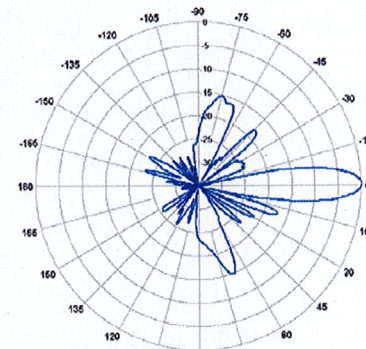


Vertical Pattern (Downtilt 2°)

700MHz band Pattern

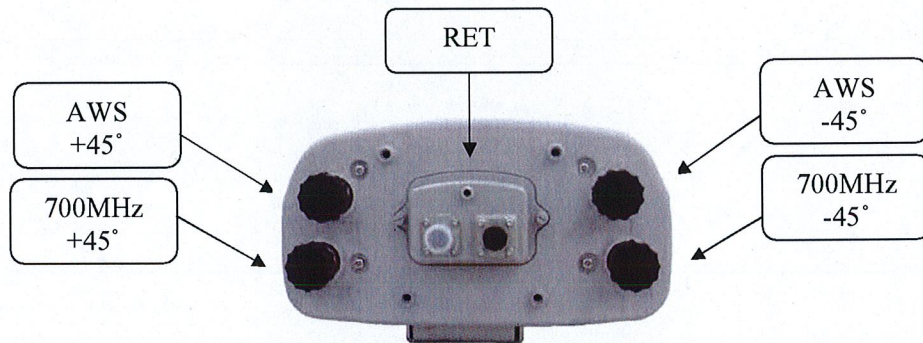


Horizontal Pattern



Vertical Pattern (Downtilt 0°)

AWS band Pattern



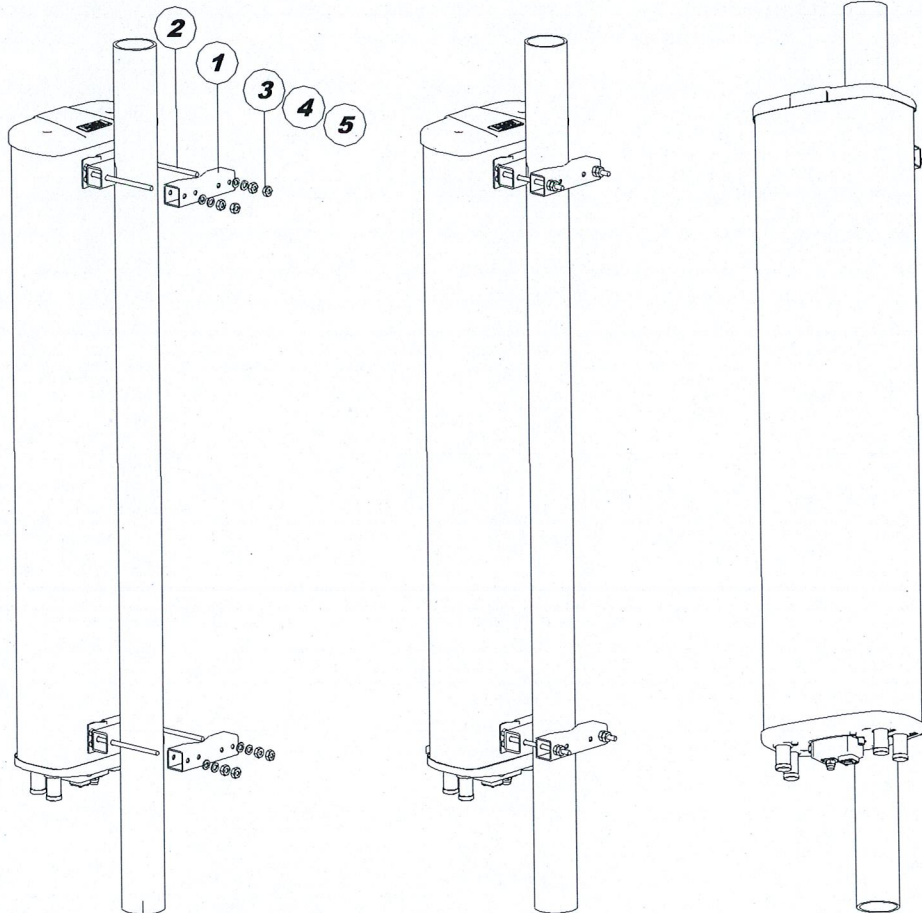
AM-X-CD-14-65-00T-RET (4' 65° Dual Broadband Antenna)

Antenna Drawings and Installation Diagram

KMW Communications

Base Station Antennas

For Mobile Communications



MOUNT POLE
Ø1.97 ~ 3.15inch OD.
(50 ~ 80mm OD.)

STANDARD MOUNTING KITS

No.	PART NAME	Q'TY	Recommending Torque
1	FIXED CLAMP	4	
2	Hex. Cap Bolt, M10	4	17mm Spanner
3	Plain Washer, M10	4	208lbf.inch
4	Spring Washer, M10	4	240kgf.cm
5	Hex. Nut, M10	8	

TT19-08BP111-001

TMA Twin 1900 with 850 Bypass 12 dB AISG 1.1

ELECTRICAL SPECIFICATIONS

UL Frequency Range (MHz)	1850-1910 with 824-894 bypass
UL Rejection	>77 dB
UL Gain(dB)	12
UL Return Loss	>18
UL Noise Figure	<1.7 dB, Typical
UL Output 3rd Order Intercept Point(dBm)	>+23
UL Bypass Loss(dB)	2.5, Typical
UL Max Input Power (dBm)	+14 dBm
DL Frequency Range (MHz)	1930-1990 with 824-894 bypass
DL Return Loss	>18
DL Insertion Loss (dB)	850 MHz, <0.3; 1900 MHz, <0.5
Intermodulation	@ 2 x +43 dBm TX carriers, in receive band, <160 dBc, referred to antenna port
Input Voltage (V)	AISG Mode: 10-30; Current alarm mode: 8 -17
Alarm Functionality	AISG compatible or in case of no AISG command received, current alarm mode 170-190 mA
Power Consumption	<1.1W @12V
Power Handling, RMS	850: >57 dBm; 1900: >55 dBm
AISG Compatibility	AISG 1.1 fully upgradable to AISG 2.0 (AISG version only dependent on loaded SW version) TT19-08BP112-001 has AISG 2.0 loaded from factory

