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

VIA ELECTRONIC MAIL

December 12, 2018

Rodney Joujoute
Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
Billerica, MA 01862

RE: **EM-AT&T-166-181203** – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 1233 Wolcott Road, Wolcott, Connecticut.

Dear Mr. Joujoute:

The Connecticut Siting Council (Council) is in receipt of your correspondence of December 7, 2018 submitted in response to the Council's December 4, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/FOC/emr

Robidoux, Evan

From: Rodney Joujoute <rodney.joujoute@smartlinkllc.com>
Sent: Friday, December 07, 2018 12:21 PM
To: Robidoux, Evan
Cc: CSC-DL Siting Council; April Grasso; Sharon Keefe
Subject: RE: Council Incomplete Letter for EM-AT&T-166-181203-WolcottRoad-Wolcott
Attachments: CSC Exempt Modification Supplement Package CTL01111.pdf

Good Morning,

Please see the attached AT&T Exempt Modification Supplement Filings for the following telecommunications facility:

- CTL01111 – 1233 Wolcott Rd, Wolcott, CT06716

The hard copies will be delivered as soon as possible.

Thank You,

Rodney Joujoute | Real Estate Specialist
Smartlink

85 Rangeway Road
Bldg. #3 Suite 102
North Billerica, MA 01862

(o) 781-309-2301

smartlinkllc.com

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Proud Sponsor of the Chesapeake Bayhawks, 5-Time Major League Lacrosse Champions! www.thebayhawks.com

From: Robidoux, Evan
Sent: Thursday, December 6, 2018 11:29 AM
To: Rodney Joujoute
Cc: CSC-DL Siting Council
Subject: Council Incomplete Letter for EM-AT&T-166-181203-WolcottRoad-Wolcott

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

December 7, 2018

Melanie A. Bachman Executive
Director Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re:	**Notice of Exempt Modification – Antenna Swap and RRU Add**
Property Address:	**1233 Wolcott Rd, Wolcott, CT 06716**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

I am submitting Delivery proofs to the principal property owner, Edward Cleary at 1233 Wolcott Rd as demonstrated on the property card attached, as well as delivery proofs for the tower owner, SBA Communications Corps, the highest ranking official in Wolcott, Mayor Thomas G Dunn, as well as the highest-ranking zoning owner in Wolcott, Peter Parks, all as supplements in response to the letter written by the Connecticut Siting Council from December 4th, 2018. This submission includes all the exhibits as requested by the Connecticut Siting Council's letter dated December 4th, 2018. Please feel free to reach out if you have any questions.

Sincerely,

Rodney Joujoute

CC w/enclosures:
Mayor of Wolcott – Thomas G Dunn
Structure Owner – SBA Communications
Zoning Enforcement Office/Building Inspector – Peter Parks
Property Owner – Edward Cleary

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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www.ct.gov/csc

December 4, 2018

Rodney Joujoute
Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
Billerica, MA 01862

RE: **EM-AT&T-166-181203** – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 1233 Wolcott Road, Wolcott, Connecticut.

Dear Mr. Joujoute:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on December 3, 2018.

According to Section 16-50j-71 of the Regulations of Connecticut State Agencies, "…any modification, as defined in Section 16-50j-2a of the Regulations of Connecticut State Agencies, to an existing tower site, except as specified in Sections 16-50j-72 and 16-50j-88 of the Regulations of Connecticut State Agencies, may have a substantial adverse environmental effect."

Staff has reviewed this exempt modification request for completeness and has identified a deficiency in the request due to lack of notice. The Council issued a memorandum on June 22, 2017 to entities requesting exempt modifications requiring a copy of the entire notice and attachments be physically mailed to the chief elected official of the host municipality and the underlying property owner and proof of such mailing shall be submitted to the Council with the request for exempt modification. See attached.

The above referenced request for exempt modification lacks proof that the entire request for exempt modification was physically mailed to the underlying property owner listed in the property card as Edward F. Cleary.

Therefore, the exempt modification request is incomplete at this time. The Council recommends that Smartlink provide proof of proper notice of this exempt modification request to the underlying property owner on or before January 11, 2018. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to January 11, 2018.

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/FOC/in

Enclosures: June 22, 2017 Memo to Carriers on proof of notice.

c: The Honorable Thomas G. Dunn, Mayor, Town of Wolcott
David Kalinowski, Zoning Inspector, Town of Wolcott

STATE OF CONNECTICUT

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

VIA ELECTRONIC MAIL

MEMORANDUM

To: Telecommunications Carriers and their Representatives

From: Melanie Bachman, Executive Director MAB

Re: Exempt Modification/Tower Share Filing Notification

Date: June 22, 2017

Pursuant to Regulations of Connecticut State Agencies § 16-50j-73 and §16-50j-88, the April 2013 *Filing Guide for Modification of Existing Telecommunications Facilities*, and the August 2013 *Tower Share Filing Guide*, notice in writing shall be provided to "the Council, the property owner of record… and the chief elected official" of the intent to modify or share an existing telecommunications facility" (see Attachments).

Effective immediately, **a copy of the notice and the attachments**, including, but not limited to, engineering drawings, structural analysis (the structural analysis report without tower data and calculation appendices is sufficient) and power density calculation of the request for an exempt modification or tower share shall be physically mailed to the chief elected official of the host municipality and underlying property owner where the existing telecommunications facility is located and proof of mailing shall be submitted to the Council with the request. Proof of mailing requires an acknowledgment from the carrier (United States Postal Service or private carrier such as UPS/FedEx) that a parcel was delivered to the recipient. **E-mail service is unacceptable.**

Thank you in advance for your cooperation.

Attachments: Altrio Investment Group, LLC correspondence, dated June 16, 2017
City of Danbury email correspondence, dated June 8, 2017

MAB/FOC/laf

Recipient List:

Christopher B. Fisher, Esq., AT&T
Ray Perry, Airosmith Development, Inc.
Arthur Perkowski, Airosmith Development, Inc.
Alex Murshteyn, Centerline Communications
Michael Gentile, Centerline Communications
David Ford, Centerline Communications
Adam Wolfey, Centerline Communications
Steve Levine, Centek Engineering, Inc.
Jeff Barbadora, Crown Castle
Amanda Cornwall, Crown Castle
Kimberly Myl, Crown Castle
Donna Neal, Crown Castle
Sarah Snell, Empire Telecom
Nicole Caplan, Empire Telecom
Jack Andrews, Empire Telecom
Jennifer Iliades, Empire Telecom
Melanie Howlett, HPC Wireless
Alex Giannaras, HPC Wireless
Denise Sabo, Northeast Site Solutions
Deborah Chase, Northeast Site Solutions
Victoria Masse, Northeast Site Solutions
Mark Roberts, QC Development
Tim Burks, SAI Communications
Rick Woods, SBA
Kri Pelletier, SBA
Peter Nute, SBA
Adam Braillard, Smartlink, LLC
David Barbagallo, Smartlink LLC
Romina Kirchmaier, Smartlink LLC
Thomas J. Regan, Esq., Sprint
Sam Simons, T-Mobile
Greg Shappy, Transcend Wireless
Kyle Richers, Transcend Wireless
Jennifer Ardis, Transcend Wireless
James Burgess, TRM, Inc.
Jacqueline Clifford, TRM, Inc.
Matt Burke, TRM, Inc.
Jon Ritter, TRM, Inc.
Kenneth C. Baldwin, Esq., Verizon Wireless
Eric Dahl, Vertical Development LLC
Jamie Ford, Vertical Development LLC
Matthew Bandle, Vertical Development LLC

21 Acorn Road
Branford, CT
06405

Phone: 203-481-3496
Fax: 203-483-8804
asecondino@asecondinoandson.com

ALTRIO INVESTMENT GROUP, LLC

em-t-mobile-014-170523

June 16, 2017

Ms. Amanda Cornwall
Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

RE: T-Mobile Tower Modifications, 21 Acorn Road, Branford CT
Reference Site # CTNH509A

Dear Ms. Cornwall,

Please provide Altrio Investment Group (*Landlord and Property Owner*) with all pertinent documentation and information regarding modifications to the subject communication tower or ground lease area including structural analysis report, modification drawings, structural drawings, and drawings indicating T-Mobile equipment plans and elevations.

Please also notify all involved parties that any holes or penetrations in the building envelope are to be performed by the Landlord, Altrio Investment Group LLC and will be billed to the responsible parties.

Best regards,

Alfred J. Secondino

Alfred J. Secondino
Managing Member

CC: Melanie A Bachman, CT Siting Council, Executive Director
File

Cunliffe, Fred

From: Bachman, Melanie
Sent: Thursday, June 08, 2017 3:35 PM
To: 'Deborah Chase'
Cc: 'Sheldon Freincle'; 'Denise Sabo'; 'Victoria Masse'
Subject: RE: 41 Padanaram Road, Danbury CT 06811 (CT11896A L1900) T-Mobile Antenna EM Application

Good afternoon.

I received a call from Robin Edwards, Corporation Counsel for the City of Danbury. She was concerned about how notice of this request was provided to the City and indicated that it appeared the request was submitted through their "311 service?" From their website, this appears to be a City Service Request Form. I snipped the link to it below for your convenience. The cover letter indicates that a copy was sent to the Mayor and the Director of Planning. Could someone please confirm that a copy of the letter was actually sent rather than submitted to the "311 service" when you have a chance?

Thanks.

Resources

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051
860-827-2951

From: Deborah Chase [mailto:deborah@northeastsitesolutions.com]
Sent: Friday, May 26, 2017 3:12 PM
To: CSC-DL Siting Council <Siting.Council@ct.gov>; Bachman, Melanie <Melanie.Bachman@ct.gov>; Mathews, Lisa A <Lisa.A.Mathews@ct.gov>
Cc: Sheldon Freincle <sheldon@northeastsitesolutions.com>; Denise Sabo <denise@northeastsitesolutions.com>; Victoria Masse <victoria@northeastsitesolutions.com>
Subject: 41 Padanaram Road, Danbury CT 06811 (CT11896A L1900) T-Mobile Antenna EM Application

Siting Council,

Enclosed please find the Notice of Exempt Modification package from Northeast Site Solutions on behalf of T-Mobile in connection with the above-referenced site.

We are mailing the original and two (2) copies to your office.

Please let me know if you have any questions or problems with the attachment.

Sincerely,

Deborah Chase
Senior Project Coordinator & Analyst
Mobile: 860-490-8839

NSS
NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Save a tree. Reduce. Reuse. Recycle.

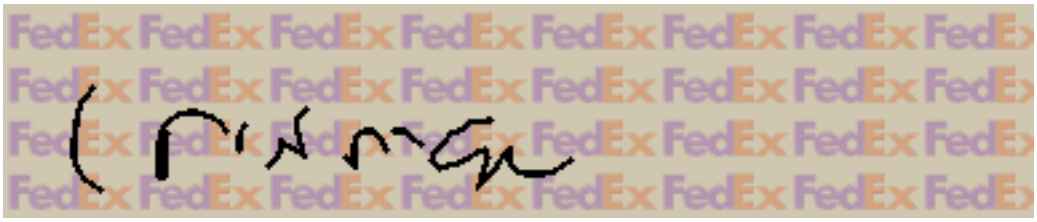
December 7,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773902235951**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	C.NORMAN	**Delivery location:**	50 BEACH RD WOLCOTT, CT 06716
Service type:	FedEx First Overnight	**Delivery date:**	Dec 7, 2018 08:28
Special Handling:	Deliver Weekday No Signature Required		



Shipping Information:

Tracking number:	773902235951	**Ship date:**	Dec 6, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Edward Cleary
50 Beach Rd
WOLCOTT, CT 06716 US

Shipper:
Rodney Joujoute
Smartlink LLC
85 Rangeway Road
Bldg. 3 - Suite 102
North Billerica, MA 01862 US

Thank you for choosing FedEx.

November 30,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773842649283**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Guard/Security Station
Signed for by:	M.WALTER	**Delivery location:**	8051 CONGRESS AVENUE BOCA RATON, FL 33487
Service type:	FedEx First Overnight	**Delivery date:**	Nov 30, 2018 08:05
Special Handling:	Deliver Weekday No Signature Required		

Shipping Information:

Tracking number:	773842649283	**Ship date:**	Nov 29, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Carla Shorter
SBA Communications Corp.
8051 Congress Avenue
BOCA RATON, FL 33487 US

Shipper:
Rodney Joujoute
Smartlink LLC
85 Rangeway Road
Bldg. 3 - Suite 102
North Billerica, MA 01862 US

Reference
MAL05057/10072394

Thank you for choosing FedEx.

November 30,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773842614197**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	E.HENDERSON	**Delivery location:**	10 KENEA AVE WOLCOTT, CT 06716
Service type:	FedEx First Overnight	**Delivery date:**	Nov 30, 2018 09:20
Special Handling:	Deliver Weekday No Signature Required		

Shipping Information:

Tracking number:	773842614197	**Ship date:**	Nov 29, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Thomas G Dunn
Wolcott Town Hall
10 Kenea Ave
WOLCOTT, CT 06716 US

Shipper:
Rodney Joujoute
Smartlink LLC
85 Rangeway Road
Bldg. 3 - Suite 102
North Billerica, MA 01862 US

Thank you for choosing FedEx.

November 30,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773842693496**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	E.HENDERSON	**Delivery location:**	10 KENEA AVE WOLCOTT, CT 06716
Service type:	FedEx First Overnight	**Delivery date:**	Nov 30, 2018 09:20
Special Handling:	Deliver Weekday No Signature Required		

Shipping Information:

Tracking number:	773842693496	**Ship date:**	Nov 29, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Peter Parks
Wolcott Town Hall
10 Kenea Avenue
WOLCOTT, CT 06716 US

Shipper:
Rodney Joujoute
Smartlink LLC
85 Rangeway Road
Bldg. 3 - Suite 102
North Billerica, MA 01862 US

Thank you for choosing FedEx.

November 28th, 2018

Melanie A. Bachman
Executive Director
Connecticut Siting Council 10
Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
Property Address: **1233 Wolcott Rd, Wolcott, CT 06716**
Applicant: **AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 188-feet on an existing 350 - foot self-support tower, owned by SBA Communications Corporation at 8051 Congress Avenue, Boca Raton, FL 33487. AT&T now intends to remove (3) KMW AM-X-CD16-65-00T-RET panel antennas from position 4 all sectors, while retaining one (1) KMW AM-X-CD16-65-00T-RET panel antenna on Position 1 sector A, and two (2) Power wave 800-10121 panel antennas on Position 1, sectors B and C. Swapping three (3) CCI products HPA-65R-BUU-H6 panel antennas from position 2 to position 4 all sectors and install three (3) KMW EPBQ-654L8H8-L2 position 3, all sectors (for a total of (9) panel antennas), at the 188-foot level. AT&T also intends to install one (1) DC-6 Squid only surge suppressor, (2) DC-6 fiber squid surge suppressor, three (3) RRUS-32's, three (3) RRUS-4478 B5, three (3) RRUS-4426 B66 on the existing antenna masts. Inside AT& T's shelter, AT&T proposes to swap the DUS with a 5216, add a second XMU as well as add an RBS 6630.

This facility was approved the Application for a zoning permit # 3024 on November 22, 1991 by the Wolcott Planning and Zoning Commission granting a certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of telecommunications antennas, associated equipment, and building to provide Domestic Public Cellular radio Telecommunication service in the Connecticut- New England area. This approval included the following original conditions, including the total facility height or mounting restrictions. This modification complies with the aforementioned conditions

1. Site plan and special permits approved by the Planning and Zoning Commission and variances granted by the Zoning Board of Appeals may have been approved or granted subject to conditions, which conditions are also conditions of approval of the zoning permit.
2. After completion of any construction and any improvements and prior to the use occupancy of the premises, a Certificate of Zoning Compliance must be obtained. Such Certificate of Zoning Compliance must also be obtained prior to any change of use of an existing premise. SEE ATTACHED.

The following is a list of subsequent decisions by the Connecticut Siting Council: **EM-AT&T-166-020626**, **EM-CING-166-040121, EM-CING-132-134-152-165-166-070726, EM-AT&T-166-120601, EM-CING-166-140826, EM-AT&T-166-170712,**

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73,

for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Mayor - Thomas G. Dunn and Zoning Inspector – Peter Parks Town Hall 10 Kenea Ave. Wolcott, CT 06716. A copy of this letter is also being sent to Sba Communications Corp 8051 Congress Ave Boca Raton, Fl 33487

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 188-foot level of the 350-foot self-support tower. .
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A. §16-50j-72(b) (2).

Sincerely,

Rodney Joujoute

Enclosures
CC w/enclosures:

Mayor of Wolcott – Thomas G Dunn
Structure Owner – SBA Communications
Peter Parks – Zoning Enforcement Office/Building Inspector

SITESAFE
RF COMPLIANCE EXPERTS

8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

Smartlink on behalf of AT&T Mobility, LLC
Site FA – 10041812
Site ID – CT1111 (MRCTB018352-MRCTB032155-MRCTB032159)
USID – 26036
Site Name – Wolcott-North

1233 Wolcott Road
Wolcott, CT 06716

Latitude: N41-37-17.66
Longitude: W72-58-25.08
Structure Type: Self-Support

Report generated date: August 21, 2018
Report by: Leo Romero
Customer Contact: Haleluya Haile

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant
Optional AT&T Mitigation Items?	No

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTV1111_2018-LTE-Next-Carrier_LTE_om636a_2051A066KI_10041812_26036_03-14-2018_Final-Approved_v1.00

CD's: 10041812_AE201_180709_CTL01111_Rev 0_3C-4C5C.JMRL_HHRL

RF Powers Used: RFDS ERP Values

1.2 Signage Summary

AT&T Signage Locations	 Information 1	 Information 2	 Notice	 Notice 2	 Caution	 Caution 2	 Warning	 Warning 2	 Barriers
Access Point(s)	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	
Alpha	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	
Beta	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	
Gamma	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐[#]	☐

1.3 Fall Arrest Anchor Point Summary

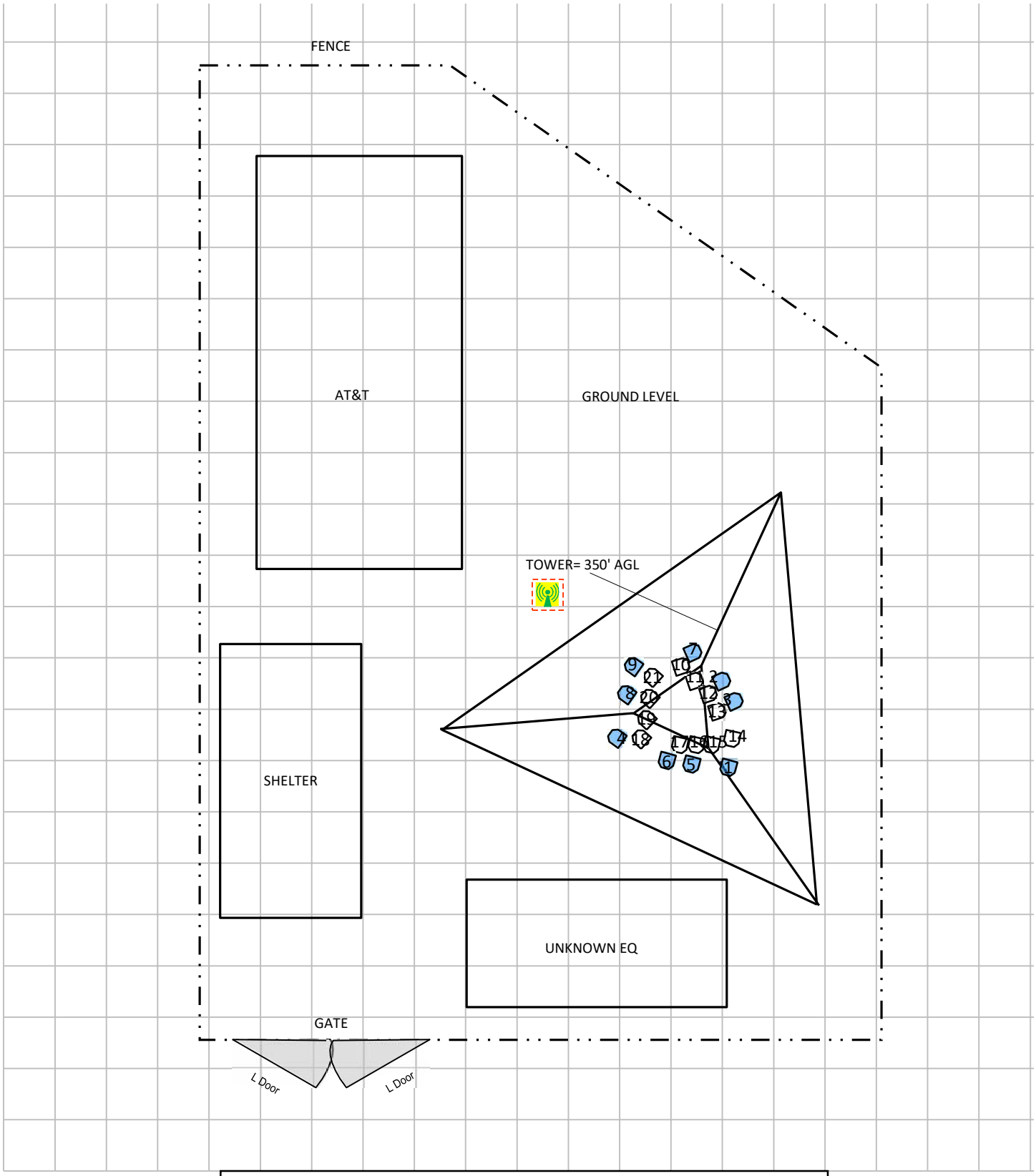
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	N/A	N

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- AT&T Mobility, LLC Contribution
- RF Exposure Diagram – Elevation View

Site Scale Map For: Wolcott-North



(Feet)

0 5 10

www.sitesafe.com
Site Name:Wolcott-North
8/21/2018 3:51:16 PM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Warning 2 | Info 1 | Info 2 | RF Safety Plan

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	850	153	63	6	13.86	1	0	233.9	50.6'	47.7'	182'
2	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	850	23	67	7.6	13.76	0	1	500	50.1'	54'	181.2'
2	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	5G 850	23	67	7.6	13.76	0	1	500	50.1'	54'	181.2'
2	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	1900	23	62	7.6	15.16	0	1	4842	50.1'	54'	181.2'
2	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	2100	23	60	7.6	15.36	0	1	5070.3	50.1'	54'	181.2'
3	AT&T MOBILITY LLC	Cci Antennas HPA-65R-BUU-H6	Panel	737	23	66.2	6	11.68	0	1	1475.7	51'	52.6'	182'
3	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	2300	23	61.1	6	14.53	0	1	1285.3	51'	52.6'	182'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	263	87.6	4.5	11.35	1	0	169.4	42.4'	49.9'	182.7'
5	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	850	153	67	7.6	13.76	0	1	500	47.9'	47.9'	181.2'
5	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	5G 850	153	67	7.6	13.76	0	1	500	47.9'	47.9'	181.2'
5	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	1900	153	62	7.6	15.16	0	1	4842	47.9'	47.9'	181.2'
5	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	2100	153	60	7.6	15.36	0	1	5070.3	47.9'	47.9'	181.2'
6	AT&T MOBILITY LLC	Cci Antennas HPA-65R-BUU-H6	Panel	737	153	66.2	6	11.68	0	1	1475.7	46.1'	48.2'	182'
6	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	2300	153	61.1	6	14.53	0	1	1285.3	46.1'	48.2'	182'
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	23	87.6	4.5	11.35	1	0	134.6	48'	56.1'	182.7'
8	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	850	263	67	7.6	13.76	0	1	500	43.1'	53.1'	181.2'
8	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	5G 850	263	67	7.6	13.76	0	1	500	43.1'	53.1'	181.2'
8	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	1900	263	62	7.6	15.16	0	1	4842	43.1'	53.1'	181.2'
8	AT&T MOBILITY LLC (Proposed)	KMW EPBQ-654L8H8	Panel	2100	263	60	7.6	15.36	0	1	5070.3	43.1'	53.1'	181.2'
9	AT&T MOBILITY LLC	Cci Antennas HPA-65R-BUU-H6	Panel	737	263	66.2	6	11.68	0	1	1475.7	43.6'	55.1'	182'
9	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	2300	263	61.1	6	14.53	0	1	1285.3	43.6'	55.1'	182'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
10	UNKNOWN CARRIER	Generic Panel	Panel	850	30	65	4.6	12.77	-	-	1513.9	47.2'	55.1'	197.7'
11	UNKNOWN CARRIER	Generic Panel	Panel	1900	30	65	4.6	15.43	-	-	2094.8	48.2'	54'	197.7'
12	UNKNOWN CARRIER	Generic Panel	Panel	2100	30	65	4.6	15.23	-	-	2000.6	49.2'	53.1'	197.7'
13	UNKNOWN CARRIER	Generic Panel	Panel	751	30	65	4.6	12.14	-	-	982.1	49.8'	51.8'	197.7'
14	UNKNOWN CARRIER	Generic Panel	Panel	850	150	65	4.6	12.77	-	-	1513.9	50.9'	49.8'	197.7'
15	UNKNOWN CARRIER	Generic Panel	Panel	1900	150	65	4.6	15.43	-	-	2094.8	49.4'	49.3'	197.7'
16	UNKNOWN CARRIER	Generic Panel	Panel	2100	150	65	4.6	15.23	-	-	2000.6	48.3'	49.3'	197.7'
17	UNKNOWN CARRIER	Generic Panel	Panel	751	150	65	4.6	12.14	-	-	982.1	47.1'	49.3'	197.7'
18	UNKNOWN CARRIER	Generic Panel	Panel	850	270	65	4.6	12.77	-	-	1513.9	44.2'	49.8'	197.7'
19	UNKNOWN CARRIER	Generic Panel	Panel	1900	270	65	4.6	15.43	-	-	2094.8	44.6'	51.2'	197.7'
20	UNKNOWN CARRIER	Generic Panel	Panel	2100	270	65	4.6	15.23	-	-	2000.6	44.8'	52.8'	197.7'
21	UNKNOWN CARRIER	Generic Panel	Panel	751	270	65	4.6	12.14	-	-	982.1	45.1'	54.3'	197.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above the ground level (AGL).** The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline**.** Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

Note: The 2300MHz LTE technology is being added to an existing antenna.

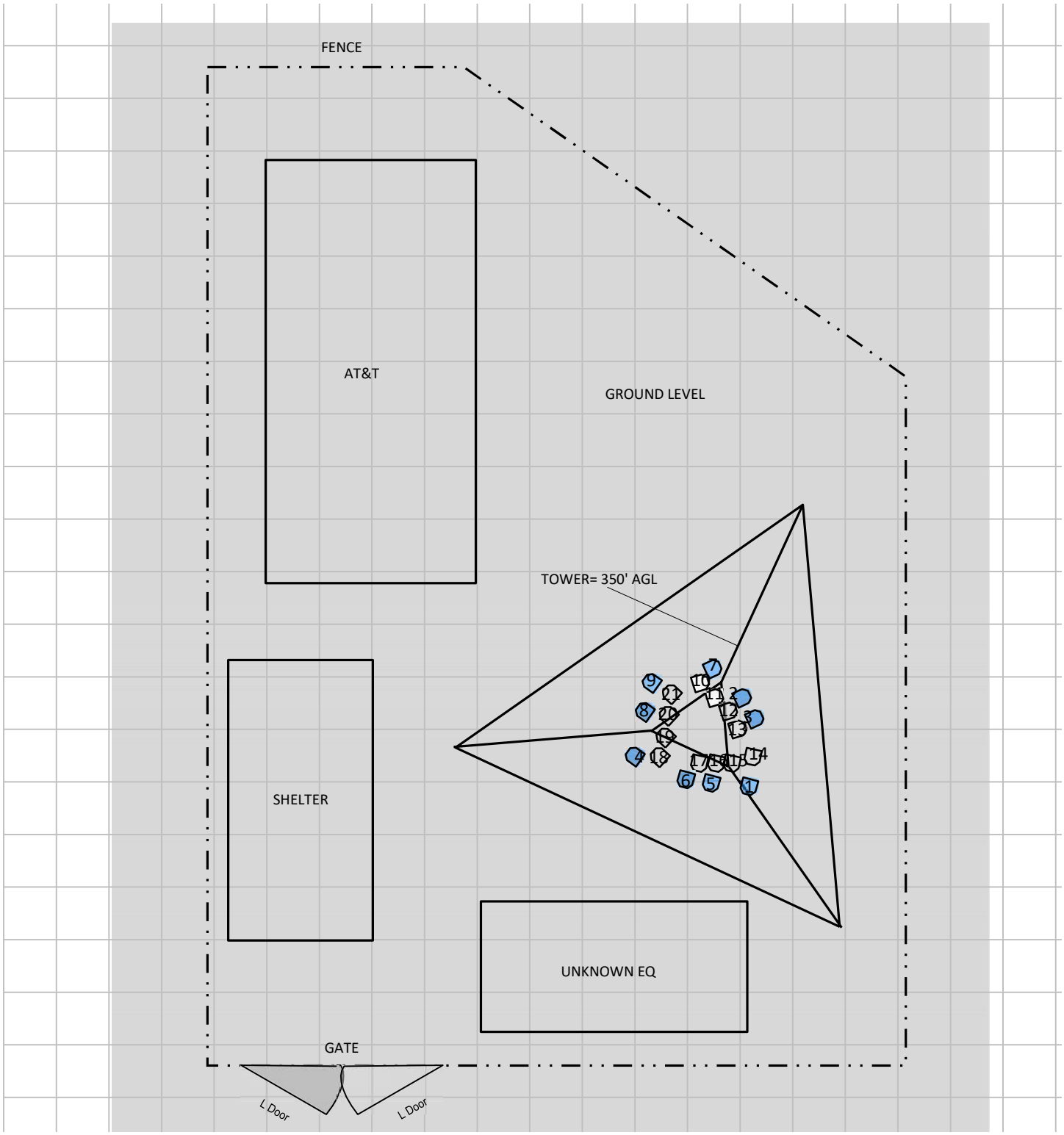
4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas. The total analyzed elevations in the below RF Exposure Simulations are listed below.

- Ground Level = 0'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Wolcott-North



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit
>= 5000 | >= 500 | >= 100 | >= 5 | < 5

Carrier Identification
AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

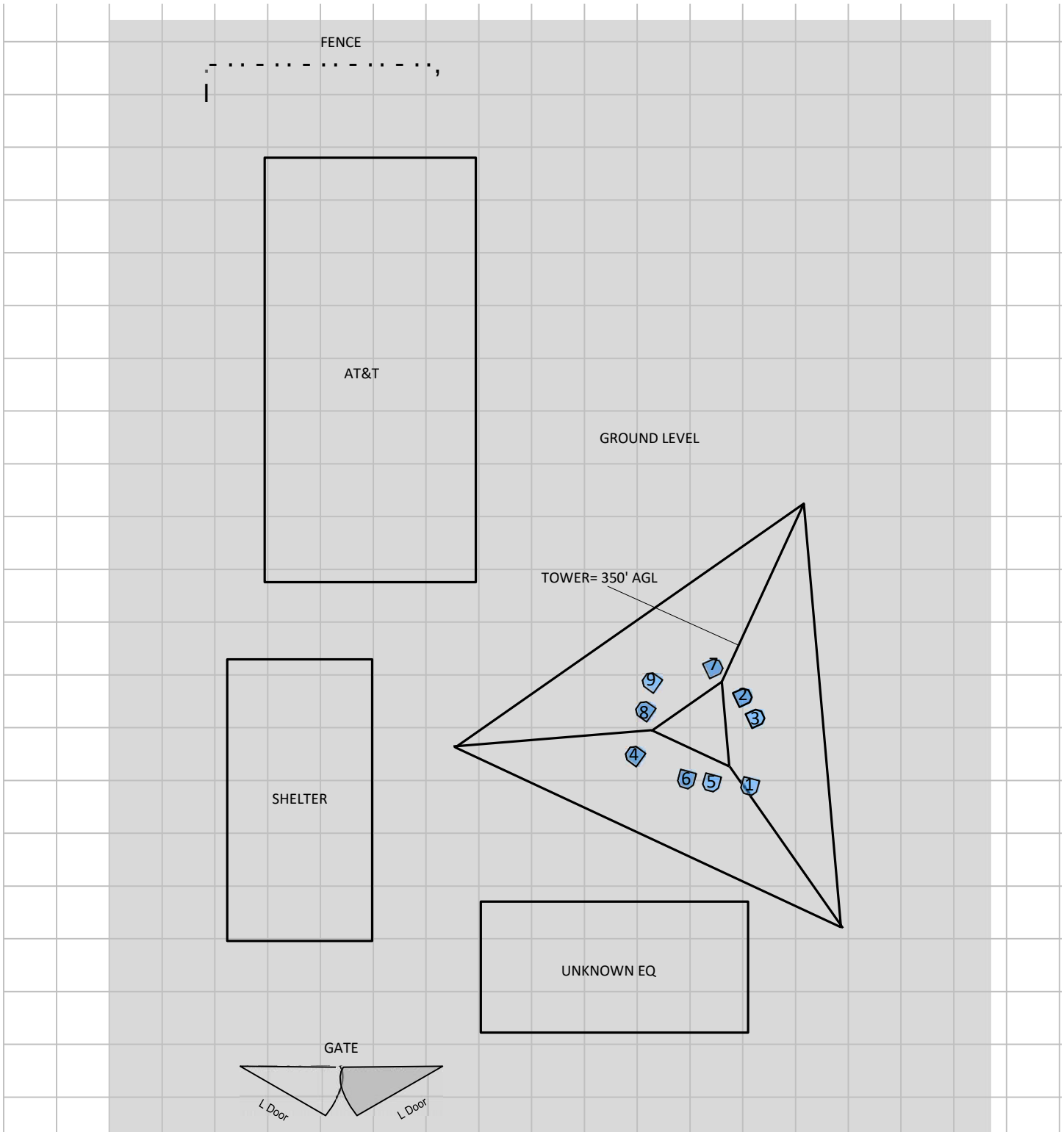
(Feet)

0 5.3 10.7

www.sitesafe.com
Site Name:Wolcott-North
8/21/2018 3:48:44 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Wolcott-North
AT&T Mobility, LLC Contribution



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit
>= 5000 | >= 500 | >= 100 | >= 5 | < 5

Carrier Identification
AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

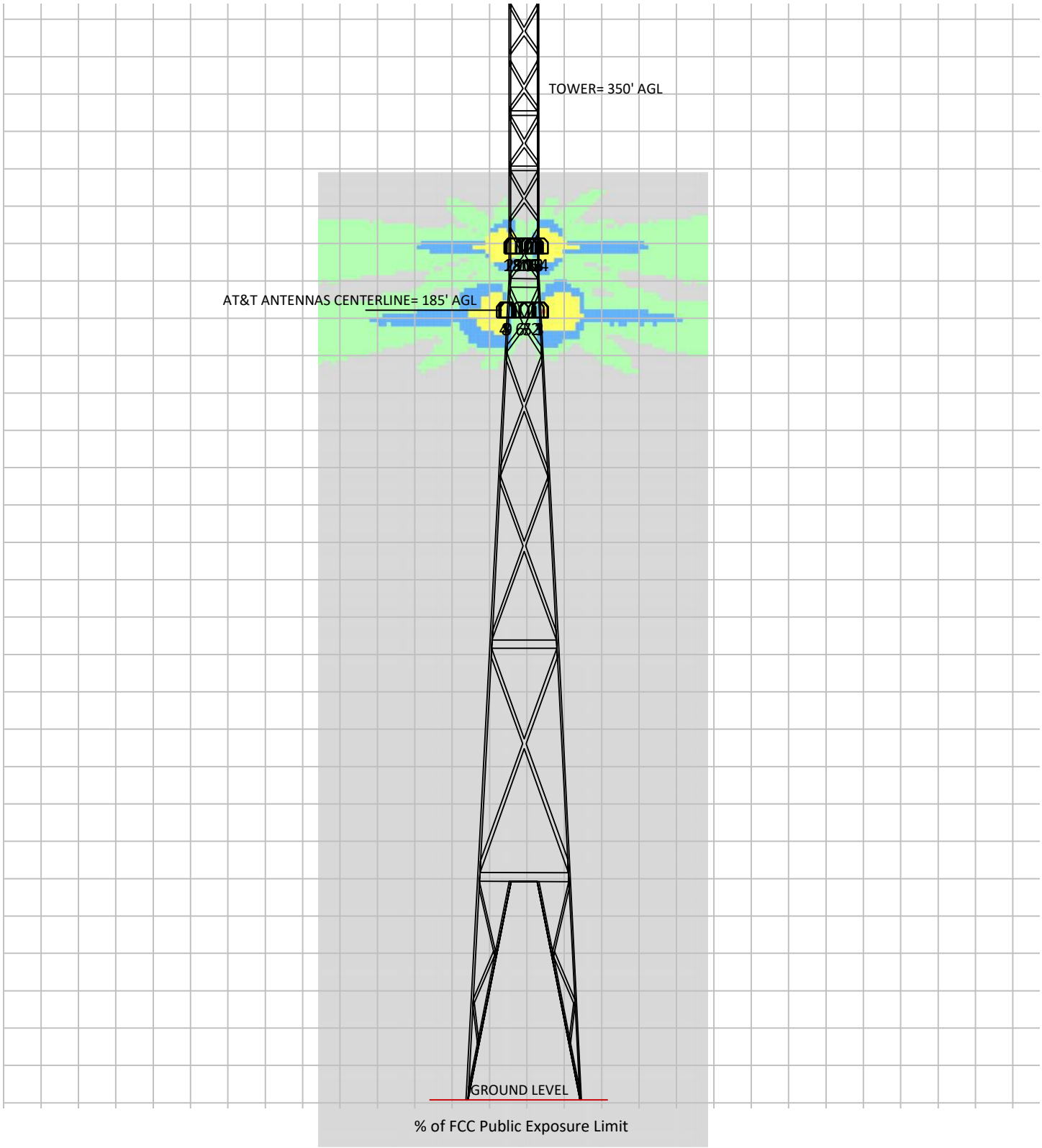
Proposed Barriers/ Signs

(Feet)
0 5.3 10.6

www.sitesafe.com
Site Name:Wolcott-North
8/21/2018 3:49:37 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Wolcott-North
Elevation View



% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

(Feet)

0 17.2 34.4

www.sitesafe.com
Site Name:Wolcott-North
8/21/2018 3:56:12 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section **5.2** or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

All TowerAccess Locations

Install a Caution 2B sign.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, LLC., in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Leo Romero.

August 21, 2018

Young Min Kim

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

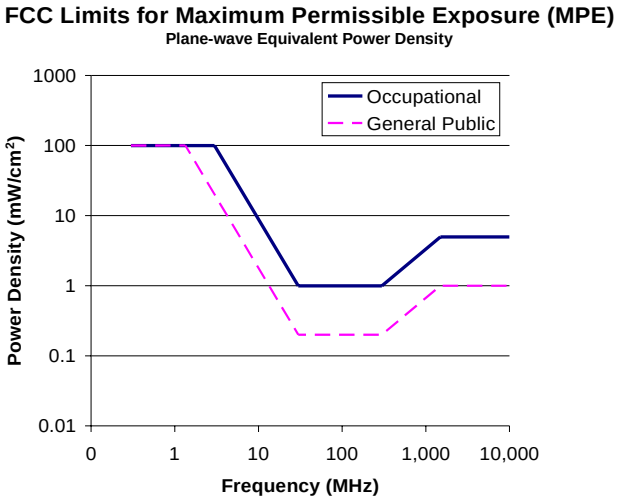
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and healthstandards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. Gray represents areas more than 20 times below the most conservative exposure limit.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, LLC.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

ALLPRO
CONSULTING GROUP, INC.
9221 Lyndon B. Johnson Freeway, #204, Dallas, TX 75243 ★ PHONE 972-231-8893 ★ FAX 1-866-364-8375
www.allprocgi.com ★ e-mail: info@allprocgi.com

Tower Structural Analysis Report for
SBA Network Services, Inc.

Existing 350' Self Support Tower

SBA Site Name: Cleary Tower (Edward)
SBA Site ID: CT20021-A-08
Carrier Name: AT&T
Carrier Site ID/Name: CTL01111 / Walcot
App # 92366, v1

Site Location: 1233 Wolcott Road (Rt-69)
Wolcott, CT 06716
New Haven County
Latitude: 41.621581°
Longitude: -72.973633°

ACGI Job # 18-7241
(Refer to Previous ACGI Job # 18-5441, dated 08/22/2018)

ANALYSIS RESULTS		
Tower Components	**99.9 %**	**Pass**
Tower Foundation	**42.6 %**	**Pass**
Net change in tower stress	**+1.5 %**	**Change from previous SA by Allpro Consulting Group, Inc. ACGI # 18-5441 dated 08/22/2018.**

Prepared By:
Bob Akech
Staff Engineer

11/02/2018
Approved By:
Joji M. George, P.E.
CT PE # 24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 350' Self-Supported Tower located in Wolcott, Connecticut was analyzed by Allpro Consulting Group, Inc. (ACGI) for the existing loads and the proposed AT&T antennas, dishes and coaxes per application # 92366, v1 as authorized by SBA Communication Corp. Based on the results of the analysis, the existing tower with below mentioned proposed and existing loading is found to be **in compliance** with *TIA-222-G*, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and International Building Code 2012*.

2. SCOPE & SOURCE OF INFORMATION

The purpose of this structural analysis is to determine whether the existing structure is capable of supporting additional proposed loads.

SOURCE OF INFORMATION		
Tower Data:	Paul J. Ford & Co. FDH Engineering Allpro Consulting Group, Inc.	Structural analysis by Paul J. Ford & Co., Job No. A03-T143 dated 12/22/2003. Previous structural analysis by FDH Engineering, project # 1462GQ1400, dated 04/09/2014. Previous structural analysis by Allpro Consulting Group, Inc., ACGI Job # 16-4376, dated 12/14/2016. Previous modification design by Allpro Consulting Group, Inc., ACG I # 17-0832 Rev.2 dated 07/14/2017. Previous Structural Analysis by Allpro Consulting Group, Inc., ACGI # 18-5441 dated 08/22/2018.
Foundation Data:	Paul J. Ford & Co.	Structural analysis by Paul J. Ford & Co., Job No. A03-T143 dated 12/22/2003.
Geotechnical Report:	Osman Pekin	Soil report by Osman Pekin, Ph.D., P.E. dated 12/12/1991.
Loading Data:	Allpro Consulting Group, Inc. sbasite.com	Previous Structural Analysis by Allpro Consulting Group, Inc., ACGI # 18-5441 dated 08/22/2018 SBA site summary dated 7/26/2018. Proposed final loading for AT&T as per sbasite.com, Application ID 92366, v1.
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA-222-G-Addendum 2. The tower was modeled using TNX Tower, a 3-D finite element program. TNX Tower is a general-purpose modeling, analysis, and design program created specifically for communication towers using the EIA-222-C, EIA-222-D, TIA/EIA-222-F or TIA-222-G standards. The 3-D model included the tower, with existing appurtenances and all proposed loads.

SITE DATA	
SBA Site Name:	Cleary Tower (Edward)
SBA Site Number:	CT20021-A-08
Carrier Site Name:	AT&T: CT01111 / Walcott
City, State:	Wolcott, CT
County:	New Haven
Code Wind Load Requirement:	TIA-222-G & 2012 International Building Code (Ultimate wind speed of 125 mph 3 sec gust equivalent to Nominal design wind speed of 97 mph)
Wind Load Used:	TIA-222-G Code: • Nominal wind speed of 97 mph (3 second gust wind speed) • Structure Class II*. • Exposure Category B. • Topographic Category 1. • A wind speed of 50 mph is used in combination with 0.75 in ice thickness.
Seismic Check:	Spectral Response Acceleration at Short Period (Ss) is 0.186 g which less than 1.000 g. Therefore, no seismic check is required as per TIA-222-G section 2.7.3

*This structural analysis is based upon the tower being classified as a class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

TOWER DATA	
Tower Type:	Self-Supported Tower
Height:	350'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi, Braces – 36ksi
Type of Foundation:	Pad and Pier Foundation

TOWER HISTORY	
Tower Manufacturer / Model:	FWT, Inc.
Date of Original Design:	1992
Previous Modifications:	Previous modification design by Allpro Consulting Group, Inc., ACGI#17-0832 Rev.2 dated 07/14/2017.
Original Design Code Reqts:	EIA/TIA 222-E, 85mph basic wind speed without ice and 74 mph basic wind speed with 0.5" thick ice

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	*% Capacity*	*Pass/Fail*
Leg	**46.0 %**	**Pass**
Diagonal	**53.4 %**	**Pass**
Horizontal	**51.0 %**	**Pass**
Top Girt	**3.2 %**	**Pass**
Redundant Horizontal Bracing	**99.9 %**	**Pass**
Redundant Diagonal Bracing	**70.4 %**	**Pass**
Inner Bracing	**0.9 %**	**Pass**
Bolts	**49.5 %**	**Pass**
Anchor Bolts	**47.6 %**	**Pass**
OVERALL TOWER RATING = 99.9 % (Pass)		

Foundation Type	*Reaction Direction*	*Current Analysis Reaction (TIA-222-G)*	*Original Design Reaction (EIA/TIA-222-E)*	*Original Design Reaction equivalent to TIA-222-G (multiply by 1.35)*	*% Capacity*
Individual Foundation	**Uplift**	**316 k**	**631 k**	**851.8 k**	**37.1 %**
	Compression	**432 k**	**751 k**	**1013.8 k**	**42.6 %**

**Note: Soil data available as per Soil report by Osman Pekin, Ph.D., P.E. dated 12/12/1991 is not sufficient for the detail analysis of the foundation. Therefore, reactions are compared based upon the original tower design. Foundation is estimated to be acceptable based on the tower member loads and stresses. However, it is recommended to provide detailed geotechnical investigation report for rigorous analysis of the tower foundation.*

MAXIMUM DISH ROTATION AT SERVICE WIND SPEED Twist and Sway (deg), 10 dB degradation limit*				
Elev. (ft)	*MW Dish*	*Tilt (deg)*	*Twist (deg)*	*Allowable (deg)*
165±	**SPD3-2.4**	**0.0680**	**0.0042**	**Carrier to verify**

As per the results of the analysis, the existing tower **is in code compliance** for the proposed and existing antenna loads.

Maximum tower member stress **is less than allowable, making it in code compliance** under the TIA-222-G code and International Building Code 2012 requirements.

Overall tower stress ratio increased by 1.5 % compared to previous SA by Allpro Consulting Group, Inc. ACG I# 18-5441 dated 08/22/2018 due to increase of AT&T loading.

5. ASSUMPTIONS

This analysis was completed based on the following assumptions:

- Tower has been properly maintained
- Tower erection was in accordance to manufacturer drawings
- Leg flanges have been properly designed by manufacturer to not be a limiting reaction
- Welds have been properly designed and installed by manufacturer to not be a limiting reaction
- Foundation was constructed in accordance to manufacturer drawings
- Foundation does not have structural damage
- Bolts have been properly tightened according to manufacturer specifications
- Appurtenance, mount and transmission line sizes and weights are best estimates using the tnxTower database and manufacturer information

6. DISCLAIMER

Installation procedures and related loading are not within the scope of this analysis. A contractor experienced in similar work should perform all installation work. The engineering services provided by Allpro Consulting Group, Inc. (ACGI) are limited to the computer analysis and calculations of the structure with the proposed and existing loads. This analysis is considered void if the loading mentioned in this report is changed or is different as installed. It is assumed that the existing structure is properly maintained and is in good condition free of any defects. Scope of this analysis does not include existing connections, except as noted in this report.

ACGI does not make any warranties, expressed or implied in connection with this engineering analysis report and disclaims any liability arising from deficiencies or any existing conditions of the original structure. ACGI will not be responsible for consequential or incidental damages sustained by any parties as a result of any data or conclusions included in this Report. The maximum liability of ACGI pursuant to this report shall be limited to the consulting fee received for the preparation of the report.

7. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
350±	1	Celwave PD200 Omni	(1) Star Mount w/ (9) Standoffs	(1) 7/8"	LoJack
350±	1	101 Omni		(1) 1 1/4"	Marcus
341±	3	Kathrein 800 10622 Antenna	(3) Commscope SF-SU7-2-96 Sector Frame	(1) 1-1/4" Hybrid	Dish Network
	3	Ericsson 4415 Radio			
	3	Ericsson 0208 Radio			
320±	2	101 Omni	(2) 6' Standoffs	(2) 1 1/4"	Marcus
186±	3	Powerwave 7770 Antenna	(3) 13.5' T-Frames	(12) 1-5/8" (2) 3/4" DC Power (1) 1/2" Fiber [DC Power & Fiber inside 2" interduct]	AT&T
	4	KMW AM-X-CD-16-65-00T-RET Antenna			
	2	Kathrein 800 10121 Antenna			
	3	CCI HPA-65R-BUU-H6 Antenna			
	6	CCI DTMABP7819VG12A TMA			
	4	Kathrein 860 10025 RET			
	3	Ericsson RRUS 11 Remote Radio			
	3	Ericsson RRUS 32 Remote Radio			
	6	Powerwave LGP 13519 Diplexer			
	1	Raycap DC6-48-60-18-8F Surge			
165±	3	SPD3-2.4 Radiowaves Dish	Pipe Mount	(6) 1/2"	Marcus
	3	SPD2-5.8 Radiowaves Dish	Pipe Mount		
158±	1	Decibel DB408 Omni	(1) 17" Standoff	(1) 7/8"	Wolcott
134±	3	APXVTM14-C-I20	(3) 15' T-Frames	(4) 1-1/4"	Sprint
	3	RFS APXVSPP18			
	3	RRH 1900 MHz			
	3	RRH 800 MHz			
	3	RRH TD-8x20-25			
	3	RRH 800 MHz Filter			
	4	RFS ACU-A20-N			
	3	Ericsson 4415 Radio			
	3	Ericsson 0208 Radio			

FINAL AT&T LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
186±	3	Powerwave 7770 Antenna	(3) 13.5' T-Frames	(12) 1-5/8" Coax **(2) 1/2" Fiber** **(6) 3/4" DC Power**	AT&T
	1	KMW AM-X-CD-16-65-00T-RET Antenna			
	2	Kathrein 800 10121 Antenna			
	3	CCI HPA-65R-BUU-H6 Antenna			
	3	**KMW EPBQ-654L8H8-L2 Antenna**			
	6	CCI DTMABP7819VG12A TMA			
	6	Powerwave LGP 13519 Diplexer			
	4	Kathrein 860 10125 RET			
	3	Ericsson RRUS 11 Remote Radio			
	3	Ericsson RRUS 32 Remote Radio			
	3	**Ericsson RRUS 4478 B5 Remote Radio**			
	3	**Ericsson RRUS 4426 B66 Remote Radio**			
	3	**Ericsson RRUS 32 B66 Remote Radio**			
	1	Raycap DC6-48-60-18-8F Surge			
	1	**Raycap DC6-48-60-18-8F Surge**			

Notes:

1. ACGI should be notified of any discrepancies found in the data listed in this report.
2. Notify ACGI if any potential physical and other interference with existing antennas for a redesign.

8. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	350 - 340	Leg	2	3	-6.348	49.286	12.9	Pass
		Diagonal	L2x1 1/2x3/16	9	-2.156	10.346	20.8	Pass
							31.4 (b)	
		Top Girt	L3x3x1/4	4	-0.325	28.598	1.1	Pass
							3.2 (b)	
T2	340 - 320	Leg	2	21	-32.518	72.063	45.1	Pass
		Diagonal	L2x1 1/2x3/16	24	-3.305	11.584	28.5	Pass
							45.6 (b)	
T3	320 - 300	Leg	2 1/2	54	-51.296	112.346	45.7	Pass
		Diagonal	L2x2x3/16	75	-2.736	13.174	20.8	Pass
							36.5 (b)	
T4	300 - 280	Leg	3 1/4	81	-65.920	183.313	36.0	Pass
		Diagonal	L2-1/2x2-1/2x3/16	84	-2.299	13.474	17.1	Pass
							28.0 (b)	
T5	280 - 260	Leg	3 1/4	102	-81.260	183.313	44.3	Pass
		Diagonal	L2-1/2x2-1/2x3/16	108	-2.488	10.341	24.1	Pass
							31.3 (b)	
T6	260 - 240	Leg	3 1/2	123	-97.475	234.484	41.6	Pass
		Diagonal	L3x3x3/16	128	-2.939	13.820	21.3	Pass
							37.5 (b)	
T7	240 - 220	Leg	3 1/2	144	-113.322	306.641	37.0	Pass
		Diagonal	2L2 1/2x2 1/2x3/16x3/8	152	-3.842	25.202	15.2	Pass
							24.2 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	148	-2.155	8.246	26.1	Pass
							27.5 (b)	
		Inner Bracing	L2 1/2x2 1/2x3/16	156	-0.011	7.609	0.6	Pass
T8	220 - 200	Leg	3 3/4	183	-131.360	368.015	35.7	Pass
		Diagonal	2L2 1/2x2 1/2x3/16x3/8	191	-4.341	21.196	20.5	Pass
							23.8 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	187	-2.382	6.207	38.4	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	194	-0.012	5.772	0.7	Pass
T9	200 - 180	Leg	4	222	-151.814	434.236	35.0	Pass
		Diagonal	2L3x3x3/16x3/8	230	-6.668	30.555	21.8	Pass
							34.0 (b)	
		Horizontal	L3x3x3/16	226	-2.636	8.488	31.1	Pass
							33.7 (b)	
		Inner Bracing	L3x3x3/16	232	-0.015	7.941	0.7	Pass
T10	180 - 160	Leg	4 1/4	261	-178.441	505.220	35.3	Pass
		Diagonal	2L3x3x3/16x3/8	270	-7.596	26.278	28.9	Pass
							38.8 (b)	
		Horizontal	L3x3x3/16	265	-3.095	6.804	45.5	Pass
		Inner Bracing	L3x3x3/16	271	-0.016	6.396	0.8	Pass
T11	160 - 140	Leg	4 1/4	300	-206.384	505.220	40.9	Pass
		Diagonal	2L3x3x3/16x3/8	308	-8.456	22.339	37.9	Pass
							44.6 (b)	
		Horizontal	L3 1/2x3 1/2x1/4	304	-3.579	11.687	30.6	Pass
							34.3 (b)	
		Inner Bracing	L3 1/2x3 1/2x1/4	310	-0.019	11.050	0.7	Pass
T12	140 - 120	Leg	4 1/2	339	-228.062	580.902	39.3	Pass
		Diagonal	2L3x3x1/4x3/8	358	-12.664	31.416	40.3	Pass
							45.0 (b)	
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	347	-3.955	13.682	28.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	352	-3.956	5.620	70.4	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	375	-2.687	6.069	44.3	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	361	-0.028	9.656	0.7	Pass
T13	120 - 100	Leg	4 3/4	384	-260.060	661.231	39.3	Pass
		Diagonal	2L3x3x1/4x3/8	400	-12.490	28.916	43.2	Pass
							48.7 (b)	
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	392	-4.510	11.547	39.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Redund Horz 1 Bracing	L2x2x3/16	401	-4.511	4.748	95.0	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	420	-2.960	5.494	53.9	Pass
		Inner Bracing	L4x4x1/4	408	-0.030	12.311	0.8	Pass
T14	100 - 80	Leg	4 3/4	429	-289.717	661.231	43.8	Pass
		Diagonal	2L3x3x1/4x3/8	448	-13.761	26.593	51.7	Pass
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	437	-5.024	9.860	51.0	Pass
		Redund Horz 1 Bracing	L2x2x3/8	464	-5.025	7.521	66.8	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	465	-3.203	4.968	64.5	Pass
		Inner Bracing	L4x4x1/4	451	-0.031	10.555	0.8	Pass
T15	80 - 60	Leg	5	474	-321.487	746.168	43.1	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	493	-13.718	38.008	36.1 44.8 (b)	Pass
		Horizontal	2L3x3x3/16x3/8	482	-5.575	15.048	37.1	Pass
		Redund Horz 1 Bracing	L2-1/2x2-1/2x3/16	487	-5.577	6.992	79.8	Pass
		Redund Diag 1 Bracing	L3x3x3/16	513	-3.467	7.925	43.8	Pass
		Inner Bracing	2L3x3x3/16x3/8	496	-0.037	14.343	0.8	Pass
T16	60 - 40	Leg	5 1/4	519	-351.893	835.679	42.1	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	538	-15.101	35.047	43.1 45.9 (b)	Pass
		Horizontal	2L3x3x3/16x3/8	527	-6.103	13.146	46.4	Pass
		Redund Horz 1 Bracing	L2-1/2x2-1/2x3/16	554	-6.104	6.113	99.9	Pass
		Redund Diag 1 Bracing	L3x3x3/16	558	-3.715	7.227	51.4	Pass
		Inner Bracing	2L3x3x3/16x3/8	542	-0.038	12.552	0.9	Pass
T17	40 - 20	Leg	5 1/4	562	-384.529	835.679	46.0	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	583	-14.997	32.326	46.4 48.2 (b)	Pass
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	565	-6.669	24.167	27.6	Pass
		Redund Horz 1 Bracing	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower	584	-6.670	14.963	44.6	Pass
		Redund Diag 1 Bracing	L3x3x3/16	591	-3.987	6.591	60.5	Pass
		Inner Bracing	2L3 1/2x3 1/2x1/4x3/8	586	-0.043	23.141	0.7	Pass
T18	20 - 0	Leg	5 1/2	607	-416.844	929.740	44.8	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	628	-15.968	29.896	53.4	Pass
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	610	-7.229	21.456	33.7	Pass
		Redund Horz 1 Bracing	L3x3x3/16	612	-7.229	8.374	86.3	Pass
		Redund Diag 1 Bracing	L3x3x3/16	651	-4.254	6.043	70.4	Pass
		Inner Bracing	2L3 1/2x3 1/2x1/4x3/8	633	-0.042	20.572	0.7	Pass
						Summary		
						Leg (T17)	46.0	Pass
						Diagonal (T18)	53.4	Pass
						Horizontal (T14)	51.0	Pass
						Top Girt (T1)	3.2	Pass
						Redund Horz 1 Bracing (T16)	99.9	Pass
						Redund Diag 1 Bracing (T18)	70.4	Pass
						Inner Bracing (T16)	0.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
						Bolt Checks	49.5	Pass
						RATING =	**99.9**	**Pass**

APPENDIX

TOWER DATA

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

Hazards by Location

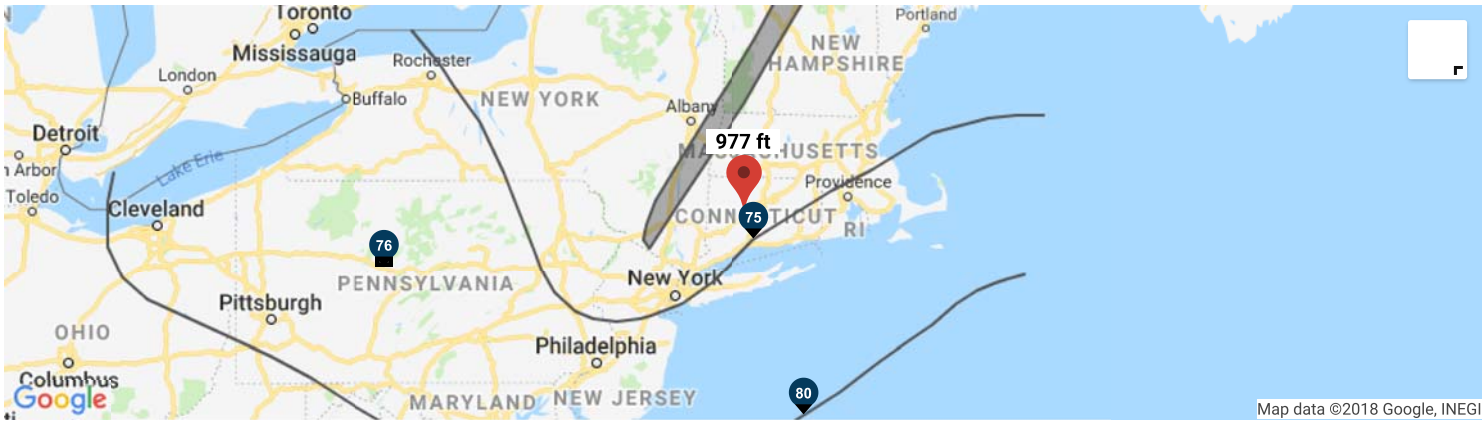
Search Information

Coordinates: 41.621581, -72.973633

Timestamp: 2018-10-31T22:13:22.101Z

Hazard Type: Wind

Map Results



Text Results

ASCE 7-16

MRI 10-Year	75 mph
MRI 25-Year	83 mph
MRI 50-Year	90 mph
MRI 100-Year	97 mph
Risk Category I	107 mph
Risk Category II	117 mph
Risk Category III	126 mph
Risk Category IV	⚠ 131 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	76 mph
MRI 25-Year	86 mph
MRI 50-Year	92 mph
MRI 100-Year	99 mph
Risk Category I	110 mph
Risk Category II	121 mph
Risk Category III-IV	⚠ 130 mph

If the structure under consideration is a healthcare facility, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed ..... 100 mph

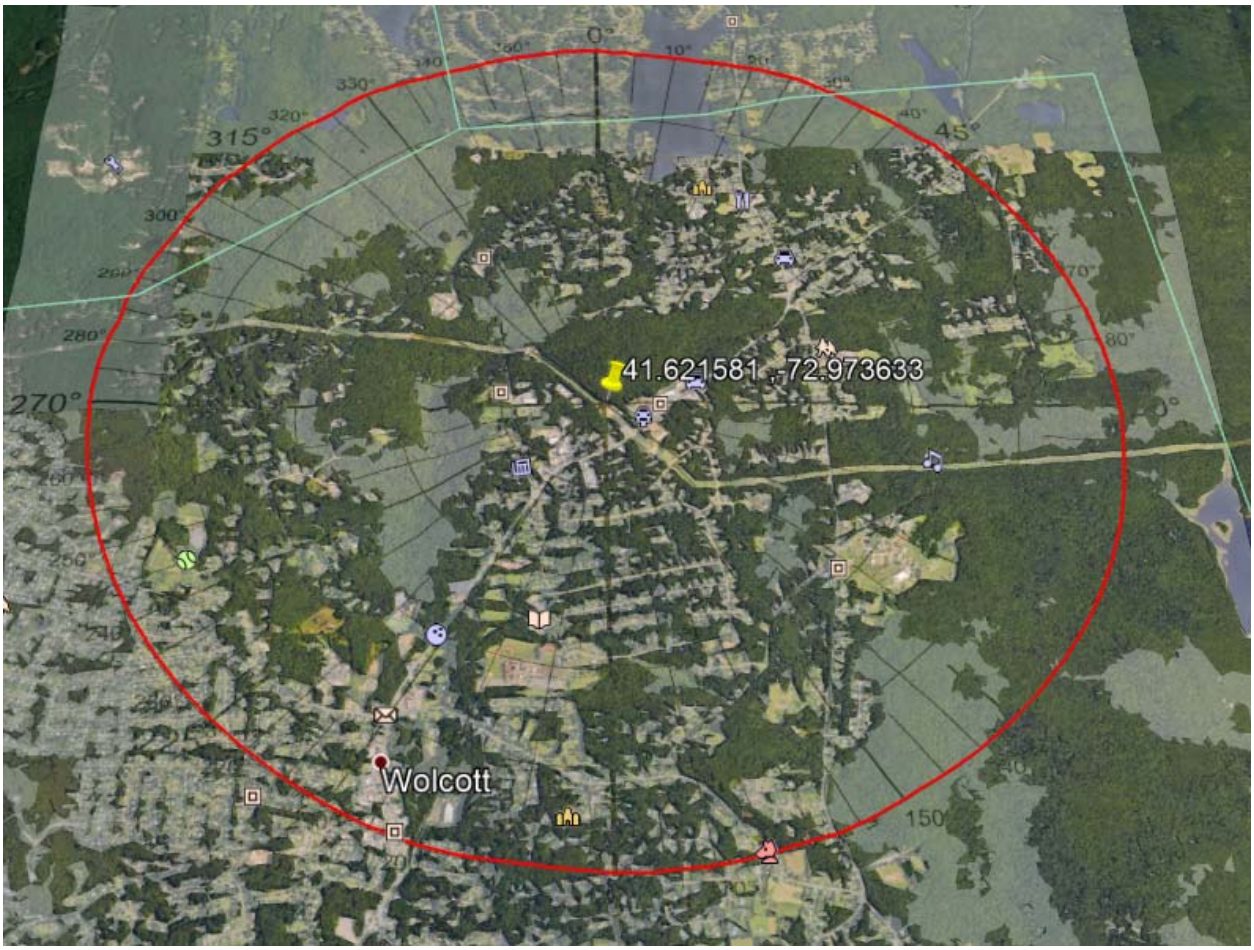
The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

CT20021-A-08 Cleary Tower (Edward)

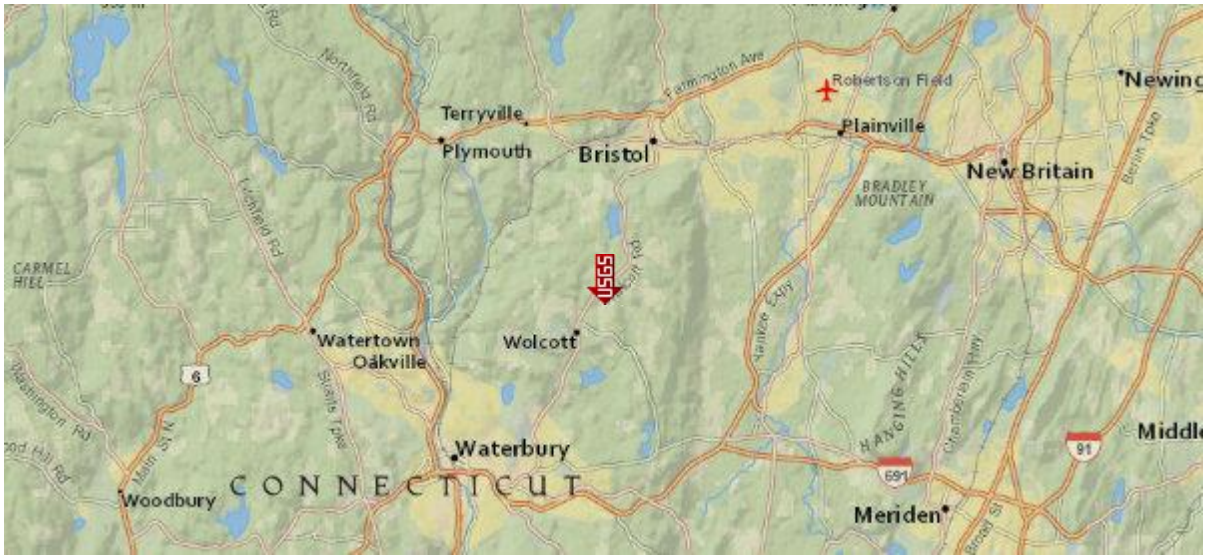


Structure Class II*.
Exposure Category B.
Topographic Category 1.