MECHANICAL SPECIFICATIONS

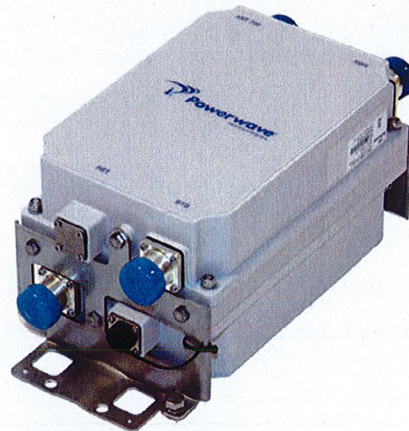
Dimension HxWxD mm(ft)	250x169x137 mm (9.9"x6.7"x5.4")
Weight(lbs)	<16
Colors	Off white (NCS 1502-R)
RF Connectors	DIN 7/16 female, long neck
Mounting Kit	Mounting kit for pole and wall is included

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-40° C to +65° C (-40° F to +149° F)
Operational	ETS 300 019-1-4
Transportation	ETS 300 019-1-2
Storage	ETS 300 019-1-1
Lightning Protection	3 kA 10/350 µs; 20 kA (Shield)
Housing	Aluminum
MTBF	>1 million hours per TMA
Ingress Protection	IP65 and IP68

APPROVAL AND TESTS

Safety	EN60950
EMC	3GPP: TS 25.113



*All specifications subject to change without notice. Contact your Powerwave representative for complete performance data.



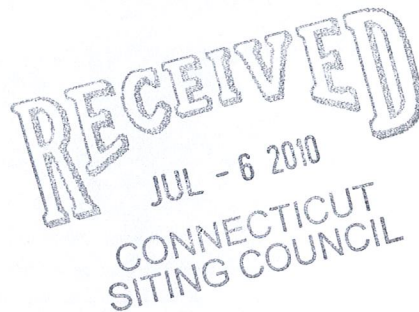
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

Steven L. Levine
Real Estate Consultant

HAND DELIVERED

July 6, 2010

Honorable Daniel F. Caruso, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051



Re: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 482 Pigeon Hill Road, Windsor (owner, Verizon)

Dear Chairman Caruso and Members of the Council:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the chief elected official of the municipality in which the affected cell site is located.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile (GSM) communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound other than some enlarged equipment pads as may be noted in the attachments.
3. The proposed changes will not increase the noise level at the existing facility by six decibels or more.
4. Radio frequency power density may increase due to use of one or more GSM channel for UMTS transmissions. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 513-7636 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine
Real Estate Consultant

Attachments

**NEW CINGULAR WIRELESS
Equipment Modification**

482 Pigeon Hill Road
Site Number 1144
Docket 58.11; Exempt Mods approved 12/00 and 10/02

Tower Owner/Manager: Verizon

Equipment configuration: Self-Supporting Lattice

Current and/or approved: Three flush-mounted EMS antennas @ 169 ft
Six TMA's @ 169 ft
4"-diameter pipe mast
Nine runs 1 ¼ inch coax
Equipment Shelter

Planned Modifications: Remove existing antennas and TMA's
Remove existing 4"-diameter pipe mast
Install 8"-diameter pipe mast
Install T-arm antenna mounts
Install six Powerwave P65-15 antennas (or equivalent) @ 169 ft
Install six Powerwave TMA's @ 169 ft
Install three additional runs 1 ¼ inch coax

Power Density:

Calculations for AT&T's current operations at the site indicate a radio frequency electromagnetic radiation power density, measured at the tower base, of approximately 22.2 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density for AT&T's planned operations would be approximately 21.8 % of the standard.

Existing

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *							16.47
AT&T TDMA *	169	880 - 894	16	100	0.0201	0.5867	3.43
AT&T GSM *	169	1900 Band	2	427	0.0108	1.0000	1.08
AT&T GSM *	169	880 - 894	2	296	0.0075	0.5867	1.27
Total							22.2%

* Per CSC records.

Proposed

Company	Centerline Ht (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	Percent of Limit
Other Users *							16.47
AT&T GSM	169	880 - 894	4	296	0.0149	0.5867	2.54
AT&T GSM	169	1900 Band	2	427	0.0108	1.0000	1.08
AT&T UMTS	169	1900 Band	1	500	0.0063	1.0000	0.63
AT&T UMTS	169	880 - 894	1	500	0.0063	0.5867	1.07
Total							21.8%

* Per CSC records.

Structural information:

The attached structural analysis (Centek Engineering, 6/10) demonstrates that the tower and foundation have sufficient structural capacity to accommodate the proposed equipment.

PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
 SITE ADDRESS: 482 PIGEON HILL RD
 WINDSOR, CT 06095
 LATITUDE: 41.866631 N 41° 51' 59.87" N
 LONGITUDE: -72.674777 W -72° 40' 29.20" W
 JURISDICTION: NATIONAL STATE & LOCAL CODES OR ORDINANCES
 CURRENT USE: TELECOMMUNICATIONS FACILITY
 PROPOSED USE: TELECOMMUNICATIONS FACILITY
 NDC#: 866-915-5600



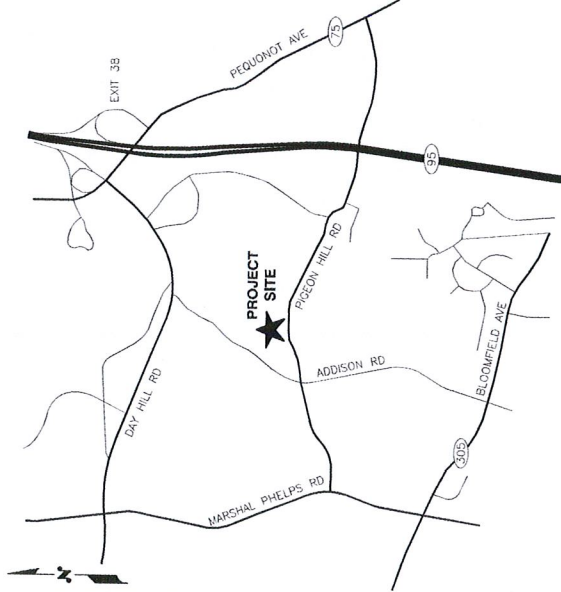
SITE NUMBER: CT 1144 WINDSOR - PIGEON HILL

DRAWING INDEX

T-1	TITLE SHEET	REV
GN-1	GENERAL NOTES	1
A-1	COMPOUND & SHELTER PLAN	1
A-2	ANTENNA LAYOUT AND ELEVATION	1
G-1	GROUNDING, ONE-LINE DIAGRAM & DETAILS	1