USGS Design Maps Summary Report

User–Specified Input

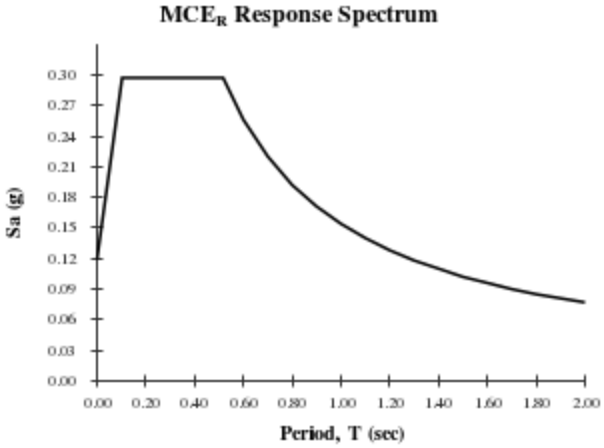
Report Title	CT20021-A-08 Cleary Tower (Edward) Tue October 30, 2018 17:03:46 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.62158°N, 72.97363°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

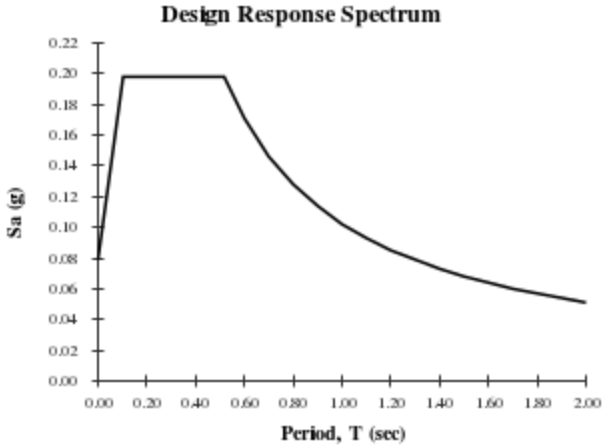


USGS–Provided Output

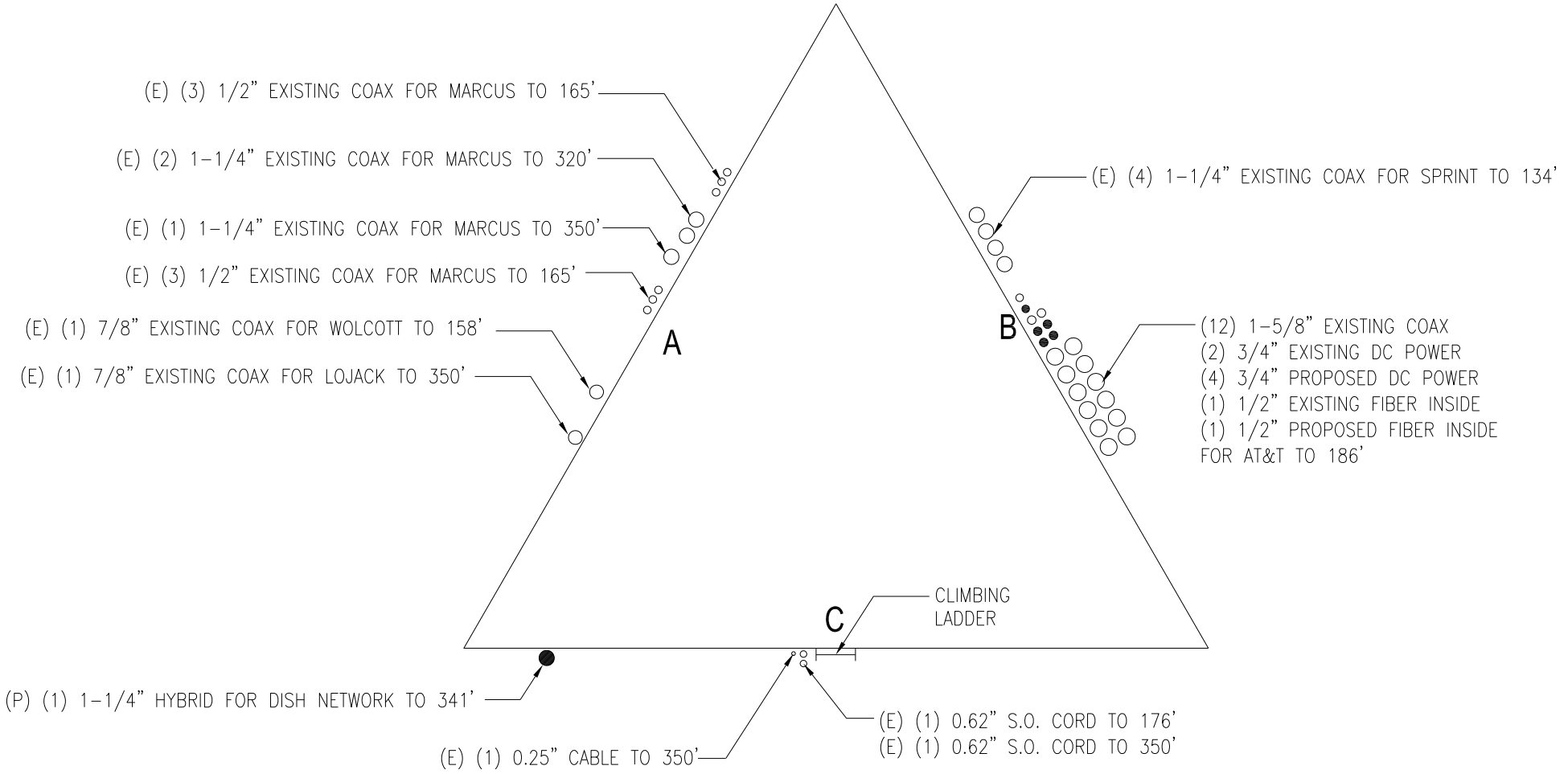
S_S =	0.186 g	S_{MS} =	0.297 g	S_{DS} =	0.198 g
S_1 =	0.064 g	S_{M1} =	0.154 g	S_{D1} =	0.102 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





COAX LAYOUT

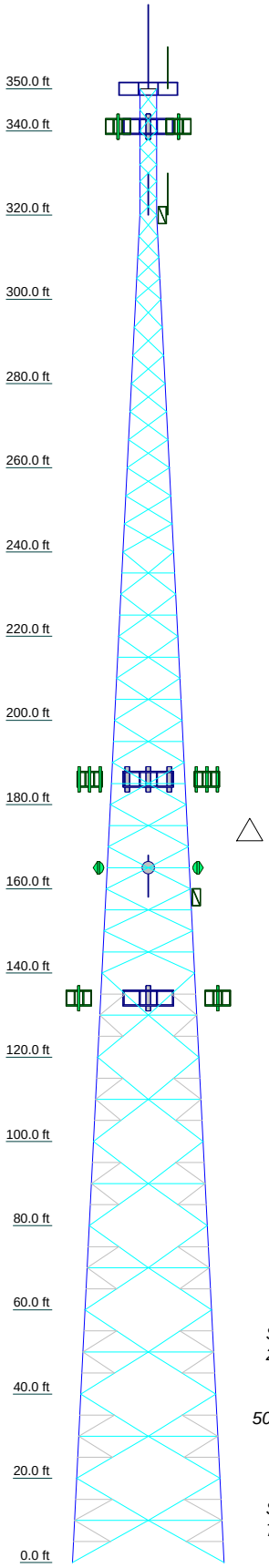


COAX LAYOUT

N.T.S

TOWER ELEVATION DRAWING

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18
Legs		SR 2	SR 2	SR 2 1/2	SR 3 1/4	SR 3 1/2	SR 3 3/4	SR 4	SR 4 1/4	SR 4 1/2	SR 4 3/4	SR 5	SR 5 1/4	SR 5 1/2					
Leg Grade		A572-50																	
Diagonals		2L3 1/2x3 1/2x1/4x3/8		2L3x3x1/4x3/8		2L3x3x3/16x3/8		2L2 1/2x2 1/2x3/16x3/8				B			2L2 1/2x2 1/2x3/16x3/8		2L3x3x3/16x3/8		
Diagonal Grade		A36																	
Top Girts		N.A.																	
Horizontals		2L3 1/2x3 1/2x1/4x3/8		2L3x3x3/16x3/8		2L2 1/2x2 1/2x3/16x3/8			L2 1/2x2 1/2x3/16		L3x3x3/16								
Red. Horizontals		C		L2-1/2x2-1/2x3/16		L2x2x3/8		N.A.						L2x2x3/16					
Red. Diagonals		L3x3x3/16		L3x3x3/16		L4x4x1/4		N.A.			L3x3x3/16		L3 1/2x3 1/2x1/4		L2-1/2x2-1/2x3/16				
Inner Bracing		2L3 1/2x3 1/2x1/4x3/8		2L3x3x3/16x3/8		L2 1/2x2 1/2x3/16			L2 1/2x2 1/2x3/16										
Face Width (ft)	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4		
# Panels @ (ft)		14 @ 10						9 @ 6.66667		20 @ 5								4 @ 5	5 @ 4	2 @ 5
Weight (K)	95.3	10.8	10.1	9.1	8.5	7.4	7.0	6.4	5.7	5.1	4.2	3.7	3.0	2.4	2.3	1.5	1.1	0.6	



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3x3x1/4	C	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower
B	L3 1/2x3 1/2x1/4		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 99.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 432 K
SHEAR: 49 K

UPLIFT: -316 K
SHEAR: 37 K

AXIAL 294 K
SHEAR 24 K
MOMENT 4000 kip-ft
TORQUE 9 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 136 K
SHEAR 77 K
MOMENT 12049 kip-ft
TORQUE 37 kip-ft
REACTIONS - 97 mph WIND

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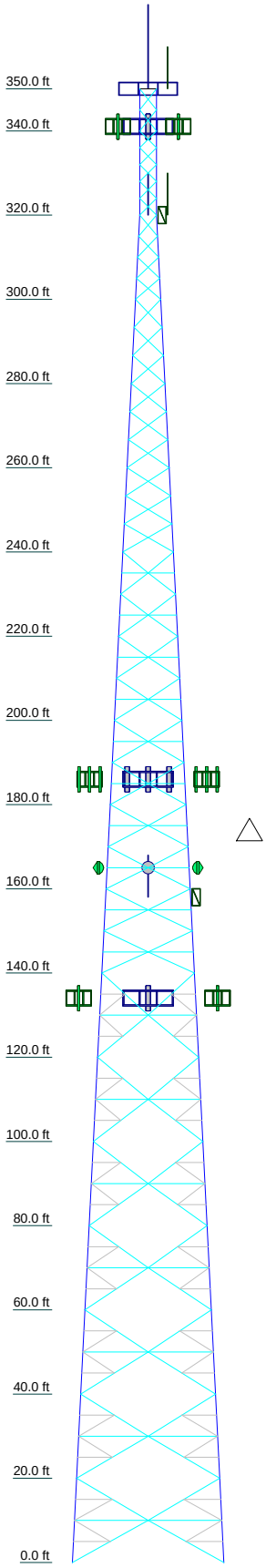
Job: **18-7241**			
Project: ***CT20021-A-08 Cleary Tower (Edward)***			
Client: AT&T SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 11/01/18	Scale: NTS	
Path:		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18
Legs	SR 2	SR 2	SR 2 1/2	SR 3 1/4	SR 3 1/2	SR 3 3/4	SR 4	SR 4 1/4	SR 4 1/2	SR 4 3/4	SR 5	SR 5 1/4	SR 5 1/2					
Leg Grade	A572-50																	
Diagonals	2L3 1/2x3 1/2x1/4x3/8	L2x1 1/2x3/16	L2x2x3/16	L2-1/2x2-1/2x3/16	L3x3x3/16	2L2 1/2x2 1/2x3/16x3/8		2L3x3x1/4x3/8										
Diagonal Grade	A36																	
Top Girts	A			N.A.														
Horizontals	2L3 1/2x3 1/2x1/4x3/8			N.A.		L2 1/2x2 1/2x3/16		B	L3x3x3/16					2L2 1/2x2 1/2x3/16x3/8		2L3x3x3/16x3/8		
Red. Horizontals	C				N.A.									L2x2x3/8	L2-1/2x2-1/2x3/16			L3x3x3/16
Red. Diagonals	L3x3x3/16				N.A.									L2-1/2x2-1/2x3/16				
Inner Bracing	2L3 1/2x3 1/2x1/4x3/8				L2 1/2x2 1/2x3/16					L3x3x3/16	L3 1/2x3 1/2x1/4			L4x4x1/4	2L3x3x3/16x3/8			
Face Width (ft)	36	34		32	10	12	14	16	18	20	22		24	26	28	30	32	
# Panels @ (ft)			4 @ 5	6	9 @ 6.66667			20 @ 5							14 @ 10			
Weight (K)	95.3	10.8	10.1	9.1	8.5	7.4	7.0	6.4	5.7	5.1	4.2	3.7	3.0	2.4	2.3	1.5	1.1	0.6
			5 @ 4															2 @ 5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Celwave PD200 Omni (LoJack)	350	860 10125 RET (ATI)	186
101 Omni (Marcus)	350	RRUS 11 (ATI)	186
Star Mount w/ (9) Standoffs (Marcus/LoJack)	350	AM-X-CD-16-65-00T-RET (ATI)	186
800 10622 (Dish Network)	341	800-10121 (ATI)	186
800 10622 (Dish Network)	341	800-10121 (ATI)	186
800 10622 (Dish Network)	341	HPA-65R-BUU-H6 (ATI)	186
4415 (Dish Network)	341	HPA-65R-BUU-H6 (ATI)	186
4415 (Dish Network)	341	HPA-65R-BUU-H6 (ATI)	186
4415 (Dish Network)	341	EPBQ-654L8-H8-L2 (ATI)	186
0208 (Dish Network)	341	EPBQ-654L8-H8-L2 (ATI)	186
0208 (Dish Network)	341	EPBQ-654L8-H8-L2 (ATI)	186
0208 (Dish Network)	341	(2) CCI DTMA-BP7819VG12A (ATI)	186
Commscope SF-SU7-2-96 Sector Frame (Dish Network)	341	(2) CCI DTMA-BP7819VG12A (ATI)	186
Commscope SF-SU7-2-96 Sector Frame (Dish Network)	341	(2) CCI DTMA-BP7819VG12A (ATI)	186
Commscope SF-SU7-2-96 Sector Frame (Dish Network)	341	(2) Pipe Mounts (5.25' x 4.5") (Marcus)	165
101 Omni (Marcus)	320	(2) Pipe Mounts (5.25' x 4.5") (Marcus)	165
101 Omni (Marcus)	320	(2) Pipe Mounts (5.25' x 4.5") (Marcus)	165
6' Standoff (Marcus)	320	Radiowaves SPD3-2.4 Dish (Marcus)	165
6' Standoff (Marcus)	320	Radiowaves SPD3-2.4 Dish (Marcus)	165
RRUS 11 (ATI)	186	Radiowaves SPD3-2.4 Dish (Marcus)	165
RRUS 11 (ATI)	186	Radiowaves SPD2-5.8 Dish (Marcus)	165
RRUS 32 (ATI)	186	Radiowaves SPD2-5.8 Dish (Marcus)	165
RRUS 32 (ATI)	186	Radiowaves SPD2-5.8 Dish (Marcus)	165
RRUS 32 (ATI)	186	Decibel DB408 Omni (Wolcott Ambulance)	158
RRUS 4478 B5 (ATI)	186	17" Standoff Mount (Wolcott)	158
RRUS 4478 B5 (ATI)	186	15' T-Frames (Sprint)	134
RRUS 4478 B5 (ATI)	186	15' T-Frames (Sprint)	134
RRUS 4426 (ATI)	186	15' T-Frames (Sprint)	134
RRUS 4426 (ATI)	186	RRH 800 MHz (Sprint)	134
RRUS 4426 (ATI)	186	RRH 800 MHz (Sprint)	134
RRUS 32 B66 (ATI)	186	TD-RRH8x20-25 (Sprint)	134
RRUS 32 B66 (ATI)	186	ACU-A20-N (Sprint)	134
RRUS 32 B66 (ATI)	186	ACU-A20-N (Sprint)	134
(2) LGP13519 Diplexer (ATI)	186	APXVTM14-C-I20 (Sprint)	134
(2) LGP13519 Diplexer (ATI)	186	APXVTM14-C-I20 (Sprint)	134
(2) LGP13519 Diplexer (ATI)	186	APXVTM14-C-I20 (Sprint)	134
DC6-48-60-18-8F (ATI)	186	RFS APXVSPP18 (Sprint)	134
DC6-48-60-18-8F (ATI)	186	RFS APXVSPP18 (Sprint)	134
13.5' T-Frames (ATI)	186	RFS APXVSPP18 (Sprint)	134
13.5' T-Frames (ATI)	186	RRH 1900 MHz (Sprint)	134
13.5' T-Frames (ATI)	186	RRH 1900 MHz (Sprint)	134
7770 (ATI)	186	RRH 1900 MHz (Sprint)	134
7770 (ATI)	186	RRH 800 MHz (Sprint)	134
7770 (ATI)	186	TD-RRH8x20-25 (Sprint)	134
860 10125 RET (ATI)	186	TD-RRH8x20-25 (Sprint)	134
(2) 860 10125 RET (ATI)	186	RRH 800 MHz Filter (Sprint)	134
		RRH 800 MHz Filter (Sprint)	134
		RRH 800 MHz Filter (Sprint)	134
		(2) ACU-A20-N (Sprint)	134

SYMBOL LIST

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MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
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TOWER DESIGN NOTES

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

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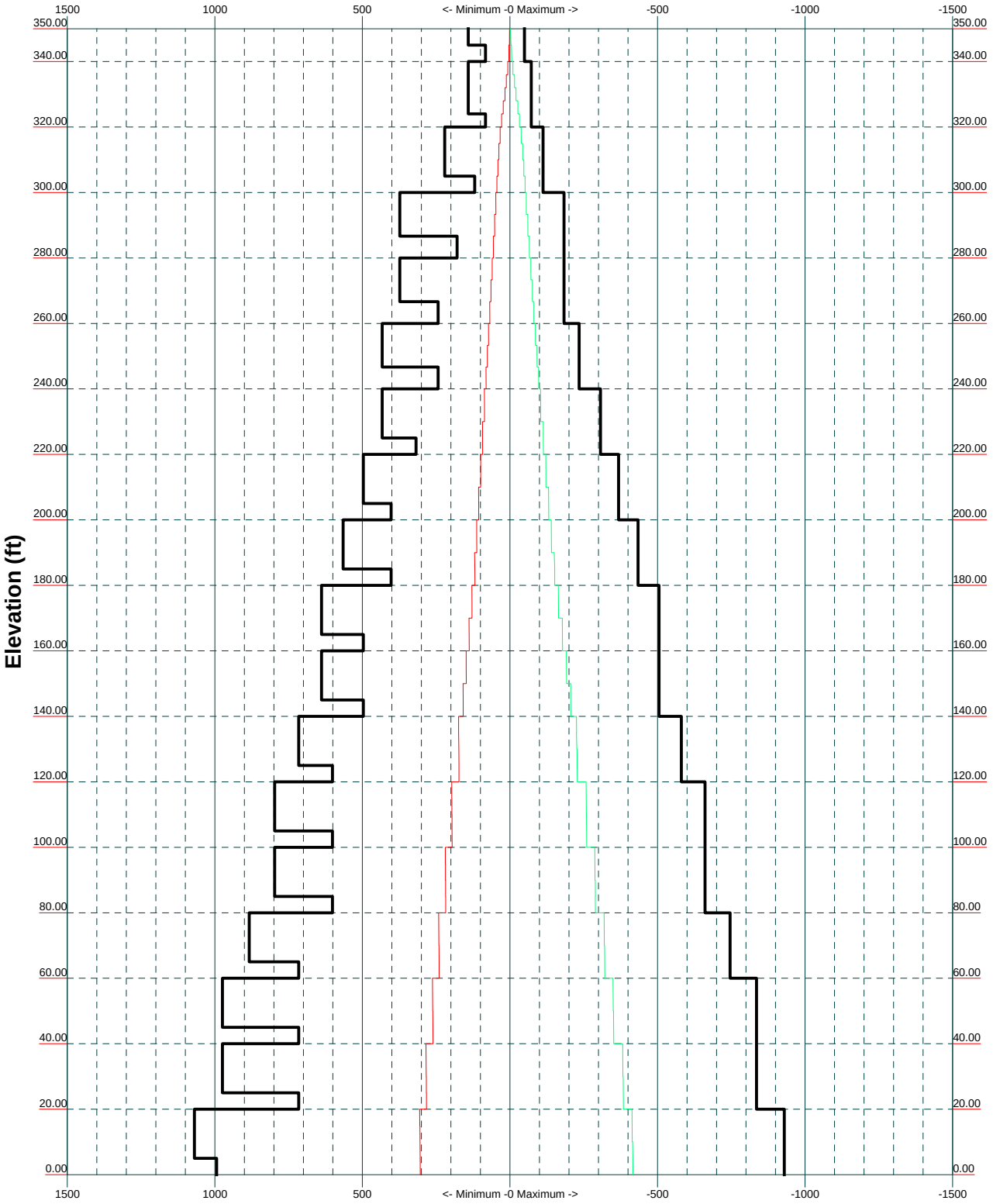
Client: AT&T SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 11/01/18	Scale: NTS	
Path:		Dwg No. E-1	

MISCELLANEOUS PLOTS

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

Leg Capacity ——— Leg Compression (K)



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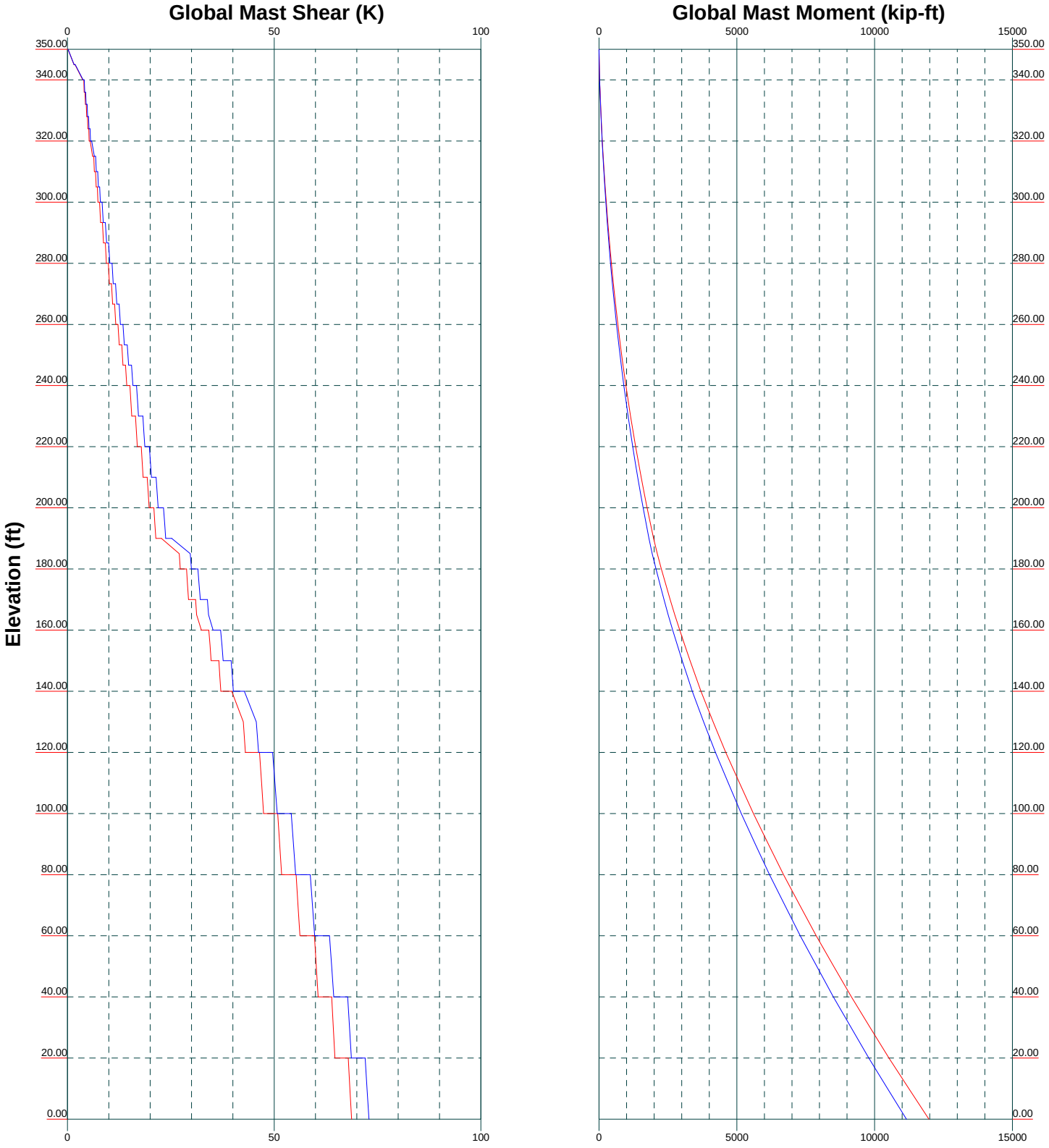
Client: AT&T SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 11/01/18	Scale: NTS
Path:		Dwg No. E-3

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

Maximum Values

Vx Vz Mx Mz



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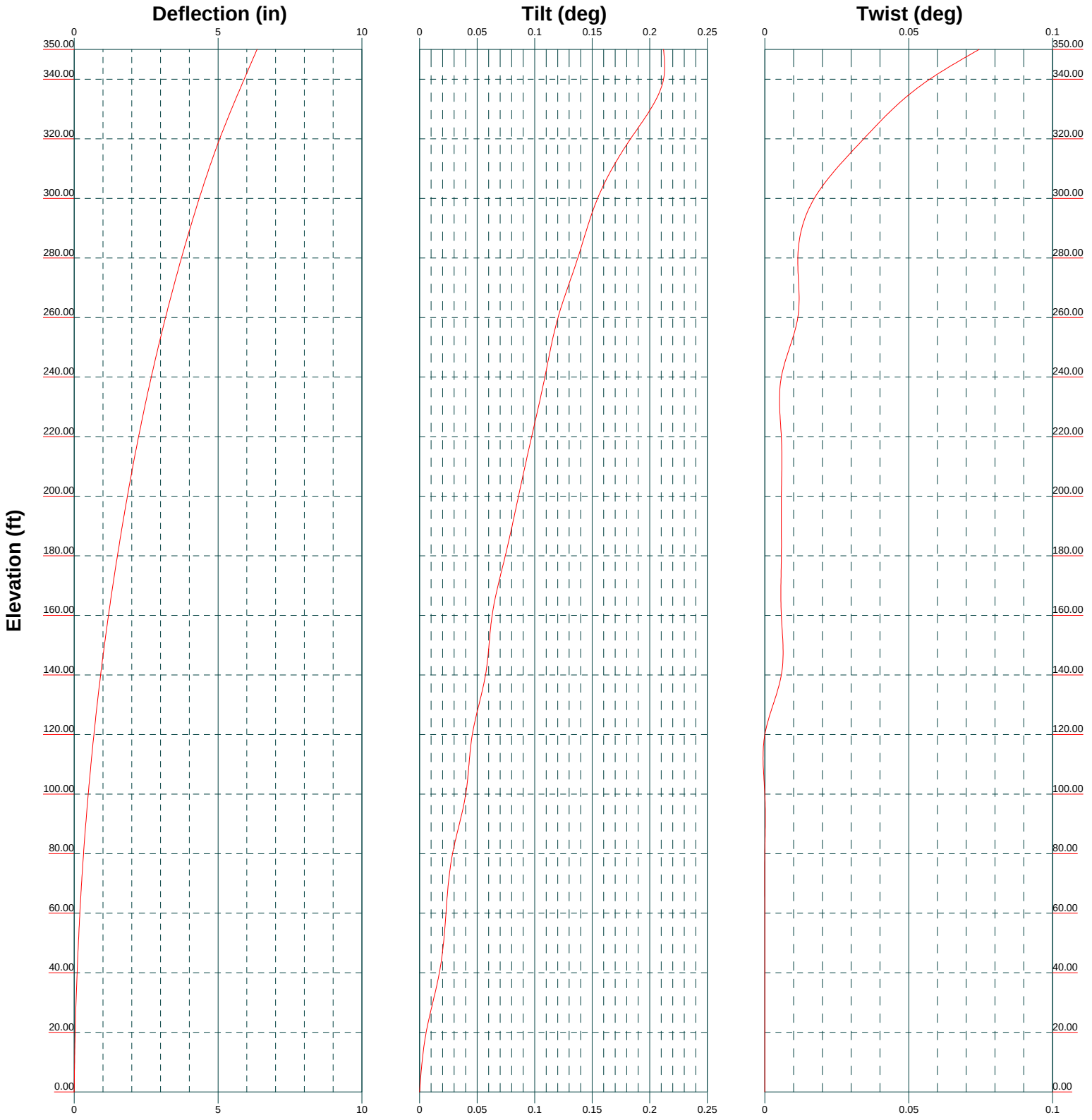
Job: ***18-7241***		
Project: ***CT20021-A-08 Cleary Tower (Edward)***		
Client: AT&T SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 11/01/18	Scale: NTS
Path:		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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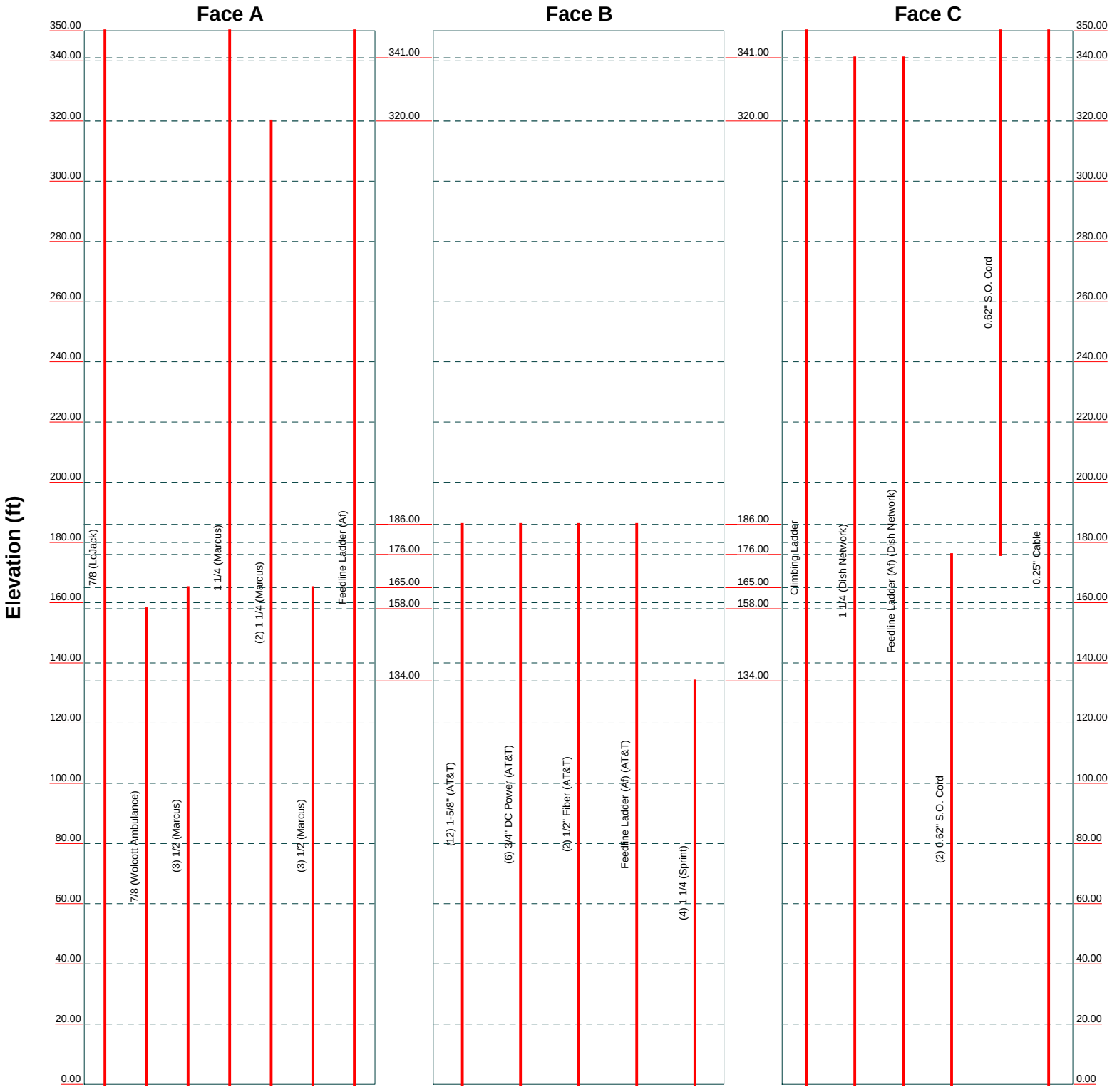
Client: AT&T SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 11/01/18	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 350'

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



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Job: ***18-7241***		
Project: ***CT20021-A-08 Cleary Tower (Edward)***		
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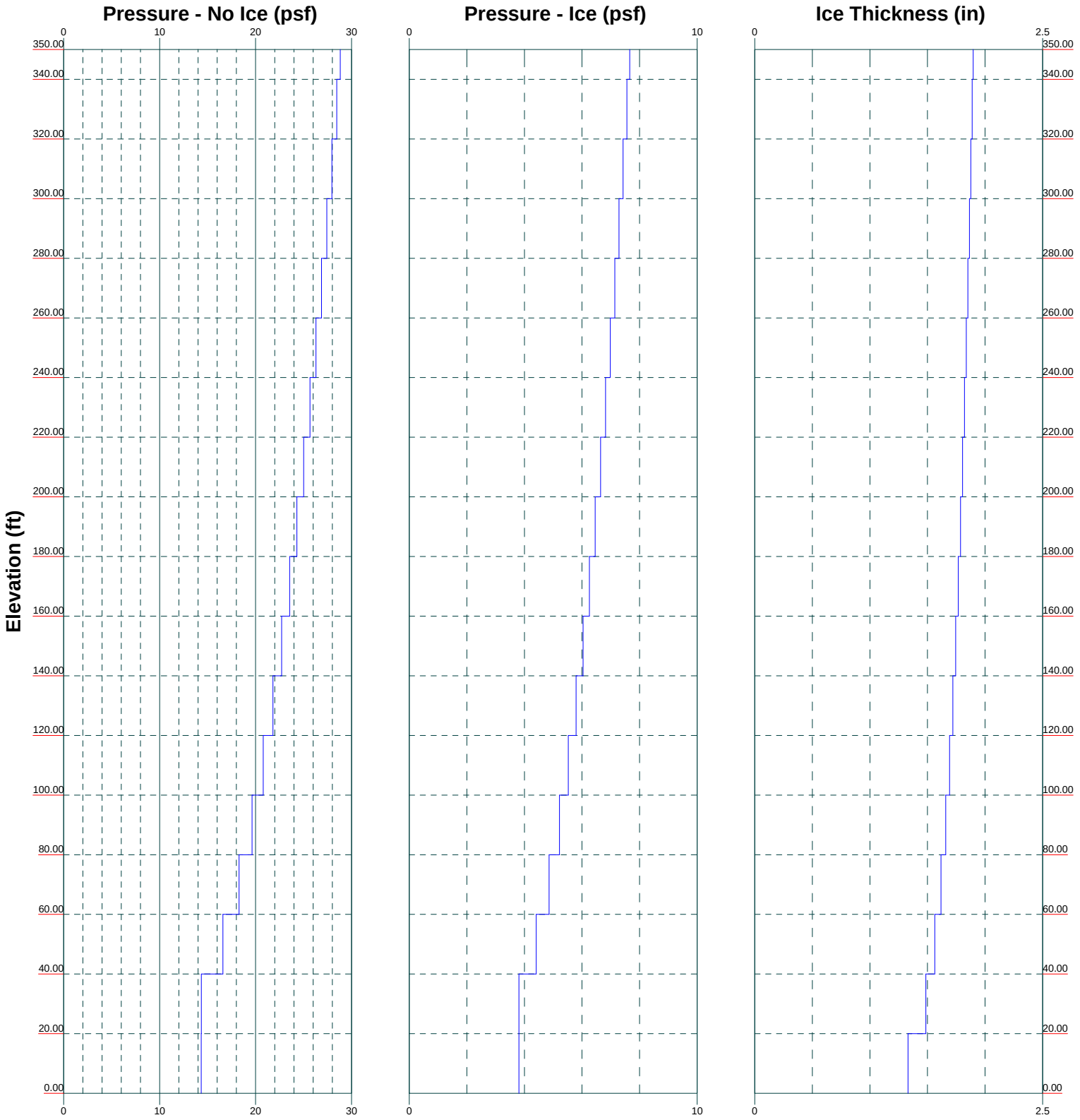
Code: TIA-222-G	Date: 11/01/18	Scale: NTS
Path:		Dwg No. E-7

Wind Pressures and Ice Thickness

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



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Job: ***18-7241***		
Project: ***CT20021-A-08 Cleary Tower (Edward)***		
Client: AT&T SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 11/01/18	Scale: NTS
Path:		Dwg No. E-9

CALCULATION PRINTOUT

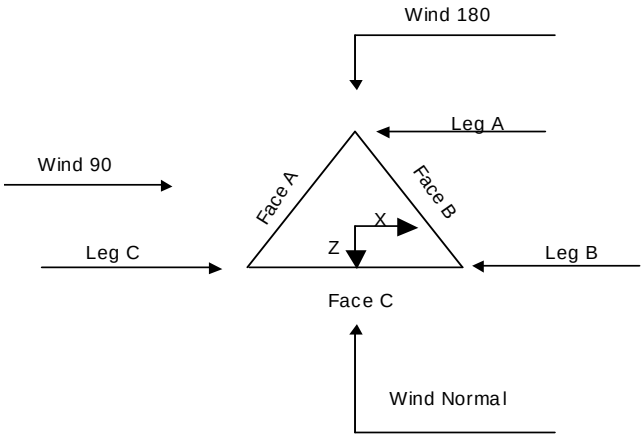
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 350.00 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 4.00 ft at the top and 36.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

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

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)	√	Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	350.00-340.00			4.00	1	10.00
T2	340.00-320.00			4.00	1	20.00
T3	320.00-300.00			4.00	1	20.00
T4	300.00-280.00			6.00	1	20.00
T5	280.00-260.00			8.00	1	20.00
T6	260.00-240.00			10.00	1	20.00
T7	240.00-220.00			12.00	1	20.00
T8	220.00-200.00			14.00	1	20.00
T9	200.00-180.00			16.00	1	20.00
T10	180.00-160.00			18.00	1	20.00
T11	160.00-140.00			20.00	1	20.00
T12	140.00-120.00			22.00	1	20.00
T13	120.00-100.00			24.00	1	20.00
T14	100.00-80.00			26.00	1	20.00
T15	80.00-60.00			28.00	1	20.00
T16	60.00-40.00			30.00	1	20.00
T17	40.00-20.00			32.00	1	20.00
T18	20.00-0.00			34.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	350.00-340.00	5.00	X Brace	No	No	0.0000	0.0000
T2	340.00-320.00	4.00	X Brace	No	No	0.0000	0.0000
T3	320.00-300.00	5.00	X Brace	No	No	0.0000	0.0000
T4	300.00-280.00	6.67	X Brace	No	No	0.0000	0.0000
T5	280.00-260.00	6.67	X Brace	No	No	0.0000	0.0000
T6	260.00-240.00	6.67	X Brace	No	No	0.0000	0.0000
T7	240.00-220.00	5.00	Double K	No	Yes	0.0000	0.0000
T8	220.00-200.00	5.00	Double K	No	Yes	0.0000	0.0000
T9	200.00-180.00	5.00	Double K	No	Yes	0.0000	0.0000
T10	180.00-160.00	5.00	Double K	No	Yes	0.0000	0.0000
T11	160.00-140.00	5.00	Double K	No	Yes	0.0000	0.0000
T12	140.00-120.00	10.00	Double K1	No	Yes	0.0000	0.0000
T13	120.00-100.00	10.00	Double K1	No	Yes	0.0000	0.0000
T14	100.00-80.00	10.00	Double K1	No	Yes	0.0000	0.0000
T15	80.00-60.00	10.00	Double K1	No	Yes	0.0000	0.0000
T16	60.00-40.00	10.00	Double K1	No	Yes	0.0000	0.0000
T17	40.00-20.00	10.00	Double K1	No	Yes	0.0000	0.0000
T18	20.00-0.00	10.00	Double K1	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 350.00-340.00	Solid Round	2	A572-50 (50 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T2 340.00-320.00	Solid Round	2	A572-50 (50 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T3 320.00-300.00	Solid Round	2 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 300.00-280.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2-1/2x2-1/2x3/16	A36 (36 ksi)
T5 280.00-260.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2-1/2x2-1/2x3/16	A36 (36 ksi)
T6 260.00-240.00	Solid Round	3 1/2	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 240.00-220.00	Solid Round	3 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T8 220.00-200.00	Solid Round	3 3/4	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T9 200.00-180.00	Solid Round	4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T10 180.00-160.00	Solid Round	4 1/4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T11 160.00-140.00	Solid Round	4 1/4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T12 140.00-120.00	Solid Round	4 1/2	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T13 120.00-100.00	Solid Round	4 3/4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T14 100.00-80.00	Solid Round	4 3/4	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T15 80.00-60.00	Solid Round	5	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T16 60.00-40.00	Solid Round	5 1/4	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T17 40.00-20.00	Solid Round	5 1/4	A572-50	Double Equal	2L3 1/2x3 1/2x1/4x3/8	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T18 20.00-0.00	Solid Round	5 1/2	(50 ksi) A572-50 (50 ksi)	Angle Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T7 240.00-220.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 220.00-200.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 200.00-180.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T12 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T13 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T14 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T15 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T16 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T17 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T18 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T7 240.00-220.00	Equal Angle		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 220.00-200.00	Equal Angle		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 200.00-180.00	Equal Angle		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 180.00-160.00	Equal Angle		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T11 160.00-140.00	Equal Angle		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T12 140.00-120.00	Equal Angle		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 120.00-100.00	Equal Angle		A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T14 100.00-80.00	Equal Angle		A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T15 80.00-60.00	Equal Angle		A36 (36 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T16 60.00-40.00	Equal Angle		A36 (36 ksi)	Double Equal Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T17 40.00-20.00	Equal Angle		A36 (36 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T18 20.00-0.00	Equal Angle		A36 (36 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T12 140.00-120.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2x2x3/16 L2-1/2x2-1/2x3/16	1 1
T13 120.00-100.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2x2x3/16 L2-1/2x2-1/2x3/16	1 1
T14 100.00-80.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2x2x3/8 L2-1/2x2-1/2x3/16	1 1
T15 80.00-60.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2-1/2x2-1/2x3/16 L3x3x3/16	1 1
T16 60.00-40.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L2-1/2x2-1/2x3/16 L3x3x3/16	1 1
T17 40.00-20.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Arbitrary Shape Equal Angle	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower L3x3x3/16	1 1
T18 20.00-0.00	A36 (36 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	L3x3x3/16 L3x3x3/16	1 1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 350.00-340.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 340.00-320.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 320.00-300.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
300.00-280.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
280.00-260.00			(36 ksi)						
T6	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
260.00-240.00			(36 ksi)						
T7	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
240.00-220.00			(36 ksi)						
T8	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
220.00-200.00			(36 ksi)						
T9	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
200.00-180.00			(36 ksi)						
T10	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
180.00-160.00			(36 ksi)						
T11	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
160.00-140.00			(36 ksi)						
T12	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
140.00-120.00			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
100.00-80.00			(36 ksi)						
T15	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
80.00-60.00			(36 ksi)						
T16	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
60.00-40.00			(36 ksi)						
T17	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
40.00-20.00			(36 ksi)						
T18 20.00-0.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1]: Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
350.00-340.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
340.00-320.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
320.00-300.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
300.00-280.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
280.00-260.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
260.00-240.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
240.00-220.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
220.00-200.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
200.00-180.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T16	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T17	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T18	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
350.00-340.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
340.00-320.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
320.00-300.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
300.00-280.00														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
280.00-260.00														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
260.00-240.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
240.00-220.00														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
220.00-200.00														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
200.00-180.00														
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.00-160.00														
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-140.00														

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
T12 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 350.00-340.00	Flange	0.6250 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 340.00-320.00	Flange	0.6250 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 320.00-300.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 300.00-280.00	Flange	0.7500 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 280.00-260.00	Flange	0.8750 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 260.00-240.00	Flange	0.8750 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 240.00-220.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T8 220.00-200.00	Flange	1.1250 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	1
T9 200.00-180.00	Flange	1.1250 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	1
T10 180.00-160.00	Flange	1.2500 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	1
T11 160.00-140.00	Flange	1.2500 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	1
T12 140.00-120.00	Flange	1.3750 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1
T13 120.00-100.00	Flange	1.3750 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1
T14 100.00-80.00	Flange	1.3750 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1
T15 80.00-60.00	Flange	1.5000 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1

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.
T16 60.00-40.00	Flange	1.5000 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1
T17 40.00-20.00	Flange	1.5000 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1
T18 20.00-0.00	Flange	2.5000 A307	6	0.8750 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8 (LoJack)	A	No	Ar (CaAa)	350.00 - 0.00	0.0000	-0.15	1	1	0.5000	1.1100		0.54
7/8 (Wolcott Ambulance)	A	No	Ar (CaAa)	158.00 - 0.00	0.0000	-0.1	1	1	0.5000	1.1100		0.54
1/2 (Marcus)	A	No	Ar (CaAa)	165.00 - 0.00	0.0000	0.05	3	3	0.5000	0.5800		0.25
1 1/4 (Marcus)	A	No	Ar (CaAa)	350.00 - 0.00	0.0000	0.1	1	1	0.5000	1.5500		0.66
1 1/4 (Marcus)	A	No	Ar (CaAa)	320.00 - 0.00	0.0000	0.12	2	2	0.5000	1.5500		0.66
1/2 (Marcus)	A	No	Ar (CaAa)	165.00 - 0.00	0.0000	0.15	3	3	0.5000	0.5800		0.25
Feedline Ladder (Af) ****	A	No	Af (CaAa)	350.00 - 0.00	0.0000	0	1	1	1.5000	1.5000		4.20
1-5/8" (AT&T)	B	No	Ar (CaAa)	186.00 - 0.00	0.0000	0.15	12	6	0.5000	1.9800		0.82
3/4" DC Power (AT&T)	B	No	Ar (CaAa)	186.00 - 0.00	0.0000	0.05	6	3	0.5000	0.8650		0.15
1/2" Fiber (AT&T)	B	No	Ar (CaAa)	186.00 - 0.00	0.0000	0.05	2	2	0.5000	0.6400		0.11
Feedline Ladder (Af) (AT&T) ****	B	No	Af (CaAa)	186.00 - 0.00	0.0000	0	1	1	1.5000	1.5000		4.20
1 1/4 (Sprint) ****	B	No	Ar (CaAa)	134.00 - 0.00	0.0000	-0.15	4	4	0.5000	1.5500		0.66
Climbing Ladder ****	C	No	Af (CaAa)	350.00 - 0.00	0.0000	0	1	1	0.5000	1.5000		7.90
1 1/4 (Dish Network)	C	No	Ar (CaAa)	341.00 - 0.00	0.0000	0.4	1	1	0.5000	1.5500		0.66
Feedline Ladder (Af) (Dish Network) ****	C	No	Af (CaAa)	341.00 - 0.00	0.0000	0.4	1	1	1.5000	1.5000		4.20
0.62" S.O.	C	No	Ar (CaAa)	176.00 - 0.00	0.0000	0	2	2	0.0000	0.6200		0.31

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
Cord 0.62" S.O.	C	No	Ar (CaAa)	350.00 - 176.00	0.0000	0	1	1	0.0000	0.6200		0.31
Cord 0.25" Cable	C	No	Ar (CaAa)	350.00 - 0.00	0.0000	0	1	1	0.5000	0.2500		0.13

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	350.00-340.00	A	0.000	0.000	5.160	0.000	0.054
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.775	0.000	0.088
T2	340.00-320.00	A	0.000	0.000	10.320	0.000	0.108
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T3	320.00-300.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T4	300.00-280.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T5	280.00-260.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T6	260.00-240.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T7	240.00-220.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T8	220.00-200.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	14.840	0.000	0.264
T9	200.00-180.00	A	0.000	0.000	16.520	0.000	0.134
		B	0.000	0.000	19.638	0.000	0.091
		C	0.000	0.000	14.840	0.000	0.264
T10	180.00-160.00	A	0.000	0.000	18.260	0.000	0.142
		B	0.000	0.000	65.460	0.000	0.303
		C	0.000	0.000	15.832	0.000	0.269
T11	160.00-140.00	A	0.000	0.000	25.478	0.000	0.174
		B	0.000	0.000	65.460	0.000	0.303
		C	0.000	0.000	16.080	0.000	0.270
T12	140.00-120.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	74.140	0.000	0.340
		C	0.000	0.000	16.080	0.000	0.270
T13	120.00-100.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356
		C	0.000	0.000	16.080	0.000	0.270
T14	100.00-80.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356
		C	0.000	0.000	16.080	0.000	0.270
T15	80.00-60.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356
		C	0.000	0.000	16.080	0.000	0.270
T16	60.00-40.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	16.080	0.000	0.270
T17	40.00-20.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356
		C	0.000	0.000	16.080	0.000	0.270
T18	20.00-0.00	A	0.000	0.000	25.700	0.000	0.175
		B	0.000	0.000	77.860	0.000	0.356
		C	0.000	0.000	16.080	0.000	0.270

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	350.00-340.00	A	1.897	0.000	0.000	16.541	0.000	0.282
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	15.915	0.000	0.291
T2	340.00-320.00	A	1.888	0.000	0.000	32.981	0.000	0.561
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	52.608	0.000	0.950
T3	320.00-300.00	A	1.877	0.000	0.000	55.505	0.000	0.810
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	52.372	0.000	0.943
T4	300.00-280.00	A	1.864	0.000	0.000	55.268	0.000	0.803
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	52.123	0.000	0.935
T5	280.00-260.00	A	1.851	0.000	0.000	55.016	0.000	0.796
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	51.857	0.000	0.927
T6	260.00-240.00	A	1.837	0.000	0.000	54.747	0.000	0.789
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	51.574	0.000	0.919
T7	240.00-220.00	A	1.821	0.000	0.000	54.457	0.000	0.780
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	51.269	0.000	0.909
T8	220.00-200.00	A	1.805	0.000	0.000	54.144	0.000	0.772
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	50.939	0.000	0.900
T9	200.00-180.00	A	1.787	0.000	0.000	53.803	0.000	0.762
		B		0.000	0.000	30.424	0.000	0.490
		C		0.000	0.000	50.579	0.000	0.889
T10	180.00-160.00	A	1.767	0.000	0.000	62.807	0.000	0.842
		B		0.000	0.000	100.927	0.000	1.617
		C		0.000	0.000	56.195	0.000	0.897
T11	160.00-140.00	A	1.745	0.000	0.000	98.503	0.000	1.216
		B		0.000	0.000	100.385	0.000	1.600
		C		0.000	0.000	57.190	0.000	0.889
T12	140.00-120.00	A	1.720	0.000	0.000	98.510	0.000	1.207
		B		0.000	0.000	121.137	0.000	1.850
		C		0.000	0.000	56.619	0.000	0.874
T13	120.00-100.00	A	1.692	0.000	0.000	97.461	0.000	1.182
		B		0.000	0.000	129.402	0.000	1.937
		C		0.000	0.000	55.962	0.000	0.858
T14	100.00-80.00	A	1.658	0.000	0.000	96.225	0.000	1.153
		B		0.000	0.000	128.353	0.000	1.904
		C		0.000	0.000	55.187	0.000	0.839
T15	80.00-60.00	A	1.617	0.000	0.000	94.711	0.000	1.117
		B		0.000	0.000	127.068	0.000	1.864
		C		0.000	0.000	54.238	0.000	0.816

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T16	60.00-40.00	A	1.564	0.000	0.000	92.744	0.000	1.072
		B		0.000	0.000	125.398	0.000	1.813
		C		0.000	0.000	53.005	0.000	0.787
T17	40.00-20.00	A	1.486	0.000	0.000	89.883	0.000	1.008
		B		0.000	0.000	122.971	0.000	1.739
		C		0.000	0.000	51.210	0.000	0.746
T18	20.00-0.00	A	1.331	0.000	0.000	84.211	0.000	0.887
		B		0.000	0.000	118.162	0.000	1.597
		C		0.000	0.000	47.647	0.000	0.669

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	350.00-340.00	-1.3372	-0.3057	-2.1515	0.9539
T2	340.00-320.00	-2.8616	0.4458	-3.9371	2.2178
T3	320.00-300.00	-3.8281	-0.7662	-5.6618	1.4449
T4	300.00-280.00	-4.3542	-0.8678	-7.3378	1.8853
T5	280.00-260.00	-5.0290	-1.0051	-8.6858	2.2377
T6	260.00-240.00	-5.0100	-1.0061	-9.4059	2.4364
T7	240.00-220.00	-5.8037	-1.1649	-10.5384	2.7177
T8	220.00-200.00	-6.1329	-1.2319	-11.3049	2.9100
T9	200.00-180.00	-2.8032	-1.8199	-7.5548	1.7453
T10	180.00-160.00	2.7135	-3.4141	-0.9526	-1.0639
T11	160.00-140.00	1.3062	-4.6514	-3.9703	-3.7537
T12	140.00-120.00	2.4857	-7.9492	-3.2901	-6.6712
T13	120.00-100.00	2.9994	-9.3161	-2.8844	-8.0436
T14	100.00-80.00	3.1032	-9.7032	-2.9636	-8.4612
T15	80.00-60.00	2.8900	-9.1968	-2.8702	-8.5108
T16	60.00-40.00	2.9527	-9.4444	-2.8637	-8.8555
T17	40.00-20.00	2.9615	-9.5374	-2.7453	-9.1376
T18	20.00-0.00	2.9663	-9.6123	-2.4680	-9.4995

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	7/8	340.00 - 350.00	0.6000	0.4718
T1	4	1 1/4	340.00 - 350.00	0.6000	0.4718
T1	7	Feedline Ladder (Af)	340.00 - 350.00	0.6000	0.4718
T1	17	Climbing Ladder	340.00 - 350.00	0.6000	0.4718
T1	19	1 1/4	340.00 - 341.00	0.6000	0.4718
T1	20	Feedline Ladder (Af)	340.00 - 341.00	0.6000	0.4718
T1	23	0.62" S.O. Cord	340.00 -	0.6000	0.4718