VICINITY MAP

DIRECTIONS TO SITE:
 START AT 500 ENTERPRISE DR, ROCKY HILL GOING TOWARD CAPITOL BLVD - GO 0.3 MI, TURN LEFT ON CAPITOL BLVD - GO 0.3 MI, TURN LEFT ON WEST ST - GO 0.2 MI, TURN LEFT TO TAKE RAMP ONTO I-91 N TOWARD HARTFORD - GO 15.3 MI, TAKE EXIT #37/BLOOMFIELD AVE/WINDSOR - GO 0.2 MI, TURN LEFT ON BLOOMFIELD AVE(CT-305 W) - GO 0.9 MI, TURN RIGHT ON ADDISON RD, TURN LEFT, RIGHT ON PIGEON HILL RD - GO 0.1 MI, ARRIVE AT 482 PIGEON HILL RD, WINDSOR, ON THE LEFT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN PERMISSION IS STRICTLY PROHIBITED. THE INFORMATION CONTAINED HEREIN IS FOR THE PURPOSES OF THE PROJECT ONLY. OTHER THAN THE FULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSIBLE BY AUTHORIZED PERSONNEL FOR ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SERVICES. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL



BEFORE YOU DIG

CALL TOLL FREE 800-922-4455



UNDERGROUND SERVICE ALERT



22 KEENEWAYDIN DRIVE
 SALEM, NH 03079



500 ENTERPRISE DRIVE, SUITE 3A
 ROCKY HILL, CT 06067

SITE NUMBER: CT 1144
 SITE NAME: WINDSOR - PIGEON HILL
 482 PIGEON HILL RD
 WINDSOR, CT 06095
 HARTFORD COUNTY

1	06/26/10	CONSTRUCTION FINAL	PG	HC	DPH	AT&T
0	08/10/10	ISSUED FOR CONSTRUCTION	PG	HC	DPH	TITLE SHEET
NO.	DATE	REVISIONS	BY	CHK	APP'D	DRAWING NUMBER
SCALE:	AS SHOWN	DESIGNED BY: PG	DRAWN BY: PG			T-1
						1



New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

Steven L. Levine
Real Estate Consultant

July 6, 2010

Peter Souza, Town Manager
Town of Windsor
Town Hall 275 Broad Street
Windsor, CT 06095-0472

Re: Telecommunications Facility – 482 Pigeon Hill Road, Windsor

Dear Mr. Souza:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") capability, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T's proposal. Please accept this letter as notification under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The accompanying letter to the Siting Council fully describes AT&T's proposal for the referenced cell site. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7636 or Mr. Derek Phelps, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Steven L. Levine
Real Estate Consultant

Enclosure

Structural Analysis Report

160' Existing ROHN Lattice Tower

Proposed AT&T UMTS Antenna Upgrade

AT&T Site Ref: CT1144

*482 Pigeon Hill Road
Windsor, CT*

CEN TEK Project No. 10079-CO1

~~Date: May 24, 2010~~

Revision 1: June 24, 2010

A blue ink signature is written over a red circular professional engineer seal for the State of Connecticut. The seal contains the text "STATE OF CONNECTICUT", "PROFESSIONAL ENGINEER", and "LICENSED".

Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Introduction

The purpose of this report is to summarize the results of the non-linear, P- Δ structural analysis of the antenna installation/modification proposed by AT&T on the existing self supporting lattice tower located in Windsor, Connecticut.

The host tower is a 160-ft, three legged, tapered lattice tower originally designed and manufactured by UNR-ROHN. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes, tower reinforcements and foundation reinforcements were taken from a structural analysis report prepared by Natcomm, Inc; project no. 10001.CO8, Rev. 1 dated February 3, 2010. Antenna and appurtenance inventory were taken from the aforementioned Natcomm, Inc. structural analysis report and a AT&T RF data sheet.

The tower is made of eight (8) tapered vertical sections consisting of structural steel pipe legs. Diagonal lateral support bracing consists of structural steel angle shapes. The vertical tower sections are connected by bolted flange plates while the pipe legs and bracing are connected by welded and bolted gusset connections. The width of the tower face is 8.56-ft at the top and 22.85-ft at the base.

AT&T proposes the removal of one (1) existing antenna pipe mast, the replacement of three (3) panel antennas and six (6) TMAs with six (6) panel antennas, six (6) TMAs and the installation of three (3) 10-ft 6in T-Arms all mounted to one (1) antenna pipe mast. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing tower was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (EXISTING):
Antenna: One (1) 15-ft x 2-in $\varnothing$ Omni-directional (whip) antenna mounted with an elevation of ± 167.5 -ft above the tower base.
Coax Cable: One (1) 7/8" $\varnothing$ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing):
Antennas: Six (6) Antel LPA-80063-4CF, six (6) Decibel DB948F85T2E-M, two (2) Antel BXA-70040/6CF and one (1) Antel BXA-70063/6CF panel antennas mounted on three (3) Valmont 15-ft T-Frames (P/N 860109) with a RAD center elevation of ± 156.5 -ft above the existing tower base.
Coax Cables: Eighteen (18) 1-5/8" $\varnothing$ coax cables running on the face of the existing tower configured in 2 rows of 9 cables as specified in Section 3 of this report.
- T-MOBILE (Existing):
Antennas: Six (6) RFS APXV18-209014, three (3) RFS APX16DWV-16DWVS-C-A20 panel antennas and nine (9) TMA's mounted on three (3) 15-ft Wireless Frames with a RAD center elevation of ± 147 -ft above the existing tower base.
Coax Cables: Eighteen (18) 1-5/8" $\varnothing$ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
Antenna: One (1) 15-ft x 2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±127.5-ft above the tower base.
Coax Cable: One (1) 7/8" Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 8-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±111.33-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 6-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±102-ft above the tower base.
Coax Cable: One (1) EW90 Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 16-ft x 2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±108-ft above the tower base.
Coax Cable: One (1) 7/8" Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 6-ft Ø dish antenna on a 5-ft x 4.5-in Ø pipe mount with an elevation of ±94-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
Antenna: One (1) 10-ft Ø dish antenna on a 6-ft 8-in x 4-in Ø pipe mount with an elevation of ±72-ft above the tower base.
Coax Cable: One (1) EW63 cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (EXISTING):
Antenna: One (1) empty 4-ft side mount standoff with an elevation of ±47-ft above the tower base.
Coax Cables: Not applicable.
- UNKNOWN (Existing):
Antenna: One (1) 12-ft x 1-1/2-in Ø Omni-directional (whip) antenna on a 4-ft side mount standoff with an elevation of ±45.41-ft above the tower base.
Coax Cable: One (1) 1/2-in Ø coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- **AT&T (Existing to Remove):**
Antennas: Three (3) MB96RR900200DPBL panel antennas and six (6) TMA's mounted on a 10-ft x 4-in Ø pipe with a RAD center elevation of ±167.75-ft above the existing tower base.
Pipe Mast: One (1) 10-ft x 4-in Ø pipe mast and related mounting hardware.
- **AT&T (Existing to Remain)**
Coax Cables: Nine (9) 1-1/4" Ø coax cables running on a leg/face of the existing tower as specified on drawing SK-1 within Section 3 of this report.
- **AT&T (Proposed):**
Antennas: Six (6) Powerwave P65-15-XL panel antennas, six (6) Powerwave TT08-19DB111 TMA's, twelve (12) Powerwave CM1007-DBPXBC Diplexers and six (6) RETs mounted on three (3) 10-ft-6in T-Arms, Valmont P/N 802738 all connected to a 8" SCH.40 x 18-ft long PCS mast with a RAD center elevation of ±169-ft above the existing tower base.
Coax Cables: Three (3) 1-1/4" Ø coax cables running on a leg/face of the existing tower as specified on drawing EL-1 within Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- **All coax cables shall be routed as specified on drawing EL-1 within Section 3 of this report.**
- **Tower and foundation reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 were implemented (See section 5 of this report).**

Analysis

The existing tower was analyzed using a comprehensive computer program entitled RISATower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower legs, and the model assumes that the leg members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 80 mph basic wind speed (fastest mile) with no ice and 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	[Section 16 of TIA/EIA-222-F-96]
	Windsor; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	[Appendix K of the 2005 CT Building Code Supplement]
	<i>TIA/EIA wind speed Controls</i>	
Load Cases:	<u>Load Case 1</u> ; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design of monopole towers.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 2</u> ; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed. This load case typically controls the design of lattice towers.	[Section 2.3.16 of TIA/EIA-222-F-96]
	<u>Load Case 3</u> ; Seismic – not checked	[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type

Results

LATTICE TOWER

Tower stresses were calculated utilizing the structural analysis software RISATower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- With the reinforcements outlined within section 3 of this report the calculated stresses were found to be within allowable limits. In Load Case 1, per RISATower "Section Capacity Table", this tower was found to be at **97.1%** of its total capacity.

	Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
With Proposed Reinforcements	Leg (T2)	120'-0"-140'-0"	97.1%	PASS
	Diagonal (T5)	60'-0"-80'-0"	96.0%	PASS

Note 1: Results based on implementation of previously proposed structural steel reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless.

PCS MAST

- The existing AT&T antenna pipe mast was determined to be structurally inadequate. Replacement of the existing antenna mast with a 8 SCH. 40 Pipe x 18 -ft long (O.D. = 8.625"), conforming to ASTM A53, Grade B, Fy = 35 ksi specifications will be required.

Foundation and Anchors

The existing foundation consists of three (3) 3-ft $\varnothing$ reinforced concrete piers on three (3) 8-ft square reinforced concrete pads subsequently reinforced with an internal 8' thick concrete mat bearing directly on existing sub grade. The existing foundation locations and dimensions were taken from the aforementioned Natcomm structural analysis report. Allowable soil bearing pressure was assumed to be 4,500 psi for the analysis. Tower legs are connected to the three (3) piers by means of (6) 7/8" $\varnothing$, ASTM A354 Grade BC anchor bolts per leg, embedded into the concrete foundation structure.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower leg reactions developed from the governing Load Case 1 of the proposed reinforced tower condition were used in the verification of the foundation and anchor bolts:

Leg Reactions	Vector	Proposed Load (kips)
Leg	Shear	22
	Compression	191
	Uplift	163

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	80.0%	PASS

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS) ⁽¹⁾	Proposed Loading (FS) ⁽¹⁾	Result
(3) Reinf. Conc. Pad and Pier w/ Reinf. Conc. Mat	OM ⁽²⁾	2.00	2.36	PASS

Note 1: FS denotes Factor of Safety

Note 2: OM denotes Overturning Moment

Note 3: Results based on implementation of foundation reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless.

Conclusion

This analysis indicates that the subject tower is adequate to support the proposed antenna installation with the implementation of previous reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless and additional proposed reinforcements as detailed within section 3 of this report.

The analysis is based, in part, on the information provided to this office by AT&T. 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:

Prepared by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

Jason R. Mead
Structural Engineer

CEN TEK Engineering, Inc.

Structural Analysis – 160' Rohn Lattice Tower

AT&T UMTS Antenna Upgrade – CT1144

Windsor, CT

Rev 1 ~ June 24, 2010

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	80.0%	PASS

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS) ⁽¹⁾	Proposed Loading (FS) ⁽¹⁾	Result
(3) Reinf. Conc. Pad and Pier w/ Reinf. Conc. Mat	OM ⁽²⁾	2.00	2.36	PASS

Note 1: FS denotes Factor of Safety

Note 2: OM denotes Overturning Moment

Note 3: Results based on implementation of foundation reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless.

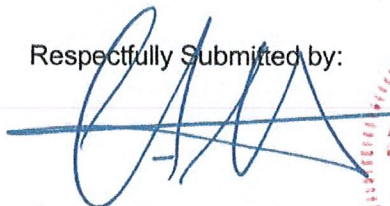
Conclusion

This analysis indicates that the subject tower is adequate to support the proposed antenna installation with the implementation of previous reinforcements as detailed on Natcomm drawings S-1 through S-3 Rev 1 dated 2/3/10 prepared for Verizon Wireless and additional proposed reinforcements as detailed within section 3 of this report.

The analysis is based, in part, on the information provided to this office by AT&T. 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.

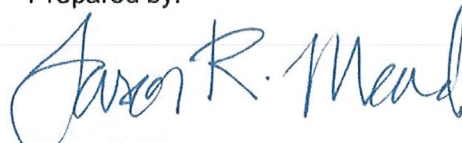
Respectfully Submitted by:



Carlo F. Centore, PE
Principal ~ Structural Engineer



Prepared by:



Jason R. Mead
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:

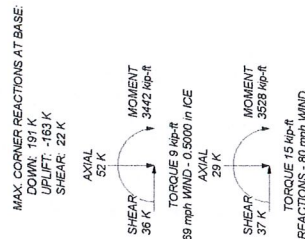
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provide 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.