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	24	0.25" Cable	340.00 - 350.00	0.6000	0.4718
T2	1	7/8	320.00 - 340.00	0.6000	0.4940
T2	4	1 1/4	320.00 - 340.00	0.6000	0.4940
T2	7	Feedline Ladder (Af)	320.00 - 340.00	0.6000	0.4940
T2	17	Climbing Ladder	320.00 - 340.00	0.6000	0.4940
T2	19	1 1/4	320.00 - 340.00	0.6000	0.4940
T2	20	Feedline Ladder (Af)	320.00 - 340.00	0.6000	0.4940
T2	23	0.62" S.O. Cord	320.00 - 340.00	0.6000	0.4940
T2	24	0.25" Cable	320.00 - 340.00	0.6000	0.4940
T3	1	7/8	300.00 - 320.00	0.6000	0.5750
T3	4	1 1/4	300.00 - 320.00	0.6000	0.5750
T3	5	1 1/4	300.00 - 320.00	0.6000	0.5750
T3	7	Feedline Ladder (Af)	300.00 - 320.00	0.6000	0.5750
T3	17	Climbing Ladder	300.00 - 320.00	0.6000	0.5750
T3	19	1 1/4	300.00 - 320.00	0.6000	0.5750
T3	20	Feedline Ladder (Af)	300.00 - 320.00	0.6000	0.5750
T3	23	0.62" S.O. Cord	300.00 - 320.00	0.6000	0.5750
T3	24	0.25" Cable	300.00 - 320.00	0.6000	0.5750
T4	1	7/8	280.00 - 300.00	0.6000	0.6000
T4	4	1 1/4	280.00 - 300.00	0.6000	0.6000
T4	5	1 1/4	280.00 - 300.00	0.6000	0.6000
T4	7	Feedline Ladder (Af)	280.00 - 300.00	0.6000	0.6000
T4	17	Climbing Ladder	280.00 - 300.00	0.6000	0.6000
T4	19	1 1/4	280.00 - 300.00	0.6000	0.6000
T4	20	Feedline Ladder (Af)	280.00 - 300.00	0.6000	0.6000
T4	23	0.62" S.O. Cord	280.00 - 300.00	0.6000	0.6000
T4	24	0.25" Cable	280.00 - 300.00	0.6000	0.6000
T5	1	7/8	260.00 - 280.00	0.6000	0.6000
T5	4	1 1/4	260.00 - 280.00	0.6000	0.6000
T5	5	1 1/4	260.00 - 280.00	0.6000	0.6000
T5	7	Feedline Ladder (Af)	260.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	17	Climbing Ladder	260.00 - 280.00	0.6000	0.6000
T5	19	1 1/4	260.00 - 280.00	0.6000	0.6000
T5	20	Feedline Ladder (Af)	260.00 - 280.00	0.6000	0.6000
T5	23	0.62" S.O. Cord	260.00 - 280.00	0.6000	0.6000
T5	24	0.25" Cable	260.00 - 280.00	0.6000	0.6000
T6	1	7/8	240.00 - 260.00	0.6000	0.6000
T6	4	1 1/4	240.00 - 260.00	0.6000	0.6000
T6	5	1 1/4	240.00 - 260.00	0.6000	0.6000
T6	7	Feedline Ladder (Af)	240.00 - 260.00	0.6000	0.6000
T6	17	Climbing Ladder	240.00 - 260.00	0.6000	0.6000
T6	19	1 1/4	240.00 - 260.00	0.6000	0.6000
T6	20	Feedline Ladder (Af)	240.00 - 260.00	0.6000	0.6000
T6	23	0.62" S.O. Cord	240.00 - 260.00	0.6000	0.6000
T6	24	0.25" Cable	240.00 - 260.00	0.6000	0.6000
T7	1	7/8	220.00 - 240.00	0.6000	0.6000
T7	4	1 1/4	220.00 - 240.00	0.6000	0.6000
T7	5	1 1/4	220.00 - 240.00	0.6000	0.6000
T7	7	Feedline Ladder (Af)	220.00 - 240.00	0.6000	0.6000
T7	17	Climbing Ladder	220.00 - 240.00	0.6000	0.6000
T7	19	1 1/4	220.00 - 240.00	0.6000	0.6000
T7	20	Feedline Ladder (Af)	220.00 - 240.00	0.6000	0.6000
T7	23	0.62" S.O. Cord	220.00 - 240.00	0.6000	0.6000
T7	24	0.25" Cable	220.00 - 240.00	0.6000	0.6000
T8	1	7/8	200.00 - 220.00	0.6000	0.6000
T8	4	1 1/4	200.00 - 220.00	0.6000	0.6000
T8	5	1 1/4	200.00 - 220.00	0.6000	0.6000
T8	7	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T8	17	Climbing Ladder	200.00 - 220.00	0.6000	0.6000
T8	19	1 1/4	200.00 - 220.00	0.6000	0.6000
T8	20	Feedline Ladder (Af)	200.00 - 220.00	0.6000	0.6000
T8	23	0.62" S.O. Cord	200.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			220.00		
T8	24	0.25" Cable	200.00 - 220.00	0.6000	0.6000
T9	1	7/8	180.00 - 200.00	0.6000	0.6000
T9	4	1 1/4	180.00 - 200.00	0.6000	0.6000
T9	5	1 1/4	180.00 - 200.00	0.6000	0.6000
T9	7	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T9	9	1-5/8"	180.00 - 186.00	0.6000	0.6000
T9	10	3/4" DC Power	180.00 - 186.00	0.6000	0.6000
T9	11	1/2" Fiber	180.00 - 186.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	180.00 - 186.00	0.6000	0.6000
T9	17	Climbing Ladder	180.00 - 200.00	0.6000	0.6000
T9	19	1 1/4	180.00 - 200.00	0.6000	0.6000
T9	20	Feedline Ladder (Af)	180.00 - 200.00	0.6000	0.6000
T9	23	0.62" S.O. Cord	180.00 - 200.00	0.6000	0.6000
T9	24	0.25" Cable	180.00 - 200.00	0.6000	0.6000
T10	1	7/8	160.00 - 180.00	0.6000	0.6000
T10	3	1/2	160.00 - 165.00	0.6000	0.6000
T10	4	1 1/4	160.00 - 180.00	0.6000	0.6000
T10	5	1 1/4	160.00 - 180.00	0.6000	0.6000
T10	6	1/2	160.00 - 165.00	0.6000	0.6000
T10	7	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T10	9	1-5/8"	160.00 - 180.00	0.6000	0.6000
T10	10	3/4" DC Power	160.00 - 180.00	0.6000	0.6000
T10	11	1/2" Fiber	160.00 - 180.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T10	17	Climbing Ladder	160.00 - 180.00	0.6000	0.6000
T10	19	1 1/4	160.00 - 180.00	0.6000	0.6000
T10	20	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T10	22	0.62" S.O. Cord	160.00 - 176.00	0.6000	0.6000
T10	23	0.62" S.O. Cord	176.00 - 180.00	0.6000	0.6000
T10	24	0.25" Cable	160.00 - 180.00	0.6000	0.6000
T11	1	7/8	140.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			160.00		
T11	2	7/8	140.00 - 158.00	0.6000	0.6000
T11	3	1/2	140.00 - 160.00	0.6000	0.6000
T11	4	1 1/4	140.00 - 160.00	0.6000	0.6000
T11	5	1 1/4	140.00 - 160.00	0.6000	0.6000
T11	6	1/2	140.00 - 160.00	0.6000	0.6000
T11	7	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T11	9	1-5/8"	140.00 - 160.00	0.6000	0.6000
T11	10	3/4" DC Power	140.00 - 160.00	0.6000	0.6000
T11	11	1/2" Fiber	140.00 - 160.00	0.6000	0.6000
T11	13	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T11	17	Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T11	19	1 1/4	140.00 - 160.00	0.6000	0.6000
T11	20	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T11	22	0.62" S.O. Cord	140.00 - 160.00	0.6000	0.6000
T11	24	0.25" Cable	140.00 - 160.00	0.6000	0.6000
T12	1	7/8	120.00 - 140.00	0.6000	0.6000
T12	2	7/8	120.00 - 140.00	0.6000	0.6000
T12	3	1/2	120.00 - 140.00	0.6000	0.6000
T12	4	1 1/4	120.00 - 140.00	0.6000	0.6000
T12	5	1 1/4	120.00 - 140.00	0.6000	0.6000
T12	6	1/2	120.00 - 140.00	0.6000	0.6000
T12	7	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T12	9	1-5/8"	120.00 - 140.00	0.6000	0.6000
T12	10	3/4" DC Power	120.00 - 140.00	0.6000	0.6000
T12	11	1/2" Fiber	120.00 - 140.00	0.6000	0.6000
T12	13	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T12	15	1 1/4	120.00 - 134.00	0.6000	0.6000
T12	17	Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T12	19	1 1/4	120.00 - 140.00	0.6000	0.6000
T12	20	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T12	22	0.62" S.O. Cord	120.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			140.00		
T12	24	0.25" Cable	120.00 - 140.00	0.6000	0.6000
T13	1	7/8	100.00 - 120.00	0.6000	0.6000
T13	2	7/8	100.00 - 120.00	0.6000	0.6000
T13	3	1/2	100.00 - 120.00	0.6000	0.6000
T13	4	1 1/4	100.00 - 120.00	0.6000	0.6000
T13	5	1 1/4	100.00 - 120.00	0.6000	0.6000
T13	6	1/2	100.00 - 120.00	0.6000	0.6000
T13	7	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T13	9	1-5/8"	100.00 - 120.00	0.6000	0.6000
T13	10	3/4" DC Power	100.00 - 120.00	0.6000	0.6000
T13	11	1/2" Fiber	100.00 - 120.00	0.6000	0.6000
T13	13	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T13	15	1 1/4	100.00 - 120.00	0.6000	0.6000
T13	17	Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T13	19	1 1/4	100.00 - 120.00	0.6000	0.6000
T13	20	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T13	22	0.62" S.O. Cord	100.00 - 120.00	0.6000	0.6000
T13	24	0.25" Cable	100.00 - 120.00	0.6000	0.6000
T14	1	7/8	80.00 - 100.00	0.6000	0.6000
T14	2	7/8	80.00 - 100.00	0.6000	0.6000
T14	3	1/2	80.00 - 100.00	0.6000	0.6000
T14	4	1 1/4	80.00 - 100.00	0.6000	0.6000
T14	5	1 1/4	80.00 - 100.00	0.6000	0.6000
T14	6	1/2	80.00 - 100.00	0.6000	0.6000
T14	7	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T14	9	1-5/8"	80.00 - 100.00	0.6000	0.6000
T14	10	3/4" DC Power	80.00 - 100.00	0.6000	0.6000
T14	11	1/2" Fiber	80.00 - 100.00	0.6000	0.6000
T14	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T14	15	1 1/4	80.00 - 100.00	0.6000	0.6000
T14	17	Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T14	19	1 1/4	80.00 - 100.00	0.6000	0.6000
T14	20	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T14	22	0.62" S.O. Cord	80.00 - 100.00	0.6000	0.6000
T14	24	0.25" Cable	80.00 - 100.00	0.6000	0.6000
T15	1	7/8	60.00 - 80.00	0.6000	0.6000
T15	2	7/8	60.00 - 80.00	0.6000	0.6000
T15	3	1/2	60.00 - 80.00	0.6000	0.6000
T15	4	1 1/4	60.00 - 80.00	0.6000	0.6000
T15	5	1 1/4	60.00 - 80.00	0.6000	0.6000
T15	6	1/2	60.00 - 80.00	0.6000	0.6000
T15	7	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T15	9	1-5/8"	60.00 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	10	3/4" DC Power	60.00 - 80.00	0.6000	0.6000
T15	11	1/2" Fiber	60.00 - 80.00	0.6000	0.6000
T15	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T15	15	1 1/4	60.00 - 80.00	0.6000	0.6000
T15	17	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T15	19	1 1/4	60.00 - 80.00	0.6000	0.6000
T15	20	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T15	22	0.62" S.O. Cord	60.00 - 80.00	0.6000	0.6000
T15	24	0.25" Cable	60.00 - 80.00	0.6000	0.6000
T16	1	7/8	40.00 - 60.00	0.6000	0.6000
T16	2	7/8	40.00 - 60.00	0.6000	0.6000
T16	3	1/2	40.00 - 60.00	0.6000	0.6000
T16	4	1 1/4	40.00 - 60.00	0.6000	0.6000
T16	5	1 1/4	40.00 - 60.00	0.6000	0.6000
T16	6	1/2	40.00 - 60.00	0.6000	0.6000
T16	7	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T16	9	1-5/8"	40.00 - 60.00	0.6000	0.6000
T16	10	3/4" DC Power	40.00 - 60.00	0.6000	0.6000
T16	11	1/2" Fiber	40.00 - 60.00	0.6000	0.6000
T16	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T16	15	1 1/4	40.00 - 60.00	0.6000	0.6000
T16	17	Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T16	19	1 1/4	40.00 - 60.00	0.6000	0.6000
T16	20	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T16	22	0.62" S.O. Cord	40.00 - 60.00	0.6000	0.6000
T16	24	0.25" Cable	40.00 - 60.00	0.6000	0.6000
T17	1	7/8	20.00 - 40.00	0.6000	0.6000
T17	2	7/8	20.00 - 40.00	0.6000	0.6000
T17	3	1/2	20.00 - 40.00	0.6000	0.6000
T17	4	1 1/4	20.00 - 40.00	0.6000	0.6000
T17	5	1 1/4	20.00 - 40.00	0.6000	0.6000
T17	6	1/2	20.00 - 40.00	0.6000	0.6000
T17	7	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T17	9	1-5/8"	20.00 - 40.00	0.6000	0.6000
T17	10	3/4" DC Power	20.00 - 40.00	0.6000	0.6000
T17	11	1/2" Fiber	20.00 - 40.00	0.6000	0.6000
T17	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T17	15	1 1/4	20.00 - 40.00	0.6000	0.6000
T17	17	Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T17	19	1 1/4	20.00 - 40.00	0.6000	0.6000
T17	20	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T17	22	0.62" S.O. Cord	20.00 - 40.00	0.6000	0.6000
T17	24	0.25" Cable	20.00 - 40.00	0.6000	0.6000
T18	1	7/8	0.00 - 20.00	0.6000	0.6000
T18	2	7/8	0.00 - 20.00	0.6000	0.6000
T18	3	1/2	0.00 - 20.00	0.6000	0.6000
T18	4	1 1/4	0.00 - 20.00	0.6000	0.6000
T18	5	1 1/4	0.00 - 20.00	0.6000	0.6000
T18	6	1/2	0.00 - 20.00	0.6000	0.6000
T18	7	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T18	9	1-5/8"	0.00 - 20.00	0.6000	0.6000
T18	10	3/4" DC Power	0.00 - 20.00	0.6000	0.6000
T18	11	1/2" Fiber	0.00 - 20.00	0.6000	0.6000
T18	13	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T18	15	1 1/4	0.00 - 20.00	0.6000	0.6000
T18	17	Climbing Ladder	0.00 - 20.00	0.6000	0.6000
T18	19	1 1/4	0.00 - 20.00	0.6000	0.6000
T18	20	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T18	22	0.62" S.O. Cord	0.00 - 20.00	0.6000	0.6000
T18	24	0.25" Cable	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770	A	From Leg	3.00	0.0000	186.00	No Ice	5.51	2.93	0.035
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.068
			0.00			1" Ice	6.23	3.63	0.105
7770	B	From Leg	3.00	0.0000	186.00	No Ice	5.51	2.93	0.035
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.068
			0.00			1" Ice	6.23	3.63	0.105
7770	C	From Leg	3.00	0.0000	186.00	No Ice	5.51	2.93	0.035
(AT&T)			0.00			1/2" Ice	5.87	3.27	0.068
			0.00			1" Ice	6.23	3.63	0.105
AM-X-CD-16-65-00T-RET	A	From Leg	3.00	0.0000	186.00	No Ice	6.04	4.11	0.033
(AT&T)			0.00			1/2" Ice	6.41	4.45	0.074
			0.00			1" Ice	6.77	4.80	0.121
800-10121	A	From Leg	3.00	0.0000	186.00	No Ice	5.16	3.29	0.046
(AT&T)			0.00			1/2" Ice	5.51	3.64	0.079
			0.00			1" Ice	5.87	3.99	0.117
800-10121	B	From Leg	3.00	0.0000	186.00	No Ice	5.16	3.29	0.046
(AT&T)			0.00			1/2" Ice	5.51	3.64	0.079
			0.00			1" Ice	5.87	3.99	0.117
HPA-65R-BUU-H6	A	From Leg	3.00	0.0000	186.00	No Ice	9.49	5.49	0.043
(AT&T)			0.00			1/2" Ice	9.96	5.94	0.100
			0.00			1" Ice	10.43	6.41	0.164
HPA-65R-BUU-H6	B	From Leg	3.00	0.0000	186.00	No Ice	9.49	5.49	0.043
(AT&T)			0.00			1/2" Ice	9.96	5.94	0.100
			0.00			1" Ice	10.43	6.41	0.164
HPA-65R-BUU-H6	C	From Leg	3.00	0.0000	186.00	No Ice	9.49	5.49	0.043
(AT&T)			0.00			1/2" Ice	9.96	5.94	0.100
			0.00			1" Ice	10.43	6.41	0.164
EPBQ-654L8-H8-L2	A	From Leg	3.00	0.0000	186.00	No Ice	18.09	7.03	0.086
(AT&T)			0.00			1/2" Ice	18.72	7.62	0.179
			0.00			1" Ice	19.36	8.21	0.281
EPBQ-654L8-H8-L2	B	From Leg	3.00	0.0000	186.00	No Ice	18.09	7.03	0.086
(AT&T)			0.00			1/2" Ice	18.72	7.62	0.179
			0.00			1" Ice	19.36	8.21	0.281
EPBQ-654L8-H8-L2	C	From Leg	3.00	0.0000	186.00	No Ice	18.09	7.03	0.086
(AT&T)			0.00			1/2" Ice	18.72	7.62	0.179
			0.00			1" Ice	19.36	8.21	0.281
(2) CCI	A	From Leg	3.00	0.0000	186.00	No Ice	0.56	0.34	0.020
DTMA-BP7819VG12A			0.00			1/2" Ice	0.66	0.43	0.025
(AT&T)			0.00			1" Ice	0.77	0.52	0.030
(2) CCI	B	From Leg	3.00	0.0000	186.00	No Ice	0.56	0.34	0.020
DTMA-BP7819VG12A			0.00			1/2" Ice	0.66	0.43	0.025
(AT&T)			0.00			1" Ice	0.77	0.52	0.030
(2) CCI	C	From Leg	3.00	0.0000	186.00	No Ice	0.56	0.34	0.020
DTMA-BP7819VG12A			0.00			1/2" Ice	0.66	0.43	0.025
(AT&T)			0.00			1" Ice	0.77	0.52	0.030
860 10125 RET	A	From Leg	3.00	0.0000	186.00	No Ice	0.14	0.12	0.001
(AT&T)			0.00			1/2" Ice	0.20	0.17	0.003
			0.00			1" Ice	0.26	0.23	0.005
(2) 860 10125 RET	A	From Leg	3.00	0.0000	186.00	No Ice	0.14	0.12	0.001

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)			0.00				1/2" Ice	0.20	0.17	0.003
			0.00				1" Ice	0.26	0.23	0.005
860 10125 RET	A	From Leg	3.00		0.0000	186.00	No Ice	0.14	0.12	0.001
(AT&T)			0.00				1/2" Ice	0.20	0.17	0.003
			0.00				1" Ice	0.26	0.23	0.005
RRUS 11	A	From Leg	3.00		0.0000	186.00	No Ice	2.52	1.02	0.055
(AT&T)			0.00				1/2" Ice	2.72	1.16	0.074
			0.00				1" Ice	2.92	1.30	0.097
RRUS 11	B	From Leg	3.00		0.0000	186.00	No Ice	2.52	1.02	0.055
(AT&T)			0.00				1/2" Ice	2.72	1.16	0.074
			0.00				1" Ice	2.92	1.30	0.097
RRUS 11	C	From Leg	3.00		0.0000	186.00	No Ice	2.52	1.02	0.055
(AT&T)			0.00				1/2" Ice	2.72	1.16	0.074
			0.00				1" Ice	2.92	1.30	0.097
RRUS 32	A	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
RRUS 32	B	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
RRUS 32	C	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
RRUS 4478 B5	A	From Leg	3.00		0.0000	186.00	No Ice	1.84	1.06	0.060
(AT&T)			0.00				1/2" Ice	2.01	1.20	0.076
			0.00				1" Ice	2.19	1.34	0.094
RRUS 4478 B5	B	From Leg	3.00		0.0000	186.00	No Ice	1.84	1.06	0.060
(AT&T)			0.00				1/2" Ice	2.01	1.20	0.076
			0.00				1" Ice	2.19	1.34	0.094
RRUS 4478 B5	C	From Leg	3.00		0.0000	186.00	No Ice	1.84	1.06	0.060
(AT&T)			0.00				1/2" Ice	2.01	1.20	0.076
			0.00				1" Ice	2.19	1.34	0.094
RRUS 4426	A	From Leg	3.00		0.0000	186.00	No Ice	1.52	0.73	0.049
(AT&T)			0.00				1/2" Ice	1.68	0.84	0.061
			0.00				1" Ice	1.84	0.97	0.075
RRUS 4426	B	From Leg	3.00		0.0000	186.00	No Ice	1.52	0.73	0.049
(AT&T)			0.00				1/2" Ice	1.68	0.84	0.061
			0.00				1" Ice	1.84	0.97	0.075
RRUS 4426	C	From Leg	3.00		0.0000	186.00	No Ice	1.52	0.73	0.049
(AT&T)			0.00				1/2" Ice	1.68	0.84	0.061
			0.00				1" Ice	1.84	0.97	0.075
RRUS 32 B66	A	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
RRUS 32 B66	B	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
RRUS 32 B66	C	From Leg	3.00		0.0000	186.00	No Ice	2.32	1.65	0.077
(AT&T)			0.00				1/2" Ice	2.51	1.83	0.098
			0.00				1" Ice	2.71	2.01	0.122
(2) LGP13519 Diplexer	A	From Leg	3.00		0.0000	186.00	No Ice	0.29	0.18	0.005
(AT&T)			0.00				1/2" Ice	0.36	0.24	0.008
			0.00				1" Ice	0.44	0.31	0.012
(2) LGP13519 Diplexer	B	From Leg	3.00		0.0000	186.00	No Ice	0.29	0.18	0.005
(AT&T)			0.00				1/2" Ice	0.36	0.24	0.008
			0.00				1" Ice	0.44	0.31	0.012
(2) LGP13519 Diplexer	C	From Leg	3.00		0.0000	186.00	No Ice	0.29	0.18	0.005

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)			0.00			1/2" Ice	0.36	0.24	0.008
			0.00			1" Ice	0.44	0.31	0.012
DC6-48-60-18-8F	B	From Leg	3.00	0.0000	186.00	No Ice	2.20	3.70	0.020
(AT&T)			0.00			1/2" Ice	2.40	3.94	0.030
			0.00			1" Ice	2.60	4.19	0.040
DC6-48-60-18-8F	C	From Leg	3.00	0.0000	186.00	No Ice	2.20	3.70	0.020
(AT&T)			0.00			1/2" Ice	2.40	3.94	0.030
			0.00			1" Ice	2.60	4.19	0.040
13.5' T-Frames	A	From Leg	1.50	0.0000	186.00	No Ice	10.12	9.05	0.240
(AT&T)			0.00			1/2" Ice	14.43	11.89	0.340
			0.00			1" Ice	18.74	14.73	0.440
13.5' T-Frames	B	From Leg	1.50	0.0000	186.00	No Ice	10.12	9.05	0.240
(AT&T)			0.00			1/2" Ice	14.43	11.89	0.340
			0.00			1" Ice	18.74	14.73	0.440
13.5' T-Frames	C	From Leg	1.50	0.0000	186.00	No Ice	10.12	9.05	0.240
(AT&T)			0.00			1/2" Ice	14.43	11.89	0.340
			0.00			1" Ice	18.74	14.73	0.440
*****									
Celwave PD200 Omni	A	From Leg	3.00	0.0000	350.00	No Ice	2.73	2.73	0.020
(LoJack)			0.00			1/2" Ice	3.91	3.91	0.040
			10.00			1" Ice	5.09	5.10	0.068
101 Omni	B	From Leg	3.00	0.0000	350.00	No Ice	2.14	2.14	0.020
(Marcus)			0.00			1/2" Ice	3.06	3.06	0.040
			5.00			1" Ice	5.10	3.99	0.068
Star Mount w/ (9) Standoffs	A	From Leg	1.50	0.0000	350.00	No Ice	28.57	28.57	0.568
(Marcus/LoJack)			0.00			1/2" Ice	35.34	35.34	0.863
			0.00			1" Ice	42.11	42.11	1.158
****									
101 Omni	A	From Leg	3.00	0.0000	320.00	No Ice	2.14	2.14	0.020
(Marcus)			0.00			1/2" Ice	3.06	3.06	0.040
			5.00			1" Ice	5.10	3.99	0.068
101 Omni	B	From Leg	3.00	0.0000	320.00	No Ice	2.14	2.14	0.020
(Marcus)			0.00			1/2" Ice	3.06	3.06	0.040
			5.00			1" Ice	5.10	3.99	0.068
6' Standoff	A	From Leg	1.50	0.0000	320.00	No Ice	4.97	3.20	0.070
(Marcus)			0.00			1/2" Ice	6.12	5.12	0.130
			0.00			1" Ice	7.27	7.04	0.190
6' Standoff	B	From Leg	1.50	0.0000	320.00	No Ice	4.97	3.20	0.070
(Marcus)			0.00			1/2" Ice	6.12	5.12	0.130
			0.00			1" Ice	7.27	7.04	0.190
*****									
Decibel DB408 Omni	A	From Leg	3.00	0.0000	158.00	No Ice	1.60	1.60	0.020
(Wolcott Ambulance)			0.00			1/2" Ice	2.42	2.42	0.032
			5.00			1" Ice	3.24	3.24	0.050
17" Standoff Mount	B	From Leg	1.50	0.0000	158.00	No Ice	0.73	0.73	0.027
(Wolcott)			0.00			1/2" Ice	0.91	0.91	0.035
			0.00			1" Ice	1.09	1.09	0.046
****									
APXVTM14-C-I20	A	From Leg	3.00	0.0000	134.00	No Ice	6.34	3.61	0.056
(Sprint)			0.00			1/2" Ice	6.72	3.97	0.096
			0.00			1" Ice	7.10	4.33	0.140
APXVTM14-C-I20	B	From Leg	3.00	0.0000	134.00	No Ice	6.34	3.61	0.056
(Sprint)			0.00			1/2" Ice	6.72	3.97	0.096
			0.00			1" Ice	7.10	4.33	0.140
APXVTM14-C-I20	C	From Leg	3.00	0.0000	134.00	No Ice	6.34	3.61	0.056
(Sprint)			0.00			1/2" Ice	6.72	3.97	0.096
			0.00			1" Ice	7.10	4.33	0.140

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RFS APXVSPP18	A	From Leg	3.00	0.0000	134.00	No Ice	8.02	5.28	0.057
(Sprint)			0.00			1/2" Ice	8.48	5.74	0.107
			0.00			1" Ice	8.94	6.20	0.162
RFS APXVSPP18	B	From Leg	3.00	0.0000	134.00	No Ice	8.02	5.28	0.057
(Sprint)			0.00			1/2" Ice	8.48	5.74	0.107
			0.00			1" Ice	8.94	6.20	0.162
RFS APXVSPP18	C	From Leg	3.00	0.0000	134.00	No Ice	8.02	5.28	0.057
(Sprint)			0.00			1/2" Ice	8.48	5.74	0.107
			0.00			1" Ice	8.94	6.20	0.162
RRH 1900 MHz	A	From Leg	3.00	0.0000	134.00	No Ice	1.22	1.87	0.043
(Sprint)			0.00			1/2" Ice	1.37	2.05	0.059
			0.00			1" Ice	1.52	2.24	0.077
RRH 1900 MHz	B	From Leg	3.00	0.0000	134.00	No Ice	1.22	1.87	0.043
(Sprint)			0.00			1/2" Ice	1.37	2.05	0.059
			0.00			1" Ice	1.52	2.24	0.077
RRH 1900 MHz	C	From Leg	3.00	0.0000	134.00	No Ice	1.22	1.87	0.043
(Sprint)			0.00			1/2" Ice	1.37	2.05	0.059
			0.00			1" Ice	1.52	2.24	0.077
RRH 800 MHz	A	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
RRH 800 MHz	B	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
RRH 800 MHz	C	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
TD-RRH8x20-25	A	From Leg	3.00	0.0000	134.00	No Ice	3.70	1.29	0.066
(Sprint)			0.00			1/2" Ice	3.95	1.46	0.090
			0.00			1" Ice	4.20	1.64	0.117
TD-RRH8x20-25	B	From Leg	3.00	0.0000	134.00	No Ice	3.70	1.29	0.066
(Sprint)			0.00			1/2" Ice	3.95	1.46	0.090
			0.00			1" Ice	4.20	1.64	0.117
TD-RRH8x20-25	C	From Leg	3.00	0.0000	134.00	No Ice	3.70	1.29	0.066
(Sprint)			0.00			1/2" Ice	3.95	1.46	0.090
			0.00			1" Ice	4.20	1.64	0.117
RRH 800 MHz Filter	A	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
RRH 800 MHz Filter	B	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
RRH 800 MHz Filter	C	From Leg	3.00	0.0000	134.00	No Ice	1.73	1.37	0.048
(Sprint)			0.00			1/2" Ice	1.90	1.52	0.065
			0.00			1" Ice	2.07	1.68	0.084
(2) ACU-A20-N	A	From Leg	3.00	0.0000	134.00	No Ice	0.07	0.12	0.001
(Sprint)			0.00			1/2" Ice	0.10	0.16	0.002
			0.00			1" Ice	0.15	0.21	0.004
ACU-A20-N	B	From Leg	3.00	0.0000	134.00	No Ice	0.07	0.12	0.001
(Sprint)			0.00			1/2" Ice	0.10	0.16	0.002
			0.00			1" Ice	0.15	0.21	0.004
ACU-A20-N	C	From Leg	3.00	0.0000	134.00	No Ice	0.07	0.12	0.001
(Sprint)			0.00			1/2" Ice	0.10	0.16	0.002
			0.00			1" Ice	0.15	0.21	0.004
15' T-Frames	A	From Leg	1.50	0.0000	134.00	No Ice	11.22	10.08	0.370
(Sprint)			0.00			1/2" Ice	15.70	14.58	0.530
			0.00			1" Ice	20.18	19.08	0.690

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft²	C_AA_A *Side* ft²	*Weight* K
15' T-Frames	B	From Leg	1.50	0.0000	134.00	No Ice	11.22	10.08	0.370
(Sprint)			0.00			1/2" Ice	15.70	14.58	0.530
			0.00			1" Ice	20.18	19.08	0.690
15' T-Frames	C	From Leg	1.50	0.0000	134.00	No Ice	11.22	10.08	0.370
(Sprint)			0.00			1/2" Ice	15.70	14.58	0.530
			0.00			1" Ice	20.18	19.08	0.690
*****									
(2) Pipe Mounts (5.25' x 4.5")	A	From Leg	0.50	0.0000	165.00	No Ice	0.84	1.69	0.057
(Marcus)			0.00			1/2" Ice	1.10	2.21	0.074
			0.00			1" Ice	1.36	2.54	0.094
(2) Pipe Mounts (5.25' x 4.5")	A	From Leg	0.50	0.0000	165.00	No Ice	0.84	1.69	0.057
(Marcus)			0.00			1/2" Ice	1.10	2.21	0.074
			0.00			1" Ice	1.36	2.54	0.094
(2) Pipe Mounts (5.25' x 4.5")	A	From Leg	0.50	0.0000	165.00	No Ice	0.84	1.69	0.057
(Marcus)			0.00			1/2" Ice	1.10	2.21	0.074
			0.00			1" Ice	1.36	2.54	0.094
****									
800 10622	A	From Leg	3.00	0.0000	341.00	No Ice	6.31	1.98	0.052
(Dish Network)			0.00			1/2" Ice	6.68	2.32	0.083
			0.00			1" Ice	7.06	2.66	0.119
800 10622	B	From Leg	3.00	0.0000	341.00	No Ice	6.31	1.98	0.052
(Dish Network)			0.00			1/2" Ice	6.68	2.32	0.083
			0.00			1" Ice	7.06	2.66	0.119
800 10622	C	From Leg	3.00	0.0000	341.00	No Ice	6.31	1.98	0.052
(Dish Network)			0.00			1/2" Ice	6.68	2.32	0.083
			0.00			1" Ice	7.06	2.66	0.119
4415	A	From Leg	3.00	0.0000	341.00	No Ice	1.86	0.83	0.046
(Dish Network)			0.00			1/2" Ice	2.03	0.96	0.061
			0.00			1" Ice	2.20	1.09	0.077
4415	B	From Leg	3.00	0.0000	341.00	No Ice	1.86	0.83	0.046
(Dish Network)			0.00			1/2" Ice	2.03	0.96	0.061
			0.00			1" Ice	2.20	1.09	0.077
4415	C	From Leg	3.00	0.0000	341.00	No Ice	1.86	0.83	0.046
(Dish Network)			0.00			1/2" Ice	2.03	0.96	0.061
			0.00			1" Ice	2.20	1.09	0.077
0208	A	From Leg	3.00	0.0000	341.00	No Ice	1.36	0.48	0.020
(Dish Network)			0.00			1/2" Ice	1.50	0.58	0.029
			0.00			1" Ice	1.66	0.68	0.041
0208	B	From Leg	3.00	0.0000	341.00	No Ice	1.36	0.48	0.020
(Dish Network)			0.00			1/2" Ice	1.50	0.58	0.029
			0.00			1" Ice	1.66	0.68	0.041
0208	C	From Leg	3.00	0.0000	341.00	No Ice	1.36	0.48	0.020
(Dish Network)			0.00			1/2" Ice	1.50	0.58	0.029
			0.00			1" Ice	1.66	0.68	0.041
Commscope SF-SU7-2-96	A	From Leg	1.50	0.0000	341.00	No Ice	11.06	8.76	0.395
Sector Frame			0.00			1/2" Ice	17.63	14.51	0.553
(Dish Network)			0.00			1" Ice	24.20	20.26	0.711
Commscope SF-SU7-2-96	B	From Leg	1.50	0.0000	341.00	No Ice	11.06	8.76	0.395
Sector Frame			0.00			1/2" Ice	17.63	14.51	0.553
(Dish Network)			0.00			1" Ice	24.20	20.26	0.711
Commscope SF-SU7-2-96	C	From Leg	1.50	0.0000	341.00	No Ice	11.06	8.76	0.395
Sector Frame			0.00			1/2" Ice	17.63	14.51	0.553
(Dish Network)			0.00			1" Ice	24.20	20.26	0.711

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
Radiowaves SPD3-2.4 Dish (Marcus)	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	3.00	No Ice 1/2" Ice 1" Ice	7.10 7.46 7.83	0.035 0.073 0.112
Radiowaves SPD3-2.4 Dish (Marcus)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	3.00	No Ice 1/2" Ice 1" Ice	7.10 7.46 7.83	0.035 0.073 0.112
Radiowaves SPD3-2.4 Dish (Marcus)	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	3.00	No Ice 1/2" Ice 1" Ice	7.10 7.46 7.83	0.035 0.073 0.112
Radiowaves SPD2-5.8 Dish (Marcus)	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.67	0.022 0.039 0.057
Radiowaves SPD2-5.8 Dish (Marcus)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.67	0.022 0.039 0.057
Radiowaves SPD2-5.8 Dish (Marcus)	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.67	0.022 0.039 0.057

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	350 - 340	6.355	39	0.2138	0.0743
T2	340 - 320	5.907	39	0.2103	0.0599
T3	320 - 300	5.058	39	0.1825	0.0351
T4	300 - 280	4.346	39	0.1536	0.0189
T5	280 - 260	3.728	39	0.1376	0.0126
T6	260 - 240	3.174	39	0.1222	0.0090
T7	240 - 220	2.678	39	0.1092	0.0068
T8	220 - 200	2.238	39	0.0962	0.0059
T9	200 - 180	1.849	39	0.0849	0.0051
T10	180 - 160	1.502	39	0.0749	0.0046
T11	160 - 140	1.191	39	0.0657	0.0040
T12	140 - 120	0.918	47	0.0561	0.0033
T13	120 - 100	0.685	47	0.0471	0.0028
T14	100 - 80	0.488	47	0.0388	0.0023
T15	80 - 60	0.324	47	0.0301	0.0017
T16	60 - 40	0.196	47	0.0221	0.0013
T17	40 - 20	0.101	47	0.0147	0.0009
T18	20 - 0	0.033	47	0.0070	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Celwave PD200 Omni	39	6.355	0.2138	0.0743	292168
341.00	800 10622	39	5.952	0.2110	0.0613	153610

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
320.00	101 Omni	39	5.058	0.1825	0.0351	28717
186.00	7770	39	1.602	0.0777	0.0048	131553
165.00	Radiowaves SPD3-2.4 Dish	39	1.266	0.0680	0.0042	141751
158.00	Decibel DB408 Omni	39	1.162	0.0648	0.0039	136441
134.00	APXVTM14-C-I20	47	0.844	0.0533	0.0031	115203

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	350 - 340	26.480	2	0.8739	0.3109
T2	340 - 320	24.645	2	0.8645	0.2505
T3	320 - 300	21.136	2	0.7575	0.1468
T4	300 - 280	18.171	2	0.6406	0.0792
T5	280 - 260	15.590	3	0.5747	0.0528
T6	260 - 240	13.274	3	0.5110	0.0375
T7	240 - 220	11.198	3	0.4569	0.0286
T8	220 - 200	9.361	3	0.4024	0.0246
T9	200 - 180	7.731	3	0.3549	0.0215
T10	180 - 160	6.283	3	0.3129	0.0193
T11	160 - 140	4.983	3	0.2747	0.0168
T12	140 - 120	3.837	18	0.2347	0.0137
T13	120 - 100	2.862	18	0.1971	0.0116
T14	100 - 80	2.041	18	0.1622	0.0094
T15	80 - 60	1.355	18	0.1260	0.0073
T16	60 - 40	0.821	18	0.0923	0.0055
T17	40 - 20	0.424	18	0.0613	0.0036
T18	20 - 0	0.137	19	0.0293	0.0018

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
350.00	Celwave PD200 Omni	2	26.480	0.8739	0.3109	112322
341.00	800 10622	2	24.828	0.8667	0.2564	55443
320.00	101 Omni	2	21.136	0.7575	0.1468	7191
186.00	7770	3	6.701	0.3250	0.0199	31359
165.00	Radiowaves SPD3-2.4 Dish	3	5.295	0.2843	0.0175	33956
158.00	Decibel DB408 Omni	3	4.861	0.2708	0.0165	32722
134.00	APXVTM14-C-I20	18	3.527	0.2230	0.0130	27562

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	350	Leg	A325N	0.6250	4	0.940	20.709	0.045 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2.144	6.831	0.314 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	0.330	10.440	0.032 ✔	1	Member Bearing
T2	340	Leg	A325N	0.6250	4	7.022	20.709	0.339 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.112	6.831	0.456 ✔	1	Member Block Shear
T3	320	Leg	A325N	0.7500	4	11.047	29.821	0.370 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2.490	6.831	0.365 ✔	1	Member Block Shear
T4	300	Leg	A325N	0.7500	6	9.359	29.821	0.314 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2.192	7.830	0.280 ✔	1	Member Bearing
T5	280	Leg	A325N	0.8750	6	11.412	40.589	0.281 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2.453	7.830	0.313 ✔	1	Member Bearing
T6	260	Leg	A325N	0.8750	6	13.512	40.589	0.333 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2.934	7.830	0.375 ✔	1	Member Bearing
T7	240	Leg	A325N	1.0000	6	15.464	53.014	0.292 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.782	15.660	0.242 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	2.155	7.830	0.275 ✔	1	Member Bearing
T8	220	Leg	A325N	1.1250	6	17.662	67.096	0.263 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	4.264	17.944	0.238 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	2.382	7.830	0.304 ✔	1	Member Bearing
T9	200	Leg	A325N	1.1250	6	19.815	67.096	0.295 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	6.434	18.922	0.340 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	2.636	7.830	0.337 ✔	1	Member Bearing
T10	180	Leg	A325N	1.2500	6	23.014	82.835	0.278 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7.348	18.922	0.388 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	3.095	7.830	0.395 ✔	1	Member Bearing
T11	160	Leg	A325N	1.2500	6	26.424	82.835	0.319 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8.440	18.922	0.446 ✔	1	Member Bearing
		Horizontal	A325N	0.6250	1	3.579	10.440	0.343 ✔	1	Member Bearing
T12	140	Leg	A325N	1.3750	6	28.809	100.230	0.287 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	11.350	25.230	0.450 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	3.955	17.944	0.220 ✔	1	Member Block Shear
T13	120	Leg	A325N	1.3750	6	32.688	100.230	0.326 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	12.280	25.230	0.487 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	4.510	17.944	0.251 ✔	1	Member Block Shear
T14	100	Leg	A325N	1.3750	6	36.322	100.230	0.362 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	12.459	25.230	0.494 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	5.024	17.944	0.280 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T15	80	Leg	A325N	1.5000	6	40.021	119.282	0.336 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	13.245	29.580	0.448 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	5.575	18.922	0.295 ✔	1	Member Bearing
T16	60	Leg	A325N	1.5000	6	43.524	119.282	0.365 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	13.585	29.580	0.459 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	6.103	18.922	0.323 ✔	1	Member Bearing
T17	40	Leg	A325N	1.5000	6	47.174	119.282	0.395 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	14.255	29.580	0.482 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	6.669	25.230	0.264 ✔	1	Member Bearing
T18	20	Leg	A307	2.5000	6	50.732	165.670	0.306 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	14.653	29.580	0.495 ✔	1	Member Bearing
		Horizontal	A325N	0.7500	1	7.229	25.230	0.287 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	2	10.00	5.00	120.0 K=1.00	3.1416	-6.348	49.286	0.129 [1] ✔
T2	340 - 320	2	20.00	4.00	96.0 K=1.00	3.1416	-32.518	72.063	0.451 [1] ✔
T3	320 - 300	2 1/2	20.03	5.01	96.2 K=1.00	4.9087	-51.296	112.346	0.457 [1] ✔
T4	300 - 280	3 1/4	20.03	6.68	98.6 K=1.00	8.2958	-65.920	183.313	0.360 [1] ✔
T5	280 - 260	3 1/4	20.03	6.68	98.6 K=1.00	8.2958	-81.260	183.313	0.443 [1] ✔
T6	260 - 240	3 1/2	20.03	6.68	91.6 K=1.00	9.6211	-97.475	234.484	0.416 [1] ✔
T7	240 - 220	3 1/2	20.03	5.01	68.7 K=1.00	9.6211	-113.322	306.641	0.370 [1] ✔
T8	220 - 200	3 3/4	20.03	5.01	64.1 K=1.00	11.0447	-131.360	368.015	0.357 [1] ✔
T9	200 - 180	4	20.03	5.01	60.1 K=1.00	12.5664	-151.814	434.236	0.350 [1] ✔
T10	180 - 160	4 1/4	20.03	5.01	56.6 K=1.00	14.1863	-178.441	505.220	0.353 [1] ✔
T11	160 - 140	4 1/4	20.03	5.01	56.6 K=1.00	14.1863	-206.384	505.220	0.409 [1] ✔
T12	140 - 120	4 1/2	20.03	5.01	53.4	15.9043	-228.062	580.902	0.393 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T13	120 - 100	4 3/4	20.03	5.01	50.6 K=1.00	17.7205	-260.060	661.231	0.393 [1]
T14	100 - 80	4 3/4	20.03	5.01	50.6 K=1.00	17.7205	-289.717	661.231	0.438 [1]
T15	80 - 60	5	20.03	5.01	48.1 K=1.00	19.6350	-321.487	746.168	0.431 [1]
T16	60 - 40	5 1/4	20.03	5.01	45.8 K=1.00	21.6475	-351.893	835.679	0.421 [1]
T17	40 - 20	5 1/4	20.03	5.01	45.8 K=1.00	21.6475	-384.529	835.679	0.460 [1]
T18	20 - 0	5 1/2	20.03	5.01	43.7 K=1.00	23.7583	-416.844	929.740	0.448 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L2x1 1/2x3/16	6.40	2.95	112.4 K=1.02	0.6211	-2.156	10.346	0.208 [1]
T2	340 - 320	L2x1 1/2x3/16	5.66	2.59	102.4 K=1.06	0.6211	-3.305	11.584	0.285 [1]
T3	320 - 300	L2x2x3/16	6.56	3.22	103.5 K=1.06	0.7148	-2.736	13.174	0.208 [1]
T4	300 - 280	L2-1/2x2-1/2x3/16	10.16	5.00	121.3 K=1.00	0.9023	-2.299	13.474	0.171 [1]
T5	280 - 260	L2-1/2x2-1/2x3/16	11.74	5.79	140.4 K=1.00	0.9023	-2.488	10.341	0.241 [1]
T6	260 - 240	L3x3x3/16	13.44	6.62	133.3 K=1.00	1.0898	-2.939	13.820	0.213 [1]
T7	240 - 220	2L2 1/2x2 1/2x3/16x3/8	8.60	8.18	126.2 K=1.00	1.8000	-3.842	25.202	0.152 [1]
T8	220 - 200	2L2 1/2x2 1/2x3/16x3/8	9.44	8.98	138.5 K=1.00	1.8000	-4.341	21.196	0.205 [1]
T9	200 - 180	2L3x3x3/16x3/8	10.30	9.84	125.7 K=1.00	2.1800	-6.668	30.555	0.218 [1]
T10	180 - 160	2L3x3x3/16x3/8	11.18	10.71	136.9 K=1.00	2.1800	-7.596	26.278	0.289 [1]
T11	160 - 140	2L3x3x3/16x3/8	12.08	11.62	148.5 K=1.00	2.1800	-8.456	22.339	0.379 [1]
T12	140 - 120	2L3x3x1/4x3/8	15.62	15.11	143.9 K=1.00	2.8800	-12.664	31.416	0.403 [1]
T13	120 - 100	2L3x3x1/4x3/8	16.40	15.88	150.0 K=1.00	2.8800	-12.490	28.916	0.432 [1]
T14	100 - 80	2L3x3x1/4x3/8	17.21	16.69	156.4 K=1.00	2.8800	-13.761	26.593	0.517 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T15	80 - 60	2L3 1/2x3 1/2x1/4x3/8	18.03	17.48	141.7 K=1.00	3.3800	-13.718	38.008	0.361 [1] ✔
T16	60 - 40	2L3 1/2x3 1/2x1/4x3/8	18.87	18.31	147.6 K=1.00	3.3800	-15.101	35.047	0.431 [1] ✔
T17	40 - 20	2L3 1/2x3 1/2x1/4x3/8	19.73	19.17	153.7 K=1.00	3.3800	-14.997	32.326	0.464 [1] ✔
T18	20 - 0	2L3 1/2x3 1/2x1/4x3/8	20.59	20.03	159.8 K=1.00	3.3800	-15.968	29.896	0.534 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	240 - 220	L2 1/2x2 1/2x3/16	13.50	6.48	157.2 K=1.00	0.9023	-2.155	8.246	0.261 [1] ✔
T8	220 - 200	L2 1/2x2 1/2x3/16	15.50	7.47	181.2 K=1.00	0.9023	-2.382	6.207	0.384 [1] ✔
T9	200 - 180	L3x3x3/16	17.50	8.46	170.3 K=1.00	1.0898	-2.636	8.488	0.311 [1] ✔
T10	180 - 160	L3x3x3/16	19.50	9.45	190.2 K=1.00	1.0898	-3.095	6.804	0.455 [1] ✔
T11	160 - 140	L3 1/2x3 1/2x1/4	21.50	10.45	180.7 K=1.00	1.6900	-3.579	11.687	0.306 [1] ✔
T12	140 - 120	2L2 1/2x2 1/2x3/16x3/8	23.00	11.18	172.4 K=1.00	1.8000	-3.955	13.682	0.289 [1] ✔
T13	120 - 100	2L2 1/2x2 1/2x3/16x3/8	25.00	12.17	187.7 K=1.00	1.8000	-4.510	11.547	0.391 [1] ✔
T14	100 - 80	2L2 1/2x2 1/2x3/16x3/8	27.00	13.17	203.1 K=1.00	1.8000	-5.024	9.860	0.510 [1] ✔
T15	80 - 60	2L3x3x3/16x3/8	29.00	14.16	180.9 K=1.00	2.1800	-5.575	15.048	0.371 [1] ✔
T16	60 - 40	2L3x3x3/16x3/8	31.00	15.15	193.6 K=1.00	2.1800	-6.103	13.146	0.464 [1] ✔
T17	40 - 20	2L3 1/2x3 1/2x1/4x3/8	33.00	16.15	177.8 K=1.00	3.3800	-6.669	24.167	0.276 [1] ✔
T18	20 - 0	2L3 1/2x3 1/2x1/4x3/8	35.00	17.14	188.6 K=1.00	3.3800	-7.229	21.456	0.337 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L3x3x1/4	4.00	3.59	96.4 K=1.32	1.4400	-0.325	28.598	0.011 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	140 - 120	L2x2x3/16	5.75	5.56	169.5 K=1.00	0.7148	-3.956	5.620	0.704 [1] ✔
T13	120 - 100	L2x2x3/16	6.25	6.05	184.4 K=1.00	0.7148	-4.511	4.748	0.950 [1] ✔
T14	100 - 80	L2x2x3/8	6.75	6.55	202.1 K=1.00	1.3600	-5.025	7.521	0.668 [1] ✔
T15	80 - 60	L2-1/2x2-1/2x3/16	7.25	7.04	170.7 K=1.00	0.9023	-5.577	6.992	0.798 [1] ✔
T16	60 - 40	L2-1/2x2-1/2x3/16	7.75	7.53	182.6 K=1.00	0.9023	-6.104	6.113	0.999 [1] ✔
T17	40 - 20	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower	8.25	8.03	125.4 K=1.00	1.0565	-6.670	14.963	0.446 [1] ✔
T18	20 - 0	L3x3x3/16	8.75	8.52	171.5 K=1.00	1.0898	-7.229	8.374	0.863 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	140 - 120	L2-1/2x2-1/2x3/16	7.81	7.56	183.3 K=1.00	0.9023	-2.687	6.069	0.443 [1] ✔
T13	120 - 100	L2-1/2x2-1/2x3/16	8.20	7.94	192.6 K=1.00	0.9023	-2.960	5.494	0.539 [1] ✔
T14	100 - 80	L2-1/2x2-1/2x3/16	8.60	8.35	202.6 K=1.00	0.9023	-3.203	4.968	0.645 [1] ✔
T15	80 - 60	L3x3x3/16	9.02	8.76	176.3 K=1.00	1.0898	-3.467	7.925	0.438 [1] ✔
T16	60 - 40	L3x3x3/16	9.44	9.17	184.6 K=1.00	1.0898	-3.715	7.227	0.514 [1] ✔
T17	40 - 20	L3x3x3/16	9.86	9.60	193.3 K=1.00	1.0898	-3.987	6.591	0.605 [1] ✔
T18	20 - 0	L3x3x3/16	10.30	10.03	201.9 K=1.00	1.0898	-4.254	6.043	0.704 [1] ✔

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

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	240 - 220	L2 1/2x2 1/2x3/16	6.75	6.75	163.7 K=1.00	0.9023	-0.011	7.609	0.001 [1] ✔
T8	220 - 200	L2 1/2x2 1/2x3/16	7.75	7.75	187.9 K=1.00	0.9023	-0.012	5.772	0.002 [1] ✔
T9	200 - 180	L3x3x3/16	8.75	8.75	176.1 K=1.00	1.0898	-0.015	7.941	0.002 [1] ✔
T10	180 - 160	L3x3x3/16	9.75	9.75	196.2 K=1.00	1.0898	-0.016	6.396	0.003 [1] ✔
T11	160 - 140	L3 1/2x3 1/2x1/4	10.75	10.75	185.9 K=1.00	1.6900	-0.019	11.050	0.002 [1] ✔
T12	140 - 120	L3 1/2x3 1/2x1/4	11.50	11.50	198.8 K=1.00	1.6900	-0.028	9.656	0.003 [1] ✔
T13	120 - 100	L4x4x1/4	12.50	12.50	188.7 K=1.00	1.9400	-0.030	12.311	0.002 [1] ✔
T14	100 - 80	L4x4x1/4	13.50	13.50	203.8 K=1.00	1.9400	-0.031	10.555	0.003 [1] ✔
T15	80 - 60	2L3x3x3/16x3/8	14.50	14.50	185.3 K=1.00	2.1800	-0.037	14.343	0.003 [1] ✔
T16	60 - 40	2L3x3x3/16x3/8	15.50	15.50	198.1 K=1.00	2.1800	-0.038	12.552	0.003 [1] ✔
T17	40 - 20	2L3 1/2x3 1/2x1/4x3/8	16.50	16.50	181.7 K=1.00	3.3800	-0.043	23.141	0.002 [1] ✔
T18	20 - 0	2L3 1/2x3 1/2x1/4x3/8	17.50	17.50	192.7 K=1.00	3.3800	-0.042	20.572	0.002 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	2	10.00	5.00	120.0	3.1416	3.760	141.372	0.027 [1] ✔
T2	340 - 320	2	20.00	4.00	96.0	3.1416	28.089	141.372	0.199 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	320 - 300	2 1/2	20.03	5.01	96.2	4.9087	44.187	220.893	0.200 [1]
T4	300 - 280	3 1/4	20.03	6.68	98.6	8.2958	56.151	373.310	0.150 [1]
T5	280 - 260	3 1/4	20.03	6.68	98.6	8.2958	68.471	373.310	0.183 [1]
T6	260 - 240	3 1/2	20.03	6.68	91.6	9.6211	81.070	432.951	0.187 [1]
T7	240 - 220	3 1/2	20.03	5.01	68.7	9.6211	92.954	432.951	0.215 [1]
T8	220 - 200	3 3/4	20.03	5.01	64.1	11.0447	106.166	497.010	0.214 [1]
T9	200 - 180	4	20.03	5.01	60.1	12.5664	119.886	565.487	0.212 [1]
T10	180 - 160	4 1/4	20.03	5.01	56.6	14.1863	138.711	638.381	0.217 [1]
T11	160 - 140	4 1/4	20.03	5.01	56.6	14.1863	158.834	638.381	0.249 [1]
T12	140 - 120	4 1/2	20.03	5.01	53.4	15.9043	174.232	715.694	0.243 [1]
T13	120 - 100	4 3/4	20.03	5.01	50.6	17.7205	197.242	797.425	0.247 [1]
T14	100 - 80	4 3/4	20.03	5.01	50.6	17.7205	219.119	797.425	0.275 [1]
T15	80 - 60	5	20.03	5.01	48.1	19.6350	241.469	883.573	0.273 [1]
T16	60 - 40	5 1/4	20.03	5.01	45.8	21.6475	262.576	974.139	0.270 [1]
T17	40 - 20	5 1/4	20.03	5.01	45.8	21.6475	284.578	974.139	0.292 [1]
T18	20 - 0	5 1/2	20.03	5.01	43.7	23.7583	305.775	1069.120	0.286 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L2x1 1/2x3/16	6.40	2.95	83.8	0.3604	2.144	15.675	0.137 [1]
T2	340 - 320	L2x1 1/2x3/16	5.66	2.59	74.0	0.3604	3.112	15.675	0.199 [1]
T3	320 - 300	L2x2x3/16	6.56	3.22	64.9	0.4307	2.490	18.734	0.133 [1]
T4	300 - 280	L2-1/2x2-1/2x3/16	9.67	4.77	75.3	0.5713	2.192	24.851	0.088 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	280 - 260	L2-1/2x2-1/2x3/16	11.74	5.79	91.1	0.5713	2.453	24.851	0.099 [1] ✔
T6	260 - 240	L3x3x3/16	13.44	6.62	86.1	0.7119	2.934	30.968	0.095 [1] ✔
T7	240 - 220	2L2 1/2x2 1/2x3/16x3/8	8.20	7.78	123.7	1.1391	3.782	49.549	0.076 [1] ✔
T8	220 - 200	2L2 1/2x2 1/2x3/16x3/8	9.02	8.56	136.2	1.1039	4.264	48.020	0.089 [1] ✔
T9	200 - 180	2L3x3x3/16x3/8	10.30	9.84	129.1	1.3889	6.434	60.417	0.106 [1] ✔
T10	180 - 160	2L3x3x3/16x3/8	11.18	10.71	140.4	1.3889	7.348	60.417	0.122 [1] ✔
T11	160 - 140	2L3x3x3/16x3/8	11.63	11.17	146.1	1.3889	8.440	60.417	0.140 [1] ✔
T12	140 - 120	2L3x3x1/4x3/8	15.62	15.11	132.8	1.8319	11.350	79.687	0.142 [1] ✔
T13	120 - 100	2L3x3x1/4x3/8	15.62	15.10	132.7	1.8319	12.280	79.687	0.154 [1] ✔
T14	100 - 80	2L3x3x1/4x3/8	16.40	15.89	139.5	1.8319	12.459	79.687	0.156 [1] ✔
T15	80 - 60	2L3 1/2x3 1/2x1/4x3/8	17.21	16.65	128.0	2.1600	13.245	93.960	0.141 [1] ✔
T16	60 - 40	2L3 1/2x3 1/2x1/4x3/8	18.03	17.47	134.1	2.1600	13.585	93.960	0.145 [1] ✔
T17	40 - 20	2L3 1/2x3 1/2x1/4x3/8	18.87	18.31	140.5	2.1600	14.255	93.960	0.152 [1] ✔
T18	20 - 0	2L3 1/2x3 1/2x1/4x3/8	19.73	19.16	146.9	2.1600	14.653	93.960	0.156 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	240 - 220	L2 1/2x2 1/2x3/16	13.50	6.48	101.8	0.5713	2.155	24.851	0.087 [1] ✔
T8	220 - 200	L2 1/2x2 1/2x3/16	15.50	7.47	117.1	0.5713	2.382	24.851	0.096 [1] ✔
T9	200 - 180	L3x3x3/16	17.50	8.46	109.7	0.7119	2.636	30.968	0.085 [1] ✔
T10	180 - 160	L3x3x3/16	19.50	9.45	122.3	0.7119	3.095	30.968	0.100 [1] ✔
T11	160 - 140	L3 1/2x3 1/2x1/4	21.50	10.45	116.4	1.1269	3.579	49.019	0.073 [1] ✔
T12	140 - 120	2L2 1/2x2 1/2x3/16x3/8	23.00	11.18	174.5	1.1039	3.955	48.020	0.082 [1] ✔
T13	120 - 100	2L2 1/2x2 1/2x3/16x3/8	25.00	12.17	189.7	1.1039	4.510	48.020	0.094 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T14	100 - 80	2L2 1/2x2 1/2x3/16x3/8	27.00	13.17	205.2	1.1039	5.024	48.020	0.105 [1]
T15	80 - 60	2L3x3x3/16x3/8	29.00	14.16	182.6	1.3889	5.575	60.417	0.092 [1]
T16	60 - 40	2L3x3x3/16x3/8	31.00	15.15	195.3	1.3889	6.103	60.417	0.101 [1]
T17	40 - 20	2L3 1/2x3 1/2x1/4x3/8	33.00	16.15	179.2	2.2069	6.669	95.999	0.069 [1]
T18	20 - 0	2L3 1/2x3 1/2x1/4x3/8	35.00	17.14	190.1	2.2069	7.229	95.999	0.075 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	350 - 340	L3x3x1/4	4.00	3.59	49.5	0.9394	0.330	40.863	0.008 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	140 - 120	L2x2x3/16	5.75	5.56	108.1	0.7148	3.956	23.161	0.171 [1]
T13	120 - 100	L2x2x3/16	6.25	6.05	117.6	0.7148	4.511	23.161	0.195 [1]
T14	100 - 80	L2x2x3/8	6.75	6.55	132.4	1.3600	5.025	44.064	0.114 [1]
T15	80 - 60	L2-1/2x2-1/2x3/16	7.25	7.04	108.6	0.9023	5.577	29.236	0.191 [1]
T16	60 - 40	L2-1/2x2-1/2x3/16	7.75	7.53	116.1	0.9023	6.104	29.236	0.209 [1]
T17	40 - 20	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower	8.25	8.03	125.4	1.0565	6.670	34.229	0.195 [1]
T18	20 - 0	L3x3x3/16	8.75	8.52	108.9	1.0898	7.229	35.311	0.205 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	140 - 120	L2-1/2x2-1/2x3/16	7.81	7.56	116.5	0.9023	2.687	29.236	0.092 [1] ✔
T13	120 - 100	L2-1/2x2-1/2x3/16	8.20	7.94	122.5	0.9023	2.960	29.236	0.101 [1] ✔
T14	100 - 80	L2-1/2x2-1/2x3/16	8.60	8.35	128.8	0.9023	3.203	29.236	0.110 [1] ✔
T15	80 - 60	L3x3x3/16	9.02	8.76	111.9	1.0898	3.467	35.311	0.098 [1] ✔
T16	60 - 40	L3x3x3/16	9.44	9.17	117.2	1.0898	3.715	35.311	0.105 [1] ✔
T17	40 - 20	L3x3x3/16	9.86	9.60	122.7	1.0898	3.987	35.311	0.113 [1] ✔
T18	20 - 0	L3x3x3/16	10.30	10.03	128.1	1.0898	4.254	35.311	0.120 [1] ✔

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	350 - 340	Leg	2	3	-6.348	49.286	12.9	Pass
		Diagonal	L2x1 1/2x3/16	9	-2.156	10.346	20.8	Pass
							31.4 (b)	
		Top Girt	L3x3x1/4	4	-0.325	28.598	1.1	Pass
							3.2 (b)	
T2	340 - 320	Leg	2	21	-32.518	72.063	45.1	Pass
		Diagonal	L2x1 1/2x3/16	24	-3.305	11.584	28.5	Pass
							45.6 (b)	
T3	320 - 300	Leg	2 1/2	54	-51.296	112.346	45.7	Pass
		Diagonal	L2x2x3/16	75	-2.736	13.174	20.8	Pass
							36.5 (b)	
T4	300 - 280	Leg	3 1/4	81	-65.920	183.313	36.0	Pass
		Diagonal	L2-1/2x2-1/2x3/16	84	-2.299	13.474	17.1	Pass
							28.0 (b)	
T5	280 - 260	Leg	3 1/4	102	-81.260	183.313	44.3	Pass
		Diagonal	L2-1/2x2-1/2x3/16	108	-2.488	10.341	24.1	Pass
							31.3 (b)	
T6	260 - 240	Leg	3 1/2	123	-97.475	234.484	41.6	Pass
		Diagonal	L3x3x3/16	128	-2.939	13.820	21.3	Pass
							37.5 (b)	
T7	240 - 220	Leg	3 1/2	144	-113.322	306.641	37.0	Pass
		Diagonal	2L2 1/2x2 1/2x3/16x3/8	152	-3.842	25.202	15.2	Pass
							24.2 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	148	-2.155	8.246	26.1	Pass
							27.5 (b)	
		Inner Bracing	L2 1/2x2 1/2x3/16	156	-0.011	7.609	0.6	Pass
T8	220 - 200	Leg	3 3/4	183	-131.360	368.015	35.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	2L2 1/2x2 1/2x3/16x3/8	191	-4.341	21.196	20.5 23.8 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	187	-2.382	6.207	38.4	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	194	-0.012	5.772	0.7	Pass
T9	200 - 180	Leg	4	222	-151.814	434.236	35.0	Pass
		Diagonal	2L3x3x3/16x3/8	230	-6.668	30.555	21.8 34.0 (b)	Pass
		Horizontal	L3x3x3/16	226	-2.636	8.488	31.1 33.7 (b)	Pass
		Inner Bracing	L3x3x3/16	232	-0.015	7.941	0.7	Pass
T10	180 - 160	Leg	4 1/4	261	-178.441	505.220	35.3	Pass
		Diagonal	2L3x3x3/16x3/8	270	-7.596	26.278	28.9 38.8 (b)	Pass
		Horizontal	L3x3x3/16	265	-3.095	6.804	45.5	Pass
		Inner Bracing	L3x3x3/16	271	-0.016	6.396	0.8	Pass
T11	160 - 140	Leg	4 1/4	300	-206.384	505.220	40.9	Pass
		Diagonal	2L3x3x3/16x3/8	308	-8.456	22.339	37.9 44.6 (b)	Pass
		Horizontal	L3 1/2x3 1/2x1/4	304	-3.579	11.687	30.6 34.3 (b)	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	310	-0.019	11.050	0.7	Pass
T12	140 - 120	Leg	4 1/2	339	-228.062	580.902	39.3	Pass
		Diagonal	2L3x3x1/4x3/8	358	-12.664	31.416	40.3 45.0 (b)	Pass
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	347	-3.955	13.682	28.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	352	-3.956	5.620	70.4	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	375	-2.687	6.069	44.3	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	361	-0.028	9.656	0.7	Pass
T13	120 - 100	Leg	4 3/4	384	-260.060	661.231	39.3	Pass
		Diagonal	2L3x3x1/4x3/8	400	-12.490	28.916	43.2 48.7 (b)	Pass
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	392	-4.510	11.547	39.1	Pass
		Redund Horz 1 Bracing	L2x2x3/16	401	-4.511	4.748	95.0	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	420	-2.960	5.494	53.9	Pass
		Inner Bracing	L4x4x1/4	408	-0.030	12.311	0.8	Pass
T14	100 - 80	Leg	4 3/4	429	-289.717	661.231	43.8	Pass
		Diagonal	2L3x3x1/4x3/8	448	-13.761	26.593	51.7	Pass
		Horizontal	2L2 1/2x2 1/2x3/16x3/8	437	-5.024	9.860	51.0	Pass
		Redund Horz 1 Bracing	L2x2x3/8	464	-5.025	7.521	66.8	Pass
		Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	465	-3.203	4.968	64.5	Pass
		Inner Bracing	L4x4x1/4	451	-0.031	10.555	0.8	Pass
T15	80 - 60	Leg	5	474	-321.487	746.168	43.1	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	493	-13.718	38.008	36.1 44.8 (b)	Pass
		Horizontal	2L3x3x3/16x3/8	482	-5.575	15.048	37.1	Pass
		Redund Horz 1 Bracing	L2-1/2x2-1/2x3/16	487	-5.577	6.992	79.8	Pass
		Redund Diag 1 Bracing	L3x3x3/16	513	-3.467	7.925	43.8	Pass
		Inner Bracing	2L3x3x3/16x3/8	496	-0.037	14.343	0.8	Pass
T16	60 - 40	Leg	5 1/4	519	-351.893	835.679	42.1	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	538	-15.101	35.047	43.1 45.9 (b)	Pass
		Horizontal	2L3x3x3/16x3/8	527	-6.103	13.146	46.4	Pass
		Redund Horz 1	L2-1/2x2-1/2x3/16	554	-6.104	6.113	99.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Bracing						
		Redund Diag 1 Bracing	L3x3x3/16	558	-3.715	7.227	51.4	Pass
		Inner Bracing	2L3x3x3/16x3/8	542	-0.038	12.552	0.9	Pass
T17	40 - 20	Leg	5 1/4	562	-384.529	835.679	46.0	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	583	-14.997	32.326	46.4 48.2 (b)	Pass
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	565	-6.669	24.167	27.6	Pass
		Redund Horz 1 Bracing	L2.5x2.5x3/16 + L2.5x2.5x1/4 (C-Shape) - Cleary Tower	584	-6.670	14.963	44.6	Pass
		Redund Diag 1 Bracing	L3x3x3/16	591	-3.987	6.591	60.5	Pass
		Inner Bracing	2L3 1/2x3 1/2x1/4x3/8	586	-0.043	23.141	0.7	Pass
T18	20 - 0	Leg	5 1/2	607	-416.844	929.740	44.8	Pass
		Diagonal	2L3 1/2x3 1/2x1/4x3/8	628	-15.968	29.896	53.4	Pass
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	610	-7.229	21.456	33.7	Pass
		Redund Horz 1 Bracing	L3x3x3/16	612	-7.229	8.374	86.3	Pass
		Redund Diag 1 Bracing	L3x3x3/16	651	-4.254	6.043	70.4	Pass
		Inner Bracing	2L3 1/2x3 1/2x1/4x3/8	633	-0.042	20.572	0.7	Pass
						Summary		
						Leg (T17)	46.0	Pass
						Diagonal (T18)	53.4	Pass
						Horizontal (T14)	51.0	Pass
						Top Girt (T1)	3.2	Pass
						Redund Horz 1 Bracing (T16)	99.9	Pass
						Redund Diag 1 Bracing (T18)	70.4	Pass
						Inner Bracing (T16)	0.9	Pass
						Bolt Checks	49.5	Pass
						RATING =	**99.9**	**Pass**

MATHCAD CALCULATION PRINTOUT

EXISTING 350' SELF SUPPORT TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load; $Pv := 432 \cdot kips$ Shear; $V_u := 49 \cdot kips$

Uplift load; $P_{up} := 316 \cdot kips$ Moment; $M := 0 \cdot kips \cdot ft$

Anchor Rod Data is as per Structural Analysis by Paul J. Ford & Co., Job No. A03-T143 dated 12/22/2003.

Number of Anchor Rods: $N_{anchors} := 6$

Diameter of Anchors: $D_{anchors} := 2.5in$ $n := 4in^{-1}$

Area of anchor bolts $A_b := \frac{\pi \cdot \left(D_{anchors}^{2}\right)}{4} = 4.909 \cdot in^2$

Net Tensile Area of Anchors: $A_{net} := \frac{\pi}{4} \cdot \left(D_{anchors} - \frac{0.9743}{n}\right)^2 = 3.999 \cdot in^2$

Minimum Yield Stress $F_{Yanchors} := 36ksi$ (Grade A36)

Ultimate Tensile Stress: $F_{Uanchors} := 58ksi$

Saftey Factor for Anchor: $\phi_t := 0.8$ (Section 4.9.9, TIA-222-G Addendum 2)

Allowable Axial Load per Anchor: $T_{cap} := \phi_t \cdot F_{Uanchors} \cdot A_{net}$

$T_{cap} = 185.545 \cdot kips$

Interaction Equation for Anchor Rods as per Section 4.9.9, TIA-222-G Addendum 1 and Figure 4.4

For detail type (D) as per Figure 4.4 $\eta := 0.50$

$P_u := if\left(\eta > 0.5, P_{up}, Pv\right) = 432 \cdot kips$

Maximum Load on Anchor: $T_{max} := \frac{P_u + \frac{V_u}{\eta}}{N_{anchors}}$

$T_{max} = 88.333 \cdot kips$

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 47.607 \cdot \%$ OK!

$Anchor\_Rod\_Check := if\left(T_{max} < T_{cap}, "OK", "Not OK"\right)$

Anchor_Rod_Check = "OK"

For detail type (d), when the clear distance from top of concrete to the bottom of leveling nut exceeds 1.0 times the diameter of the anchor rod, the interaction equation as per section 4.9.9.,TIA-222-G Addendum 1 shall also be satisfied.

Clear distance: $I_{ar} := 2.0in$ (estimated from photo)

Clear distance: $I_{ar} = 2 \cdot in$ < Diameter of Anchors: $D_{anchors} = 2.5 \cdot in$ OK!

Summary

-Foundation Reactions from Tower Base-

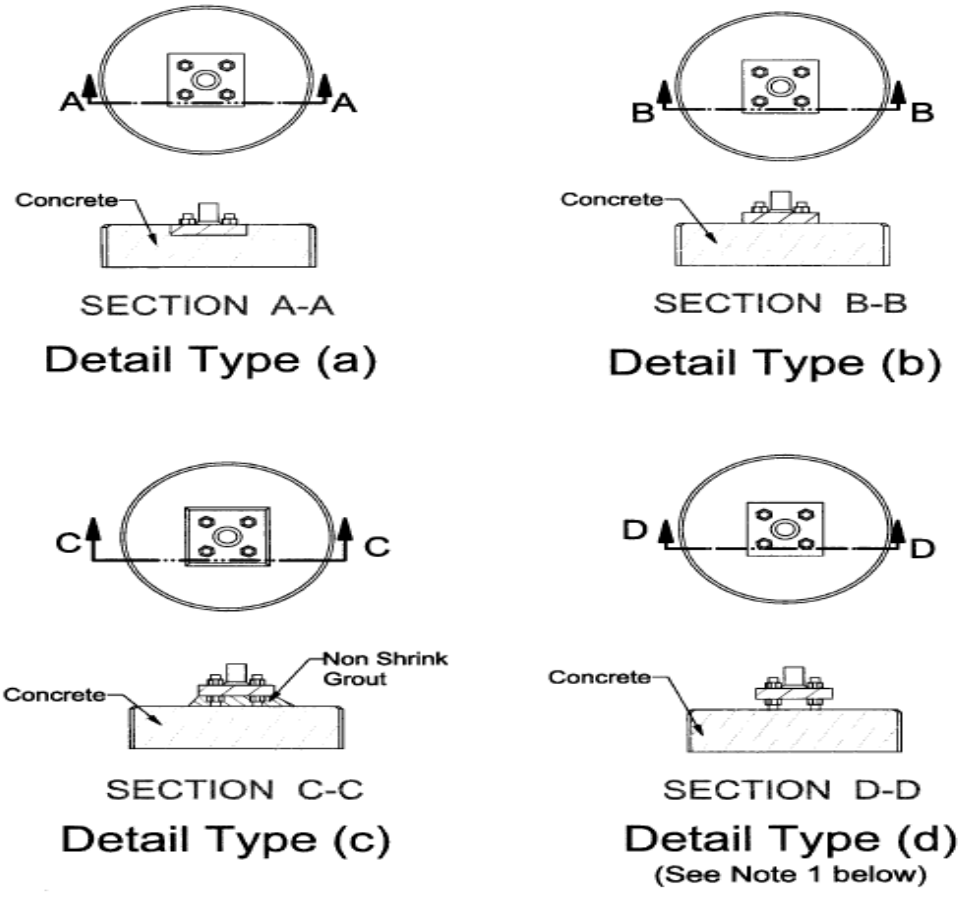
Shear	$V_u = 49 \cdot kips$
Down load	$Pv = 432 \cdot kips$
Uplift load	$P_{up} = 316 \cdot kips$
Moment	$M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 88.333 \cdot kips$ < $T_{cap} = 185.545 \cdot kips$

Anchor_Rod_Check := if$\left(T_{max} < T_{cap}, \text{"OK"}, \text{"Not OK"}\right)$

Anchor_Rod_Check = "OK"

ANSI/TIA-222-G



Note:

1. When clear distance from top of concrete to the bottom face of the leveling nut exceeds 1.5 times the diameter of the anchor rod, bending of the anchor rod shall be considered (refer to 4.9.9).