General Description of Structural Analysis Program

RISATower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, RISATower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

RISATower Features:

- RISATower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- RISATower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



Section	18	17	16	15	14	13	12	11
Weight	ROHN 6 EHS			ROHN 5 EHS			ROHN 4 EHS	
A572-60								
Diagonals	L6x4/14			L3 1/2x3 1/2x14			L3x3/14	L2x3/16
Diagonal Grade	A36							
Top Chords	N.A.							
Spec Horizontals	N.A.			L3x3/14	L2x3/16	L2 1/2x2 1/2x3/16	N.A.	
Base Width (in)	20.85	18.69	16.69	14.69	12.6	10.56	8.56	
Flare (in)	8 @ 10							
Weight (in)	13	28	27	25	21	16	13	10

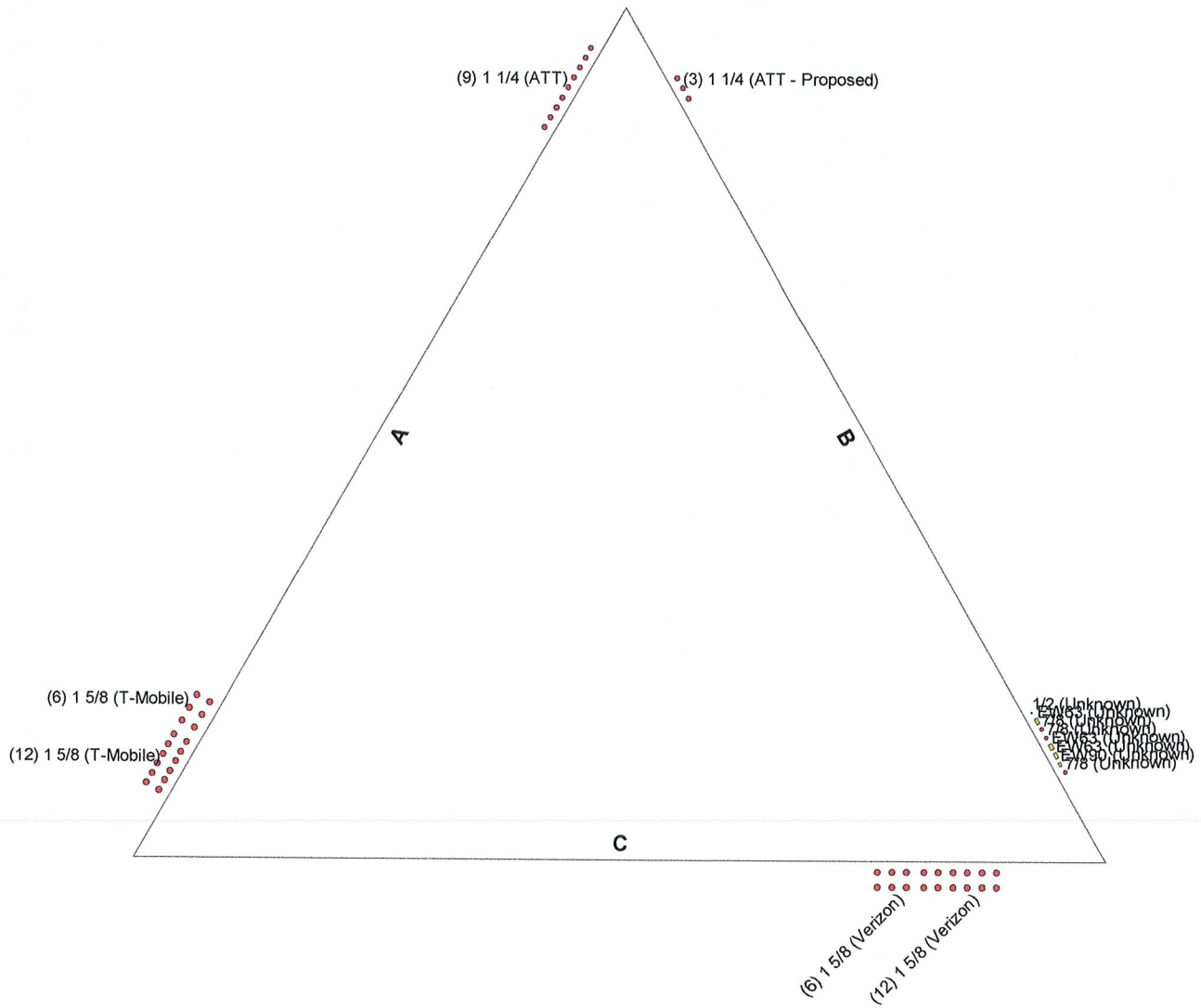
TYPE	ELEVATION	TYPE	ELEVATION
(2) P6C-15x3 (ATI - Proposed)	169	Valmont 15' L-frame PN 86202 (Unavail)	168
(2) P6C-15x3 (ATI - Proposed)	169	Valmont 15' L-frame PN 86202 (Unavail)	168
(2) P6C-15x3 (ATI - Proposed)	169	Valmont 15' L-frame PN 86202 (Unavail)	168
(2) T10B-10B3111-001 TMA (ATI - Proposed)	169	15' Frame (T-Mobile)	147
(2) T10B-10B3111-001 TMA (ATI - Proposed)	169	15' Frame (T-Mobile)	147
(2) T10B-10B3111-001 TMA (ATI - Proposed)	169	(2) APXN-18-208914 (T-Mobile)	147
(2) C4K1007-08P95BC Diplexer (ATI - Proposed)	169	(2) APXN-18-208914 (T-Mobile)	147
(2) C4K1007-08P95BC Diplexer (ATI - Proposed)	169	APXN18WV-180WVSC-3-2 (T-Mobile)	147
(2) RET (ATI - Proposed)	169	APXN18WV-180WVSC-3-2 (T-Mobile)	147
(2) RET (ATI - Proposed)	169	15' Frame (T-Mobile)	147
(2) RET (ATI - Proposed)	169	15' Frame (T-Mobile)	147
Valmont Uni-Trin Brackets (ATI - Proposed)	169	TMA (T-Mobile)	147
Valmont 10'5" L-frame 3 (Cable Kit PN 802748) (ATI - Proposed)	169	TMA (T-Mobile)	147
15' x 2" Dia Omm (Unavail)	167.5	(2) TMA 10'x6'30" (T-Mobile)	147
Pig x1/4" Pipe Mast (ATI - Proposed)	163	(2) TMA 10'x6'30" (T-Mobile)	147
DB94618517254M (Unavail)	166.5	(2) TMA 10'x6'30" (T-Mobile)	147
DB94618517254M (Unavail)	166.5	15' Frame (T-Mobile)	127.5
DB94618517254M (Unavail)	166.5	15' x 2" Dia Omm (Unavail)	117.75
DB94618517254M (Unavail)	166.5	4 Side Mount Standoff (Unavail)	117.75
DB94618517254M (Unavail)	166.5	4 Side Mount Standoff (Unavail)	117.75
DB94618517254M (Unavail)	166.5	3 FT Dish (Unavail)	111.33
DB94618517254M (Unavail)	166.5	15' x 2" Dia Omm (Unavail)	108
LPA-8003-AC7 (Verizon)	166.5	SV7457 Pipe Mount (Unavail)	108.2
LPA-8003-AC7 (Verizon)	166.5	6 FT Dish (Unavail)	102
DB94618517254M (Verizon)	166.5	4 Side Mount Standoff (Unavail)	99
DB94618517254M (Verizon)	166.5	6 FT Dish (Unavail)	94
LPA-8003-AC7 (Verizon)	166.5	SV7457 Pipe Mount (Unavail)	90.83
SV7457 Pipe Mount (Unavail)	166.5	SV7457 Pipe Mount (Unavail)	72
SV7457 Pipe Mount (Unavail)	166.5	3 FT Dish (Unavail)	72
SV7457 Pipe Mount (Unavail)	166.5	15' x 2" Dia Omm (Unavail)	66.4
SV7457 Pipe Mount (Unavail)	166.5	15' x 2" Dia Omm (Unavail)	66.4
SV7457 Pipe Mount (Unavail)	166.5	4 Side Mount Standoff (Unavail)	37.5
Valmont 10' L-frame PN 86202 (Unavail)	168		