Figure 4-4: Anchor Rod Detail Types

4.9.9 Anchor Rods

For anchor rods, the following interaction equation shall be satisfied:

$$\left(\frac{P_u + \frac{V_u}{\eta}}{\phi R_{nt}} \right) \leq 1$$

where:

$\phi = 0.80$

P_u = tension force for detail types (a), (b) & (c) and larger of compression or tension force for type (d) as depicted in Figure 4-4.

V_u = shear force (direct shear and torsion components) corresponding to P_u

R_{nt} = nominal tensile strength of anchor rod as per 4.9.6.1

η = 0.90 for detail type (a)
= 0.70 for detail type (b)
= 0.55 for detail type (c)
= 0.50 for detail type (d)

For detail type (d), when the clear distance from the top of concrete to the bottom leveling nut exceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied:

$$\left(\frac{V_u}{\phi R_{nv}} \right)^2 + \left(\left| \frac{P_u}{\phi R_{nt}} \right| + \left| \frac{M_u}{\phi R_{nm}} \right| \right)^2 \leq 1$$

where:

M_u = bending moment corresponding to V_u
= $0.65\, l_{ar} V_u$

l_{ar} = length from top of concrete to bottom of anchor rod leveling nut

Addendum 1

ϕR_{nv} = design shear strength of anchor rod as per 4.9.6.3

ϕR_{nm} = design flexural strength of anchor rod in accordance with 4.7.1 using the tensile root diameter for the determination of z

d_{rt} = tensile root diameter of rod, in [mm]
= d – 0.9743/n inches
= d – 0.9382(p) mm

d = nominal rod diameter, in [mm]

n = number of threads per inch

p = pitch of threads, mm

4.9.6.3 Design Shear Strength

The design shear strength of a bolt, ϕR_{nv}, shall be taken as:

$\phi = 0.75$

(a) When threads are excluded from the shear plane:
$R_{nv} = 0.55\ F_{ub}\ A_b$

(b) When threads are included in the shear plane:
$R_{nv} = 0.45\ F_{ub}\ A_b$

where:

F_{ub} = Specified minimum tensile strength of bolt

A_b = nominal unthreaded area of bolt

4.7.1 Solid Round Members

For solid round members, M_n shall be determined as follows:

$M_n = F_y'Z$

where:

F_y' = effective yield stress as determined from 4.5.4.1

Z = plastic section modulus

4.5.4.1 Effective Yield Stress

For 60^O and 90^O angle members, the effective yield stress for axial compression, F'_y, shall be determined as follows:

$w/t \le 0.47\sqrt{\frac{E}{F_y}}$	$F'_y = F_y$
$0.47\sqrt{\frac{E}{F_y}} < w/t \le 0.85\sqrt{\frac{E}{F_y}}$	$F'_y = \left[1.677-0.677\left(\frac{w/t}{0.47\sqrt{E/F_y}}\right)\right] F_y$
$0.85\sqrt{\frac{E}{F_y}} < w/t \le 25$	$F'_y = [0.0332\ \pi^2\ E/(w/t)^2]$

The width to thickness ratio (w/t) shall not exceed 25 for angle members (refer to Figure 4-3).

For solid round members, the effective yield stress, F'_y, shall be equal to F_y.

For tubular round members, the diameter to thickness ratio (D/t) shall not exceed 400. The effective yield stress, F'_y, shall be determined as follows:

$D/t \le 0.114\ E/F_y$	$F'_y = F_y$
$0.114\ E/F_y < D/t \le 0.448\ E/F_y$	$F'_y = \left(\frac{0.0379E}{(D/t)F_y}+\frac{2}{3}\right)F_y$
$0.448\ E/F_y < D/t \le 400$	$F'_y = \frac{0.337E}{(D/t)}$

PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
   A. PLAN ENTITLED "WOLCOTT-WOLCOTT RD" PREPARED BY FULLERTON ENGINEERING DESIGN OF, IL LAST REVISED 06/23/2017.
   B. LIMITED FIELD OBSERVATION BY MASER CONSULTING ON 05/21/2018.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. THE PROPOSED FACILITY WILL CAUSE NO INCREASE IN STORM WATER RUNOFF, THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION.
15. THE TOWER, MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EIA/TIA-222-G AS PER IBC REQUIREMENTS.
16. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
17. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
18. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS.

#10041812_CTL01111_Rev A.dwg(T-1) By: ACOA

at&t

SITE NAME: WALCOTT-NORTH
FA NUMBER: 10041812
SITE NUMBER: CTL01111
3C - MRCTB018352
4C - MRCTB032155
5C - MRCTB032159
1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

VICINITY MAP

CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 IBC
2. 2014 NATIONAL ELECTRICAL CODE - NFPA 70
3. 2012 NFPA 101
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
5. AMERICAN CONCRETE INSTITUTE
6. TIA-222-G
7. TIA 607 FOR GROUNDING
8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2 LATEST EDITION
9. TELCORDIA GR-1275
10. ANSI T1.311
11. PROPOSED USE: UNMANNED TELECOM FACILITY
12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
13. CONSTRUCTION TYPE: IIB
14. USE GROUP: U

PROJECT INFORMATION

SITE INFORMATION

LATITUDE:	41.6215731° N
LONGITUDE:	72.9736319° W
JURISDICTION:	NEW HAVEN COUNTY

APPLICANT/LESSEE

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

TOWER OWNER

COMPANY:	SBA COMMUNICATIONS CORP.
ADDRESS:	8051 CONGRESS AVENUE
CITY, STATE, ZIP:	BOCA RATON, FL 33487

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	TODD OLIVER
E-MAIL:	TODD.OLIVER@SMARTLINKLLC.COM

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE
E-MAIL:	SHARON.KEEFE@SMARTLINKLLC.COM

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY ROAD, BUILDING 3, STE. 102
CITY, STATE, ZIP:	NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY
E-MAIL:	MARK.DONNELLY@SMARTLINKLLC.COM

ENGINEER

COMPANY:	MASER CONSULTING P.A.
ADDRESS:	2000 MIDLANTIC DRIVE, SUITE 100
CITY, STATE, ZIP:	MT. LAUREL, NJ 08054
CONTACT:	ROBERT ANDREWS
PHONE:	(856) 797-0412
E-MAIL:	RANDREWS@MASERCONSULTING.COM

PROJECT DESCRIPTION/ SCOPE OF WORK

- INSTALL (9) NEW RRUS, (3) PER SECTOR
- RELOCATE (3) EXISTING RRU'S, (1) PER SECTOR
- INSTALL (3) NEW PANEL ANTENNAS, (1) PER SECTOR
- REMOVE (3) EXISTING PANEL ANTENNAS, (1) PER SECTOR
- RELOCATE (3) EXISTING PANEL ANTENNAS, (1) PER SECTOR
- INSTALL (2) NEW DC-6 SURGE SUPPRESSION DOMES
- INSTALL (2) NEW 18-PAIR FIBER CABLE
- INSTALL (4) NEW 6/C DC CABLES
- SWAP DUS WITH (1) 5216
- INSTALL 2ND XMU AND (1) 6630
- MODIFY EXISTING MOUNTS

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 10041812, VERSION 1.0, LAST UPDATED 05/09/2018.

SHEET INDEX

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2	10/22/18	REVISED PER COMMENTS	AJC	RA
1	10/10/18	REVISED PER COMMENTS	AJC	RA
0	07/09/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS TSOUKALAS
PETROS C. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577
32577
PROFESSIONAL ENGINEER

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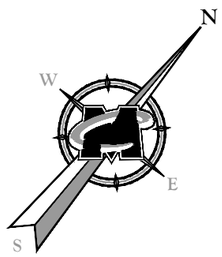
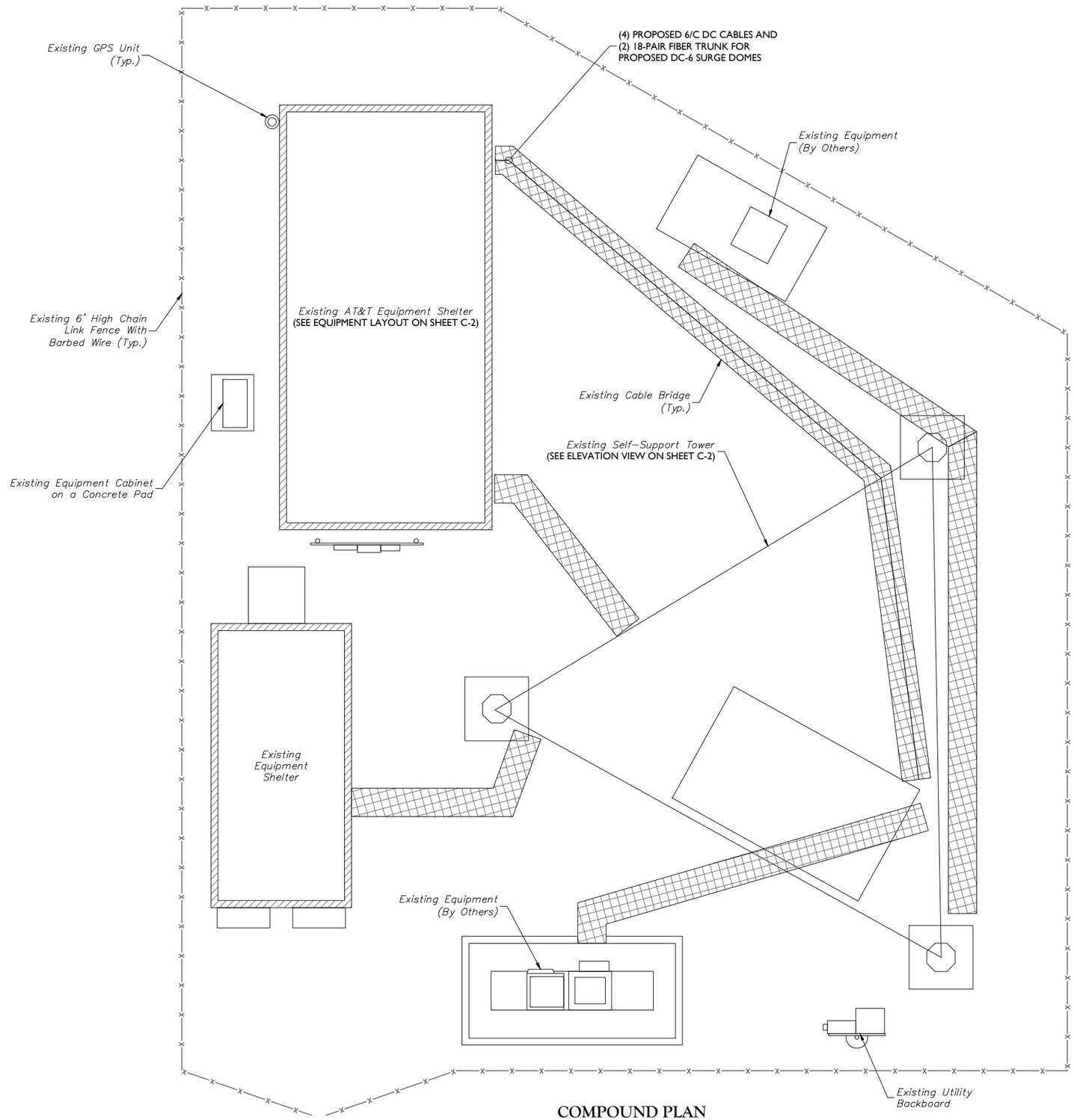
SITE NAME:
WOLCOTT-NORTH
FA# 10041812
SITE# CTL01111
1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
TITLE SHEET

SHEET NUMBER :
T-1





COMPOUND PLAN

4 3.2 2.4 1.6 0.8 0 1 4 8

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

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STATE OF CONNECTICUT
PETROS T. SOUKALAS
32577
REGISTERED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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SITE# CTL01111

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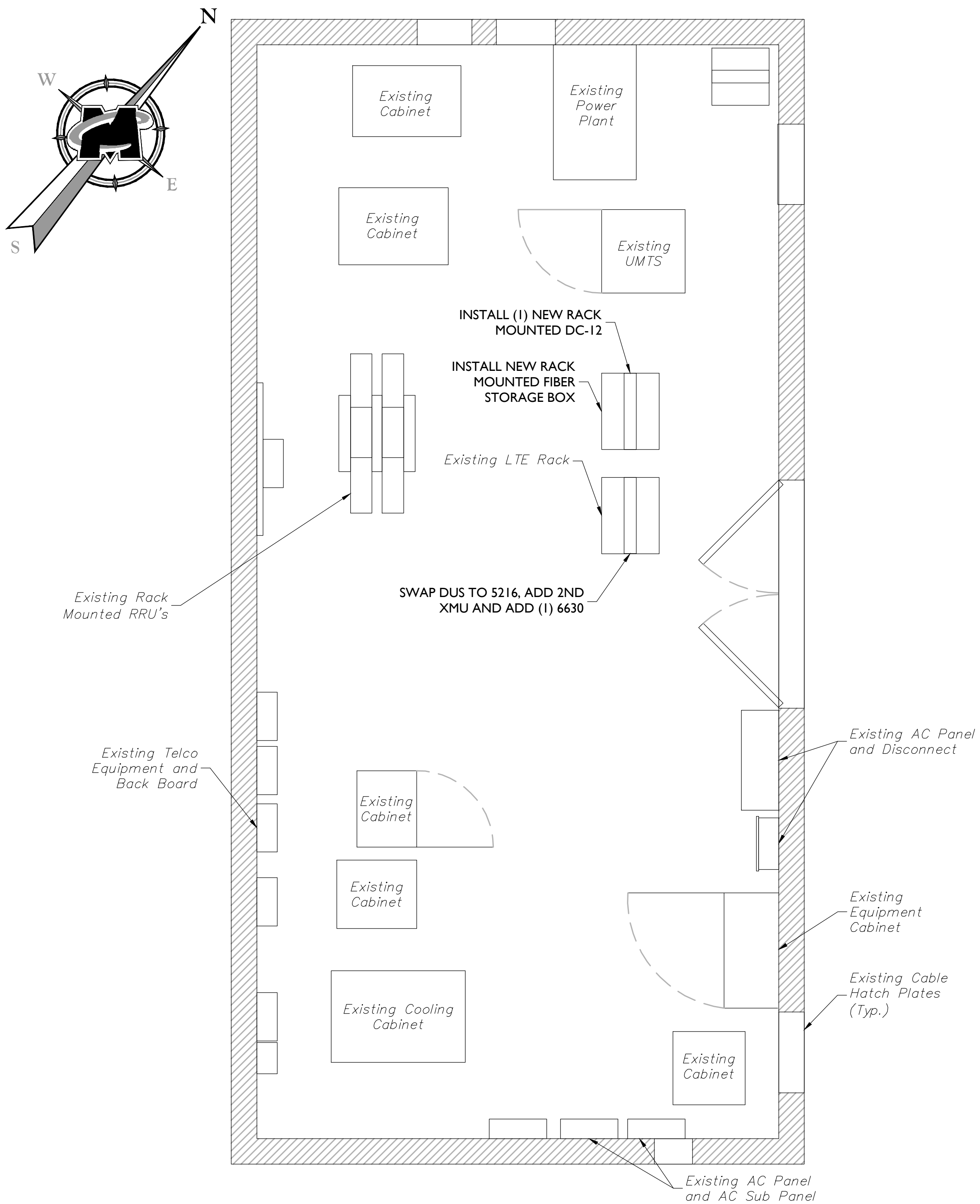
NEW HAVEN COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
COMPOUND PLAN

SHEET NUMBER :
C-1

#18946025 | CTL01111 | Rev A.dwg | C-1 | By: AJCOA



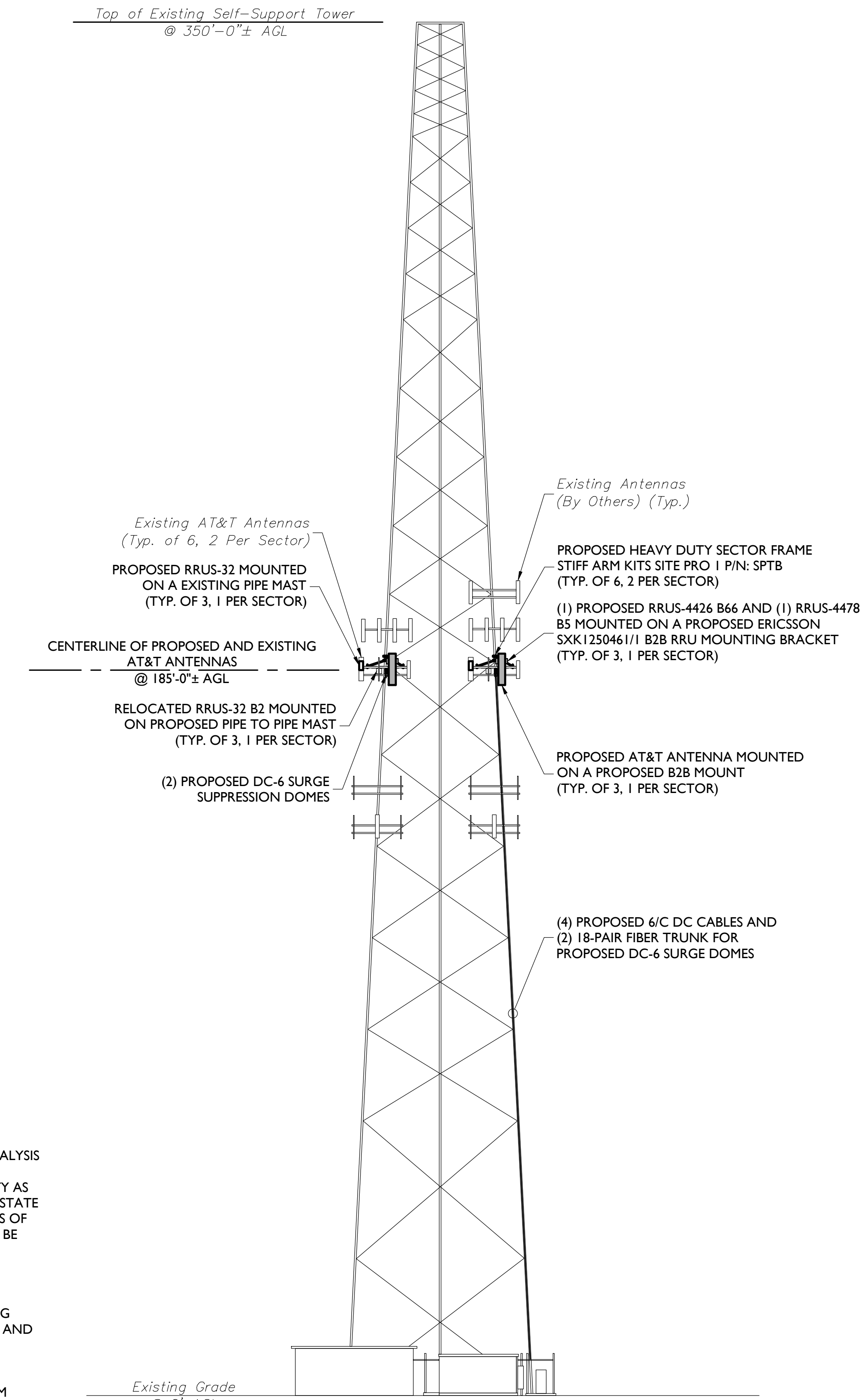
EQUIPMENT LAYOUT

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

STRUCTURAL NOTES:

1. MASER CONSULTING P.A. HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY AS REQUIRED UNDER THE MOST CURRENT LOCAL, STATE AND FEDERAL CODES. A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION MUST BE PREPARED BY AN APPROPRIATE LICENSED STRUCTURAL ENGINEER CERTIFYING THAT THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS, CABLES AND APPURTENANCES COMPLIES WITH THE MOST CURRENT LOCAL, STATE AND FEDERAL CODES.

2. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.



ELEVATION VIEW

SCALE : 1" = 10' FOR 22"X34"
(SCALE : 1" = 20' FOR 11"X17")

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AS SHOWN	18946025A

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1	10/10/18	REVISED PER COMMENTS	AJC	RA
0	07/09/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
32577
LICENSED PROFESSIONAL ENGINEER

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

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2000 Midlantic Drive
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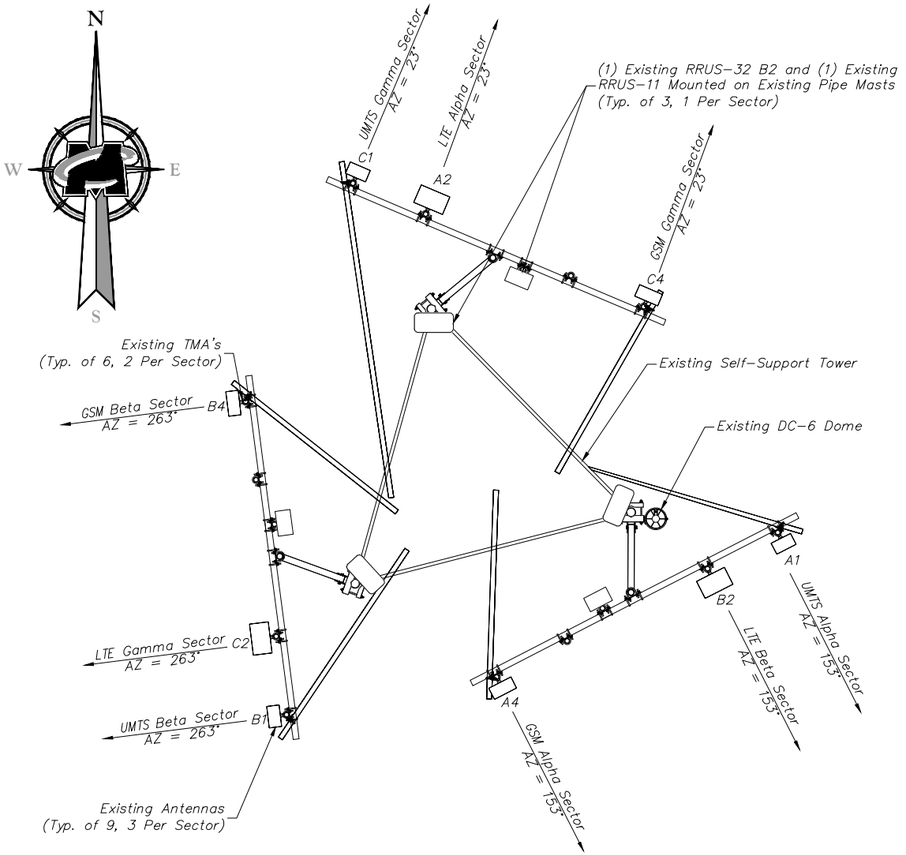
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

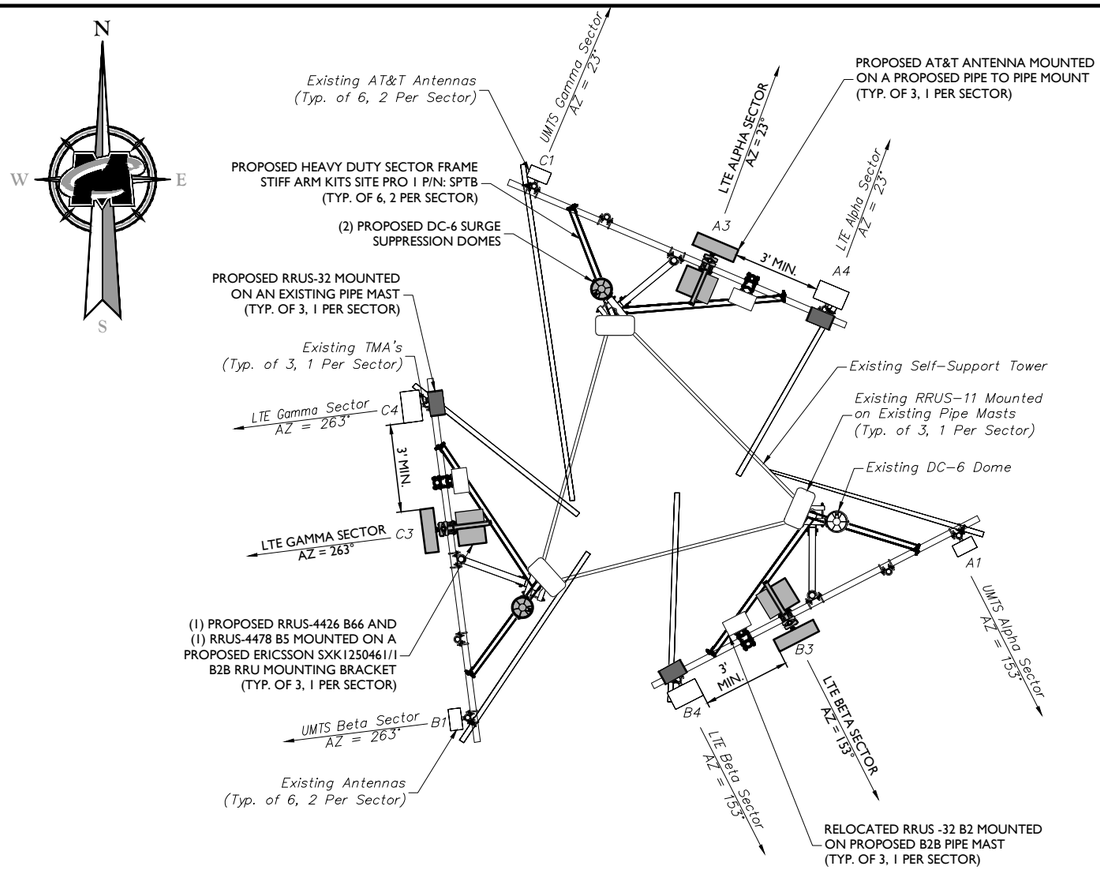
SHEET TITLE :
EQUIPMENT LAYOUT AND ELEVATION VIEW

SHEET NUMBER :
C-2



EXISTING ANTENNA LAYOUT

NOT TO SCALE



PROPOSED ANTENNA LAYOUT

NOT TO SCALE

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE
8 INCH MINIMUM SEPARATION BETWEEN BACK OF PANEL ANTENNA AND EXISTING/PROPOSED EQUIPMENT

ANTENNA SCHEDULE

SECTOR		EXISTING ANTENNA	PROPOSED ANTENNA	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH (DEG.)	ANT. CL. ELEV. (ft.)	REMOTE RADIO/TMA CONFIGURATION	TRANSMISSION CABLE		
													QUANTITY	TYPE	STATUS
Sector 1	1	KMW AM-X-CD-16-65-00T-RET	KMW AM-X-CD-16-65-00T-RET	UMTS	REMAIN	72.00	11.80	5.90	48.50	153	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA	4	1 5/8" COAX	REMAIN
	2	CCI HPA-65R-BUUH6													
	3		**KMW EPBQ-654L8H8-L2**	**LTE**	**PROPOSED**	**96.00**	**21.00**	**6.30**	**86.00**	**23**	**185**	**(1) RRUS-4478 B5 (1) RRUS-4426 B66** (1) RRUS-32 B2	1/2 **2/4**	FIBER/DC **FIBER/DC**	REMAIN **PROPOSED**
	4	KMW AM-X-CD-16-65-00T-RET	**CCI HPA-65R-BUU-H6**	**LTE**	**RELOCATED**	72.00	14.8	9	51.00	23	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA (1) RRUS-11 **(1) RRUS-32**			
Sector 2	5	KATHREIN 80010121	KATHREIN 80010121	UMTS	REMAIN	54.50	10.30	5.90	44.10	263	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA	4	1 5/8" COAX	REMAIN
	6	CCI HPA-65R-BUUH6													
	7		**KMW EPBQ-654L8H8-L2**	**LTE**	**PROPOSED**	**96.00**	**21.00**	**6.30**	**86.00**	**153**	**185**	**(1) RRUS-4478 B5 (1) RRUS-4426 B66** (1) RRUS-32 B2	1/2	FIBER/DC	EXISTING
	8	KMW AM-X-CD-16-65-00T-RET	**CCI HPA-65R-BUU-H6**	**LTE**	**RELOCATED**	72.00	14.80	9	51.00	153	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA (1) RRUS-11 **(1) RRUS-32**			
Sector 3	9	KATHREIN 80010121	KATHREIN 80010121	UMTS	REMAIN	54.50	10.30	5.90	44.10	23	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA	4	1 5/8" COAX	REMAIN
	10	CCI HPA-65R-BUUH6													
	11		**KMW EPBQ-654L8H8-L2**	**LTE**	**PROPOSED**	**96.00**	**21.00**	**6.30**	**86.00**	**263**	**185**	**(1) RRUS-4478 B5 (1) RRUS-4426 B66** (1) RRUS-32 B2	1/2	FIBER/DC	EXISTING
	12	KMW AM-X-CD-16-65-00T-RET	**CCI HPA-65R-BUU-H6**	**LTE**	**RELOCATED**	72.00	14.80	9	51.00	263	185	(2) LGP 21901 Diplexer (1) DTMABP7819VG12A TMA (1) RRUS-11 **(1) RRUS-32**			

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1	10/10/18	REVISED PER COMMENTS	AJC	RA
0	07/09/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT — PETROS S. TSOUKALAS — 32577 — REGISTERED PROFESSIONAL ENGINEER

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

SITE NAME:

WOLCOTT-NORTH
FA# 10041812
SITE# CTL01111

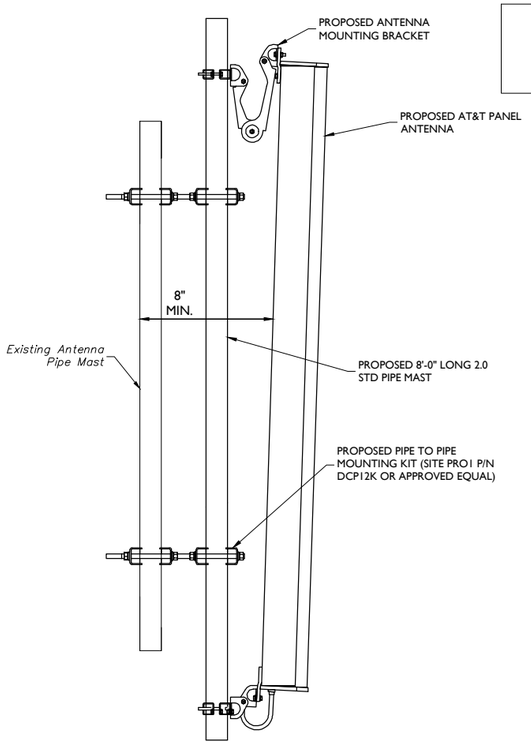
1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

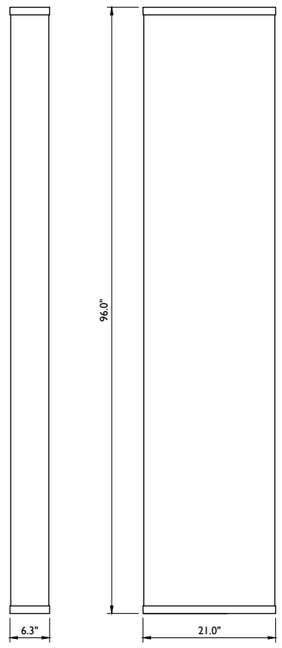
SHEET TITLE :
ANTENNA LAYOUTS AND ANTENNA SCHEDULE

SHEET NUMBER :
C-3

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE
8 INCH MINIMUM SEPARATION BETWEEN BACK OF PANEL ANTENNA AND EXISTING/PROPOSED EQUIPMENT

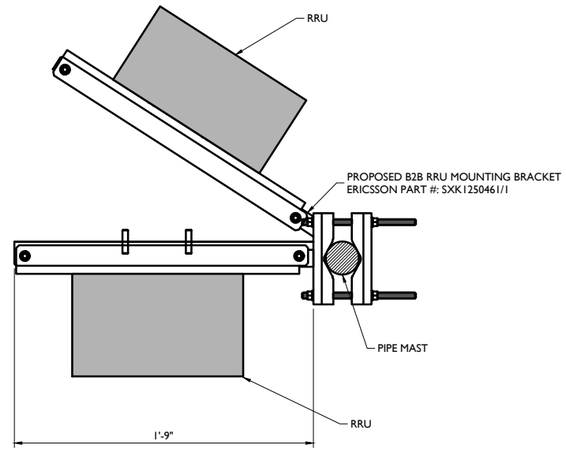


ANTENNA MOUNTING DETAIL
NOT TO SCALE

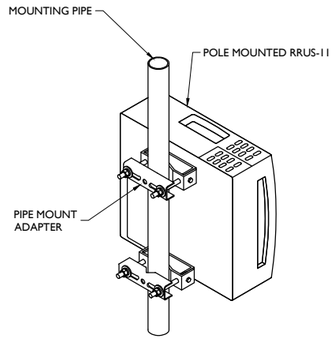


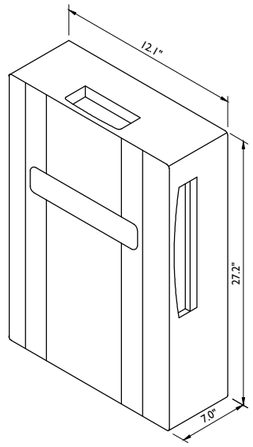
WEIGHT = 86 LBS
EPBQ-654L8H8-L2

ANTENNA DETAIL
NOT TO SCALE



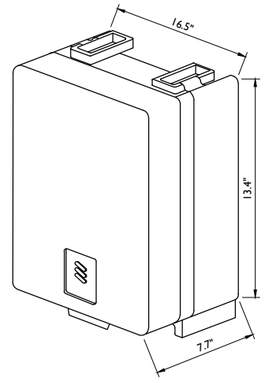
RRU MOUNTING DETAIL
NOT TO SCALE





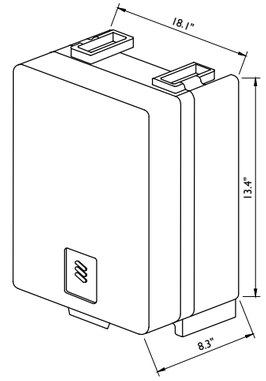
RRUS-32 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0" (INCLUDES SUNSHIELD)
WEIGHT: 53 LBS