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	30 ksi	58 ksi

TOWER DESIGN NOTES

- TOWER DESIGN NOTES**
1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
 2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
 3. Towers are designed for a 90 mph wind.
 4. Wind loads are based upon a 90 mph wind.
 5. Voids are fabricated with 1/2" thick plate connections.
 6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
 7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
 8. Voids are fabricated with ER-70S-6 electrodes.
 9. TOWER RATING: 97.1%

Feedline Plan

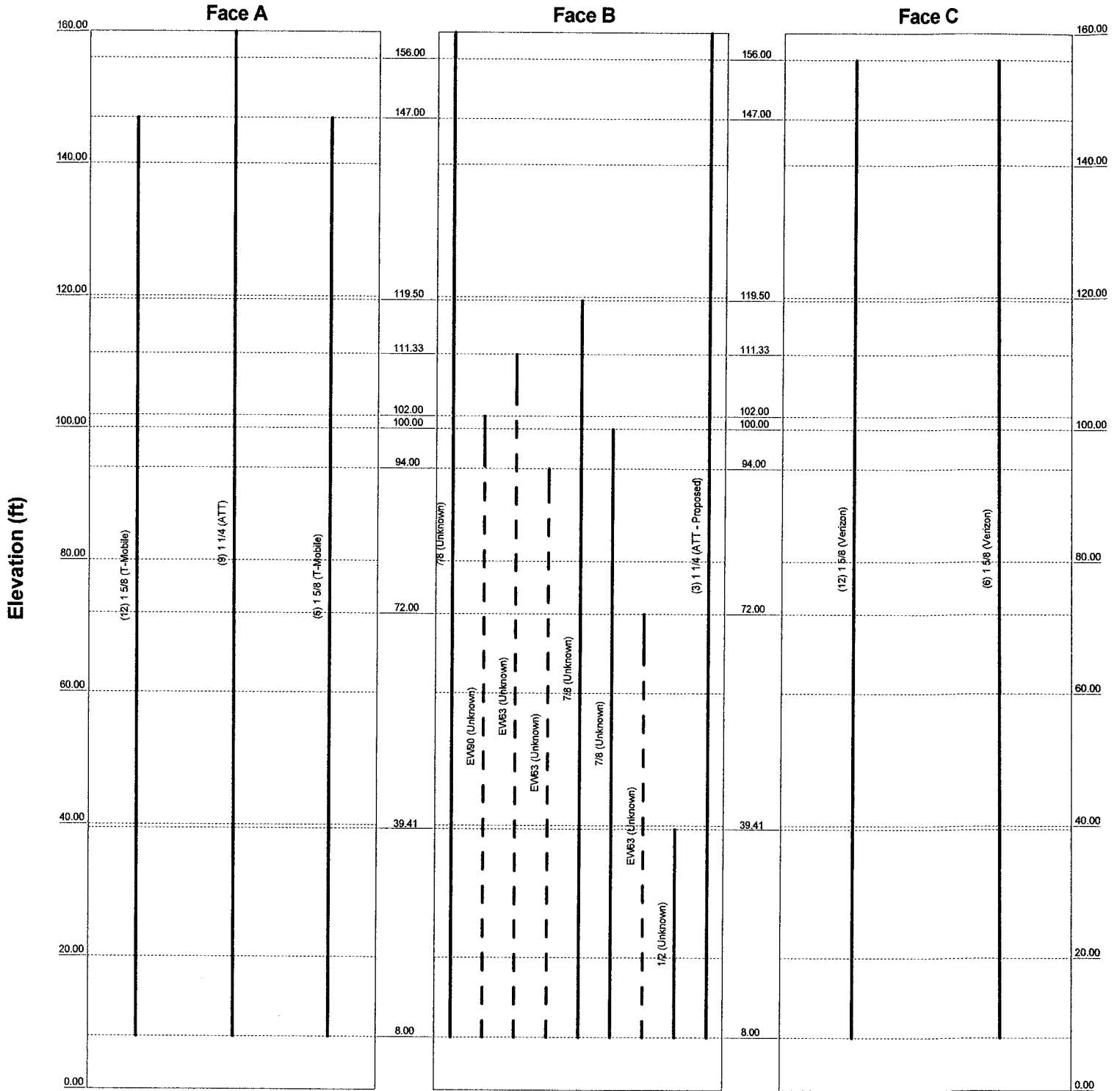


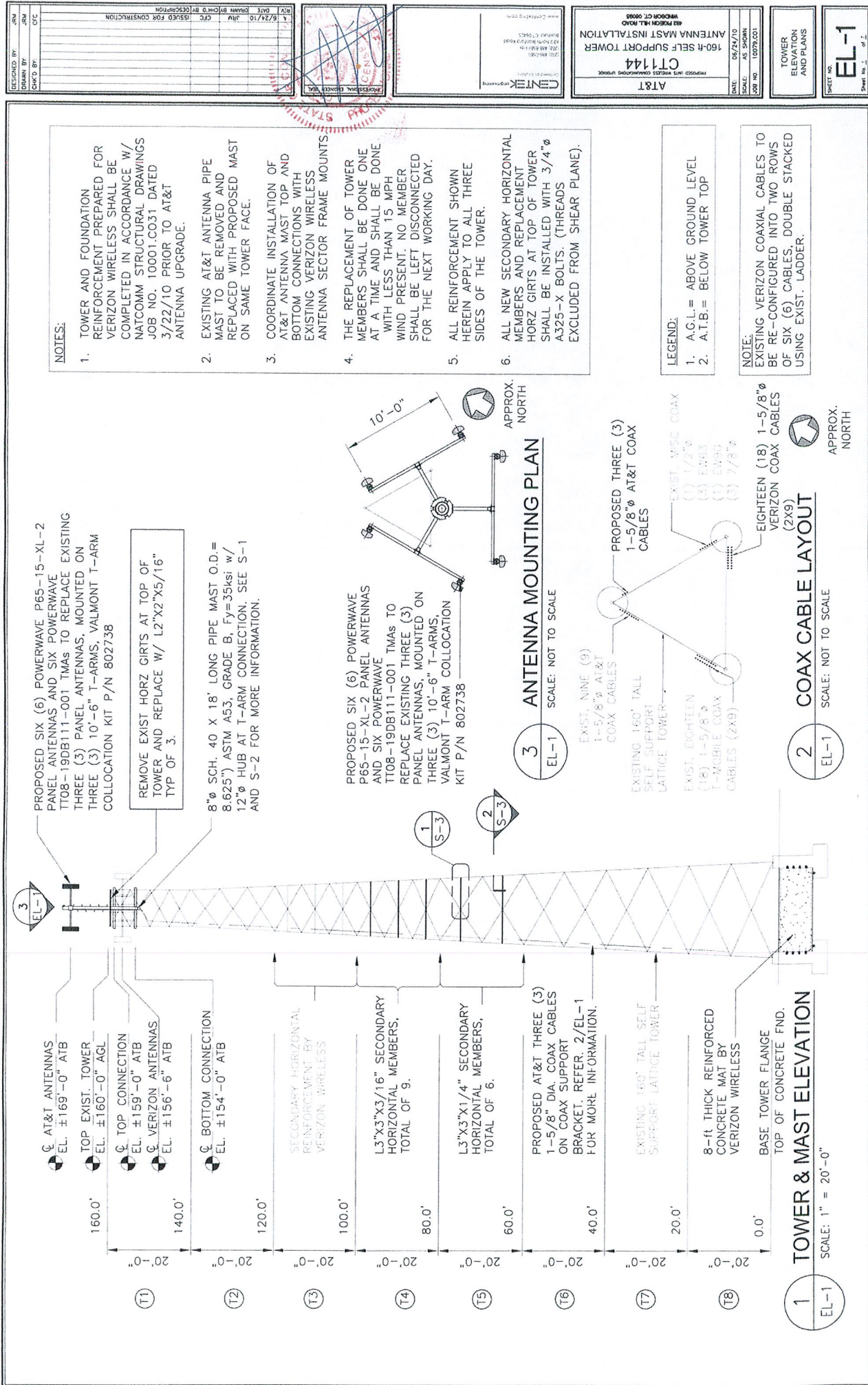
CEN TEK Engineering, Inc.		Job: 160' ROHN SSV Self-Support Lattice ~ Rev 1	
63-2 N Branford Rd		Project: 10079.CO1 - 482 Pigeon Hill Road, Windsor, CT	
Branford, CT 06405		Client: AT&T	Drawn by: Staff
Phone: (203) 488-0580		Code: TIA/EIA-222-F	Date: 06/24/10
FAX: (203) 488-8587		Path:	Scale: NTS
			Dwg No. E-7

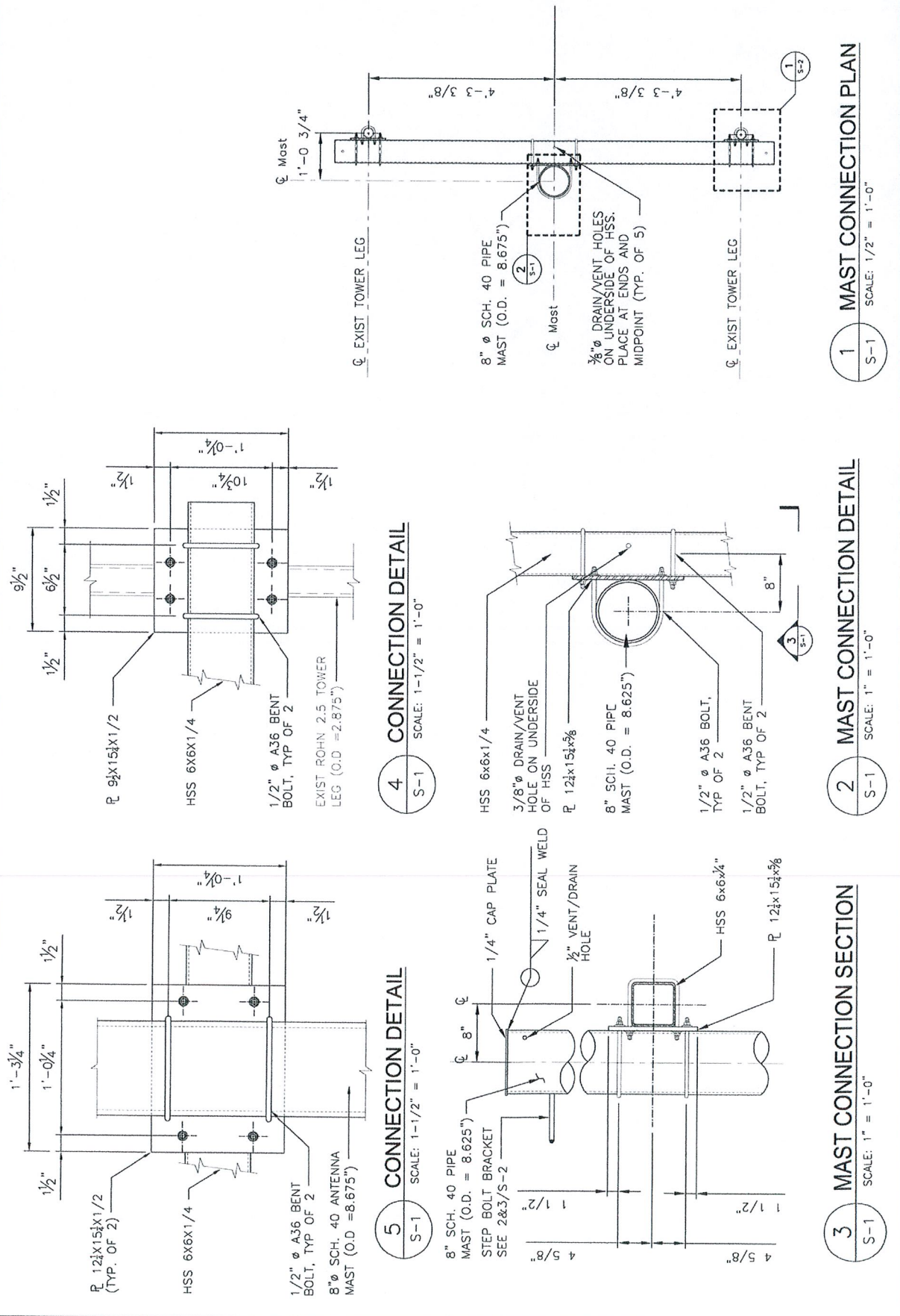
Feedline Distribution Chart

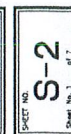
0' - 160'

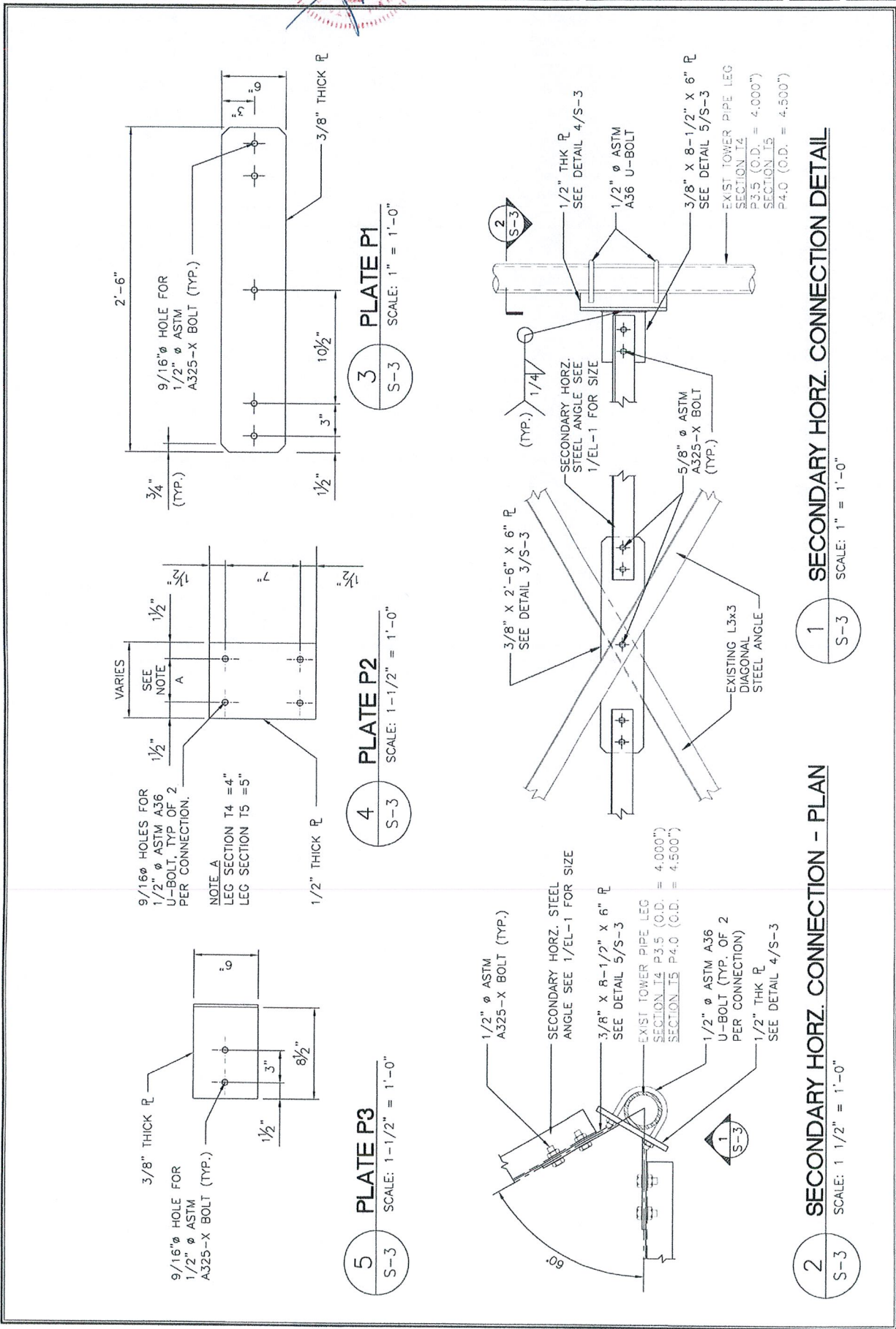
Round Flat App In Face App Out Face Truss Leg











STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

A. STRUCTURAL STEEL (W SHAPES)---ASTM A992, (FY = 50 KSI)
 B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36, (FY = 36 KSI)
 C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 E. PIPE---ASTM A53 (FY = 35 KSI)
 F. CONNECTION BOLTS---ASTM A325--N
 G. U-BOLTS---ASTM A36
 H. ANCHOR RODS---ASTM F 1554
 I. WELDING ELECTRODE---ASTM E 70XX

- ## GENERAL NOTES:

2. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH TOWER OWNER.

4. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.

3. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

0. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES:

- | | | | |
|-----|---|--|--|
| 1. | ALL WORK SHALL BE IN ACCORDANCE WITH TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES". | | DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS. |
| 2. | THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH TOWER OWNER. | | 3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION. |
| 3. | DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHALL BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORKSHEET AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS. | | 4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE. |
| 4. | THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. | | 5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE. |
| 5. | ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES. | | 6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS. |
| 6. | CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER. | | 7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780. |
| 7. | CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK. | | 8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS. |
| 8. | TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA. | | 9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE". |
| 9. | EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT. | | 10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED. |
| 10. | IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL INVEIGATE THE CAUSE AND | | 11. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW. |
| 11. | | | 12. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES. |

[illegible]

PAINT NOTES CONTINUED

PAINTING SCHEDULE:

FIRST AND SECOND COAT:

#555 OR APPROVED EQUAL.

B. TWO COATS OF DIM ACRYLIC PRIMER/FINISH (2.5-5 MILS. DRY FINISH)

C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.

2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.

2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.

3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.

4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.

5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION.
REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI-SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.

PAINT NOTES

PAINTING SCHEDULE:

1. FERROUS METAL :

A. CLEAN SURFACE IN CONFORMANCE TO SSPC-SP-3 STANDARDS, POWER TOOL CLEANING.

PRIMER: APPLY ONE SPOT COAT OF TENEMEC SERIES 1 PRIMER @ 2.5-3.0 MILS DRY.

FINISH COAT: APPLY TWO SPOT COATS OF TENEMEC SERIES 1029 (COLOR) AT 2.5 MILS PER COAT.

COLOR TO MATCH EXISTING BUILDING COLOR. OWNER TO APPROVE COLOR MATCH.

2. ZINC COATED METAL: PROVIDE THE FOLLOWING FINISH SYSTEM OVER ZINC COATED METAL:

A. SEMIGLOSS ACYCLIC-ENAMEL FINISH: 2 FINISH COATS OVER A PRIMER.

PRIMER: GALVANIZED METAL PRIMER APPLIED AT SPREADING RATE RECOMMENDED BY THE MANUFACTURER TO ACHIEVE A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 1.2 MILS. BENJAMIN MOOR IRON CLAD GALVANIZED METAL LATEX PRIMER #155 OR APPROVED EQUAL.

[illegible]