RRUS-32 DETAIL
NOT TO SCALE



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

RRU-4478-B5 DETAIL
NOT TO SCALE



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

RRUS-B14 4478 DETAIL
NOT TO SCALE

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1	10/10/18	REVISED PER COMMENTS	AJC	RA
0	07/09/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT · PETROS T. TSOUKALAS · 32577 · LICENSED PROFESSIONAL ENGINEER

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

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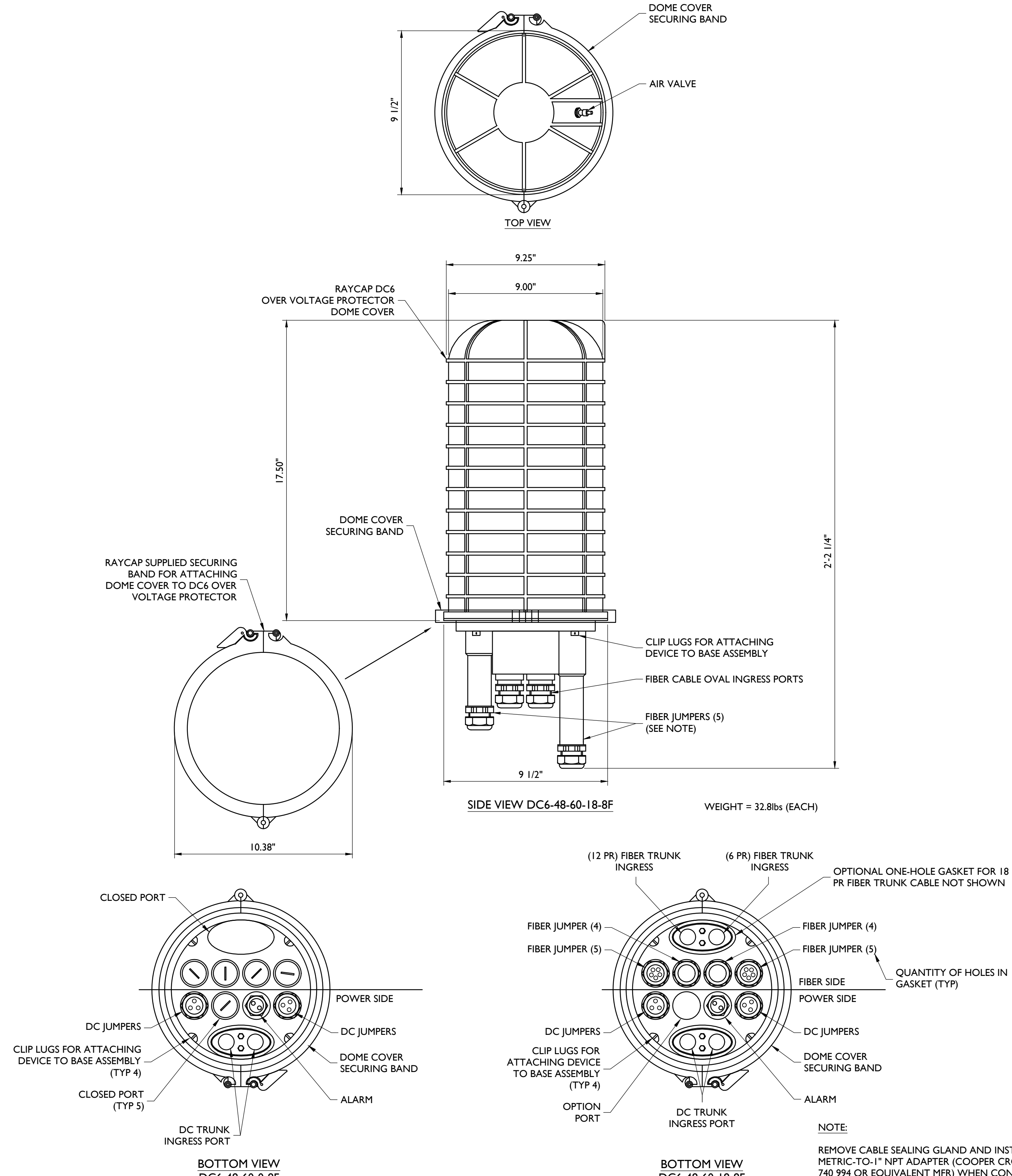
FA# 10041812
SITE# CTL01111

1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE : CONSTRUCTION DETAILS

SHEET NUMBER : A-1

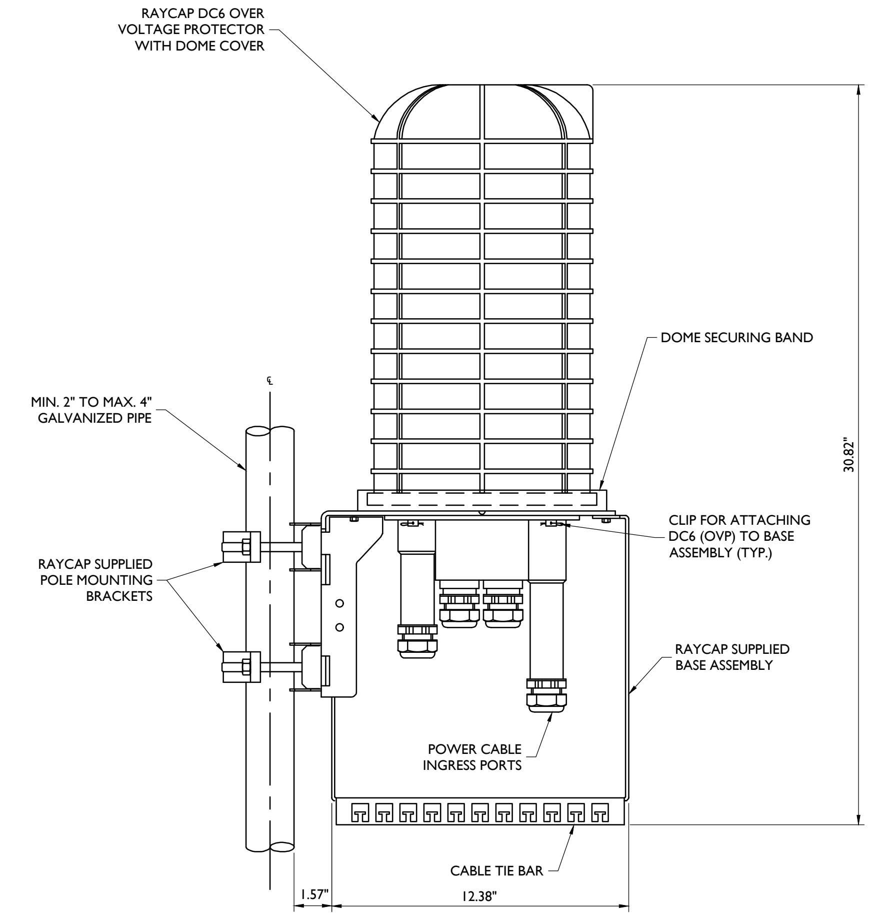


NOTE:

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

DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE



ELEVATION

NOTES:

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

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

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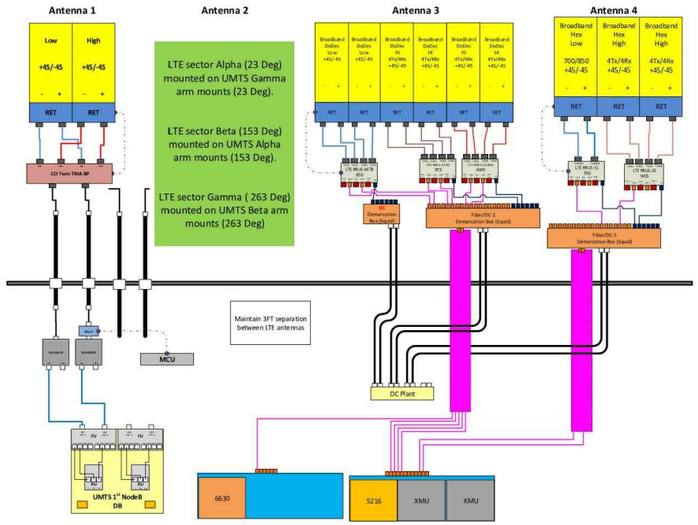
SHEET TITLE : CONSTRUCTION DETAILS

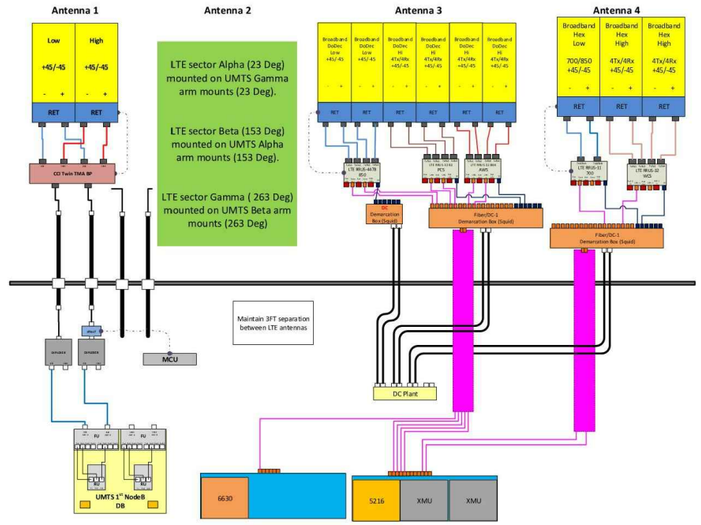
SHEET NUMBER : A-2

Diagram - Sector A Diagram File Name - CT1111_A_B_C_LTESC_Rev1.vsd
Atoll Site Name - CTV1111 Location Name - WOLCOTT-NORTH Market - CONNECTICUT Market Cluster - NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson



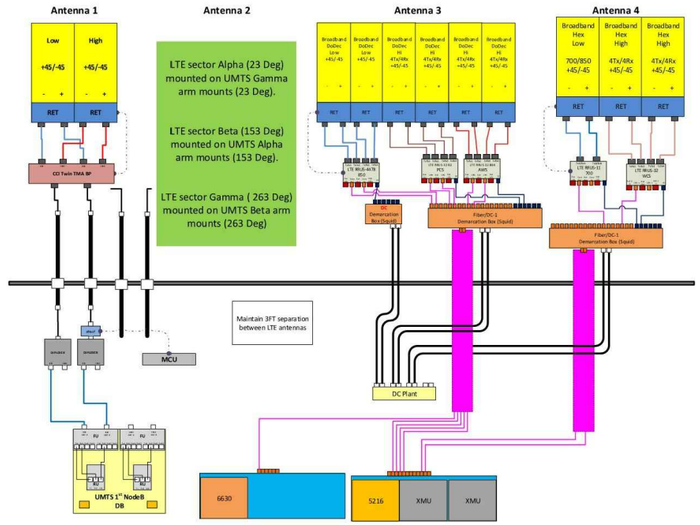
ALPHA SECTOR

Diagram - Sector B Diagram File Name - CT1111_A_B_C_LTESC_Rev1.vsd
Atoll Site Name - CTV1111 Location Name - WOLCOTT-NORTH Market - CONNECTICUT Market Cluster - NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson



BETA SECTOR

Diagram - Sector C Diagram File Name - CT1111_A_B_C_LTESC_Rev1.vsd
Atoll Site Name - CTV1111 Location Name - WOLCOTT-NORTH Market - CONNECTICUT Market Cluster - NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson



GAMMA SECTOR

BASED ON: RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND_CONNECTICUT_CTV1111_2018-LTE-Next-Carrier_LTE_om636a_2051A066KI_10041812_26036_03-14-2018_Final-Approved_v1.00", LAST REVISED 05/09/2018.

RF PLUMBING DIAGRAMS

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STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
REGISTERED PROFESSIONAL ENGINEER
PETROS TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

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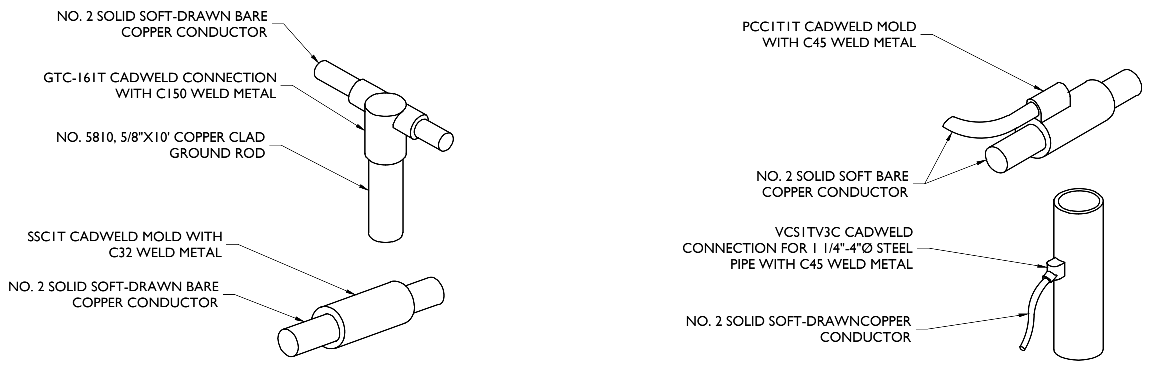
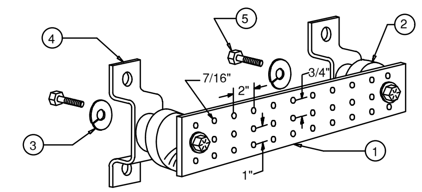
SHEET TITLE : PLUMBING DIAGRAM

SHEET NUMBER : A-3



CADWELD DETAILS
NOT TO SCALE



LEGEND

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

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

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

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

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

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

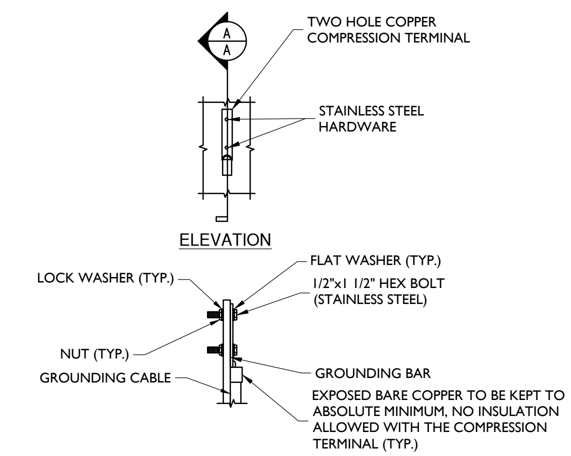
SECTION "P" - SURGE PRODUCERS

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

SECTION "A" - SURGE ABSORBERS

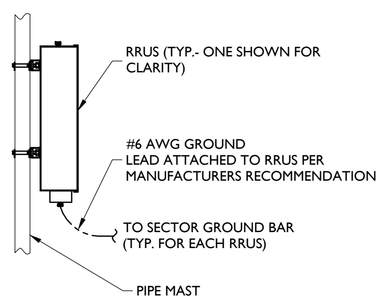
INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

MASTER GROUND BAR
NOT TO SCALE

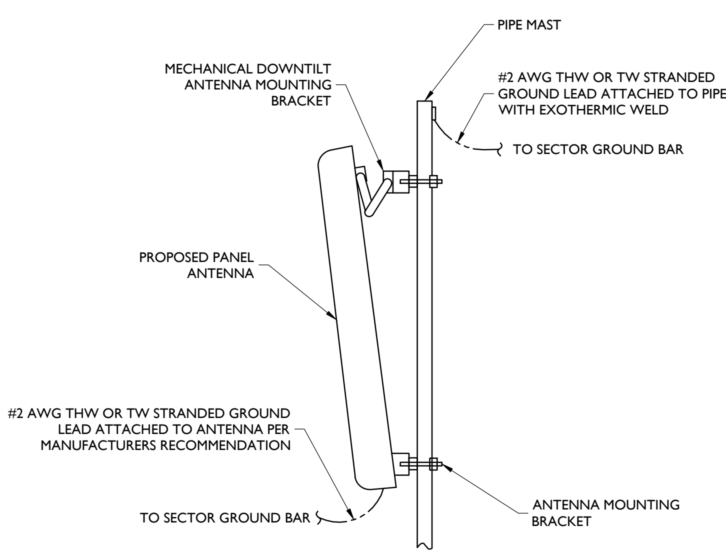


SECTION A-A

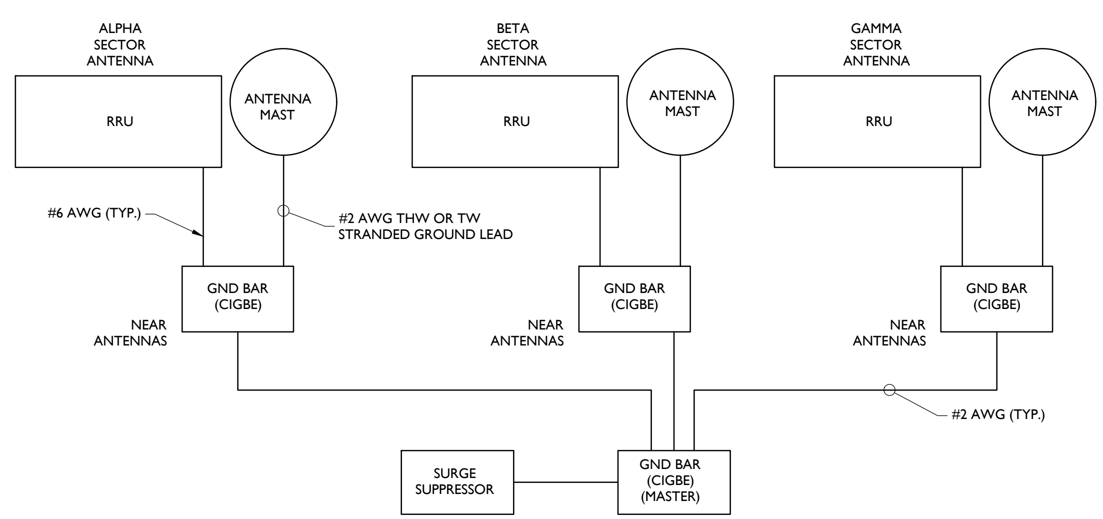
TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



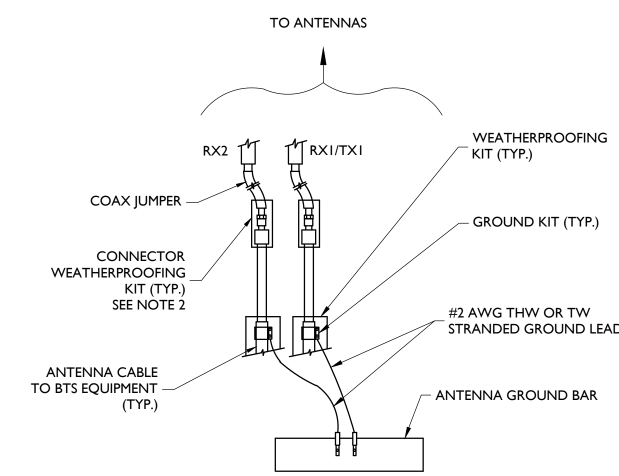
RRU GROUNDING
NOT TO SCALE



ANTENNA GROUNDING



SCHEMATIC DIAGRAM GROUNDING SYSTEM



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.

2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR
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PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: 32577

STATE OF CONNECTICUT PETROS TSOUKALAS 32577 LICENSED PROFESSIONAL ENGINEER

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FA# 10041812
SITE# CTL01111

1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

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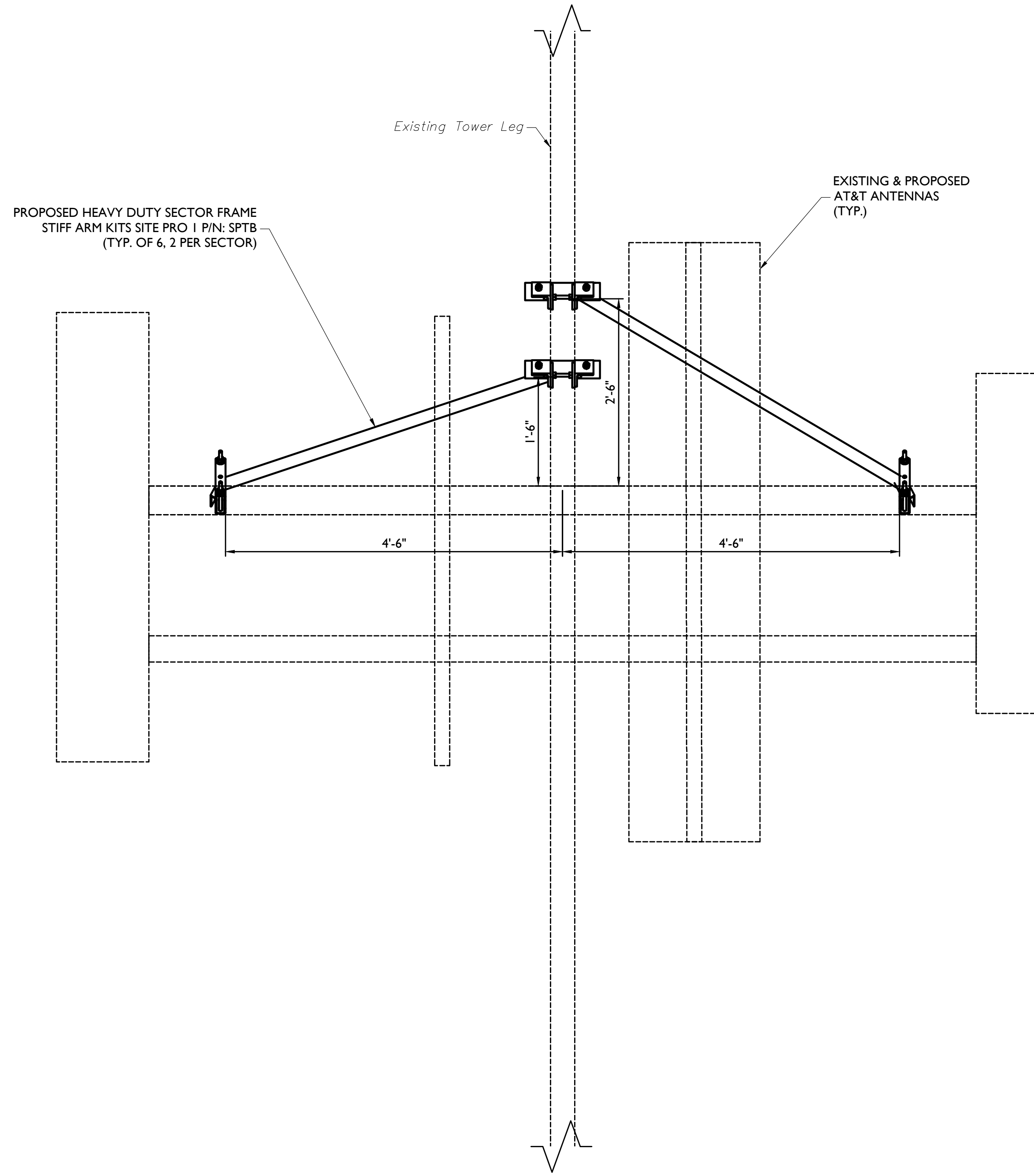
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
GROUNDING AND DETAIL NOTES

SHEET NUMBER :
G-1



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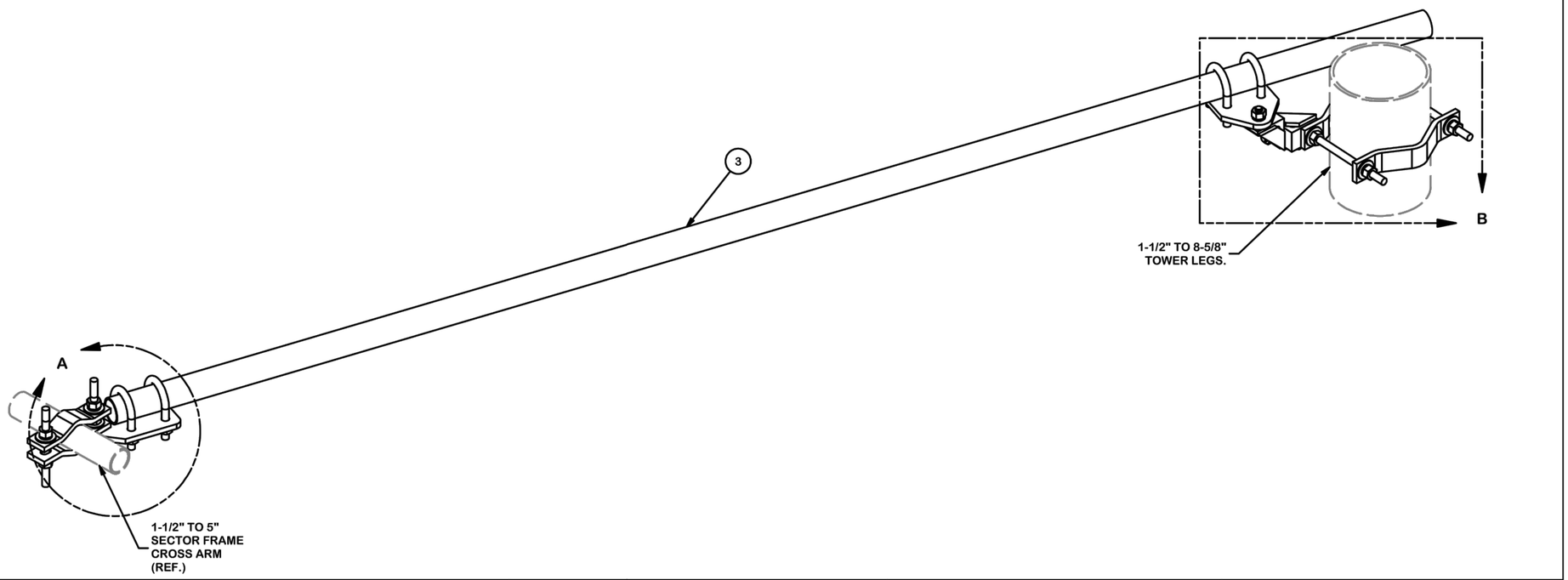
email: solutions@maserconsulting.com

SHEET TITLE :
STRUCTURAL DETAIL

SHEET NUMBER :
S-1

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	11.74
2	2	X-TBCA	TIE BACK CLIP ANGLE		2.08	4.16
3	1	P2126	2-3/8" OD X 126" SCH 40 GALVANIZED PIPE	126 in	40.75	40.75
4	2	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	7.19
5	4	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.42	9.68
6	2	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	2.09
7	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
8	4	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	4.00
9	4	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	1.78
10	2	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	0.54
11	10	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	0.70
12	18	G58LW	5/8" HDG LOCKWASHER		0.03	0.47
13	20	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.60
					TOTAL WT. #	88.49



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: SLIDING PIPE TIE BACK ASSEMBLY

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	CEK 10/19/2016		SPTB	1 OF 3

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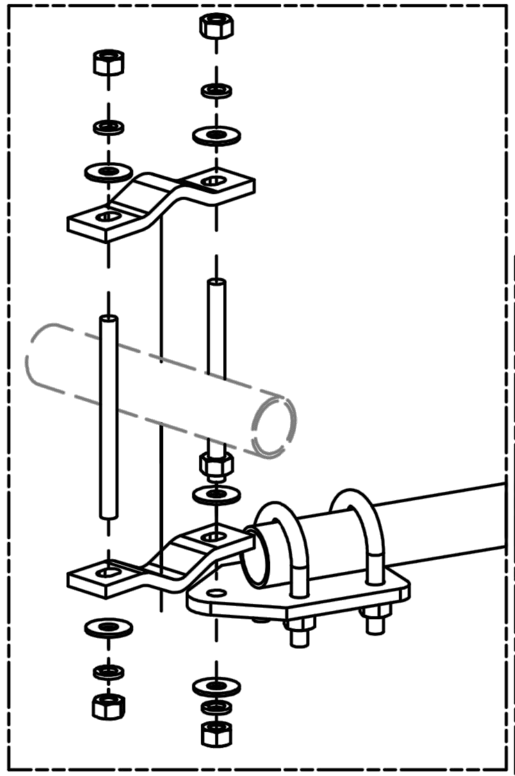
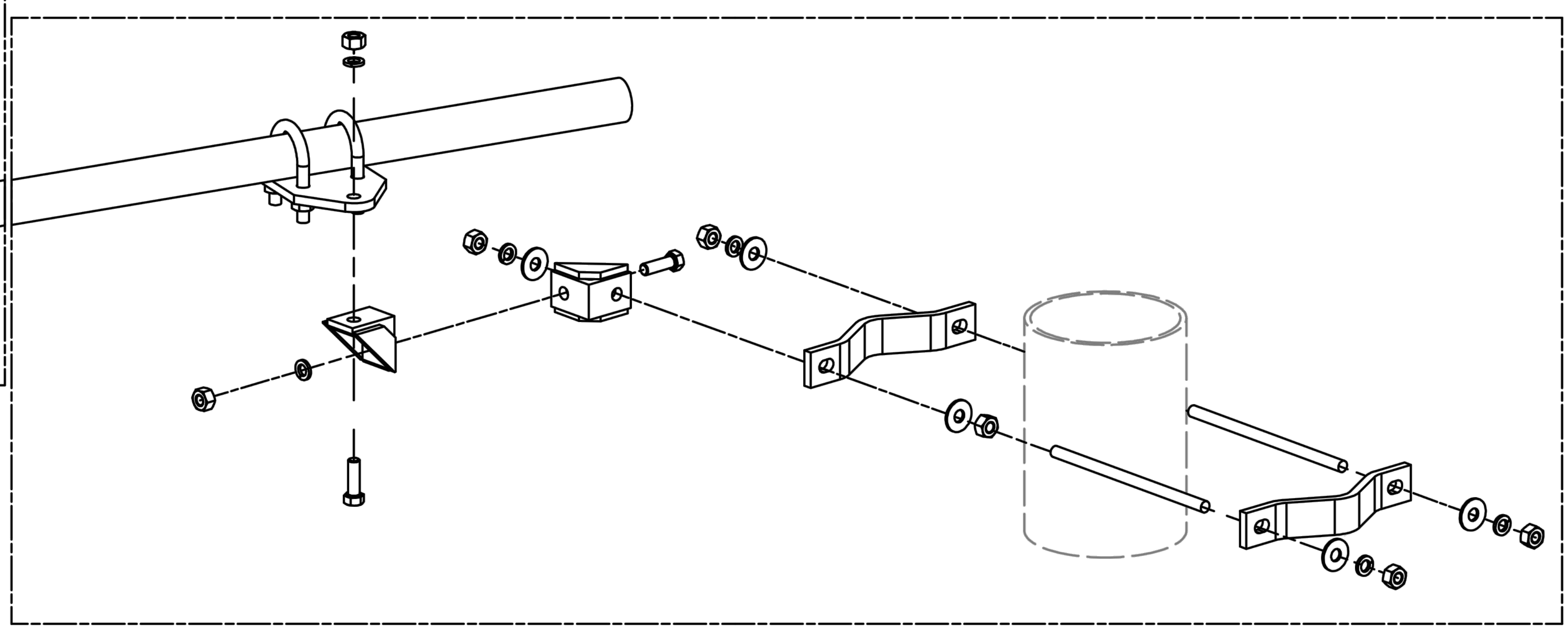
SHEET TITLE: STRUCTURAL DETAIL

SHEET NUMBER: S-2



DETAIL A



DETAIL B

SEE PAGE 3 FOR
HARDWARE DETAILS

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BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
SLIDING PIPE
TIE BACK ASSEMBLY

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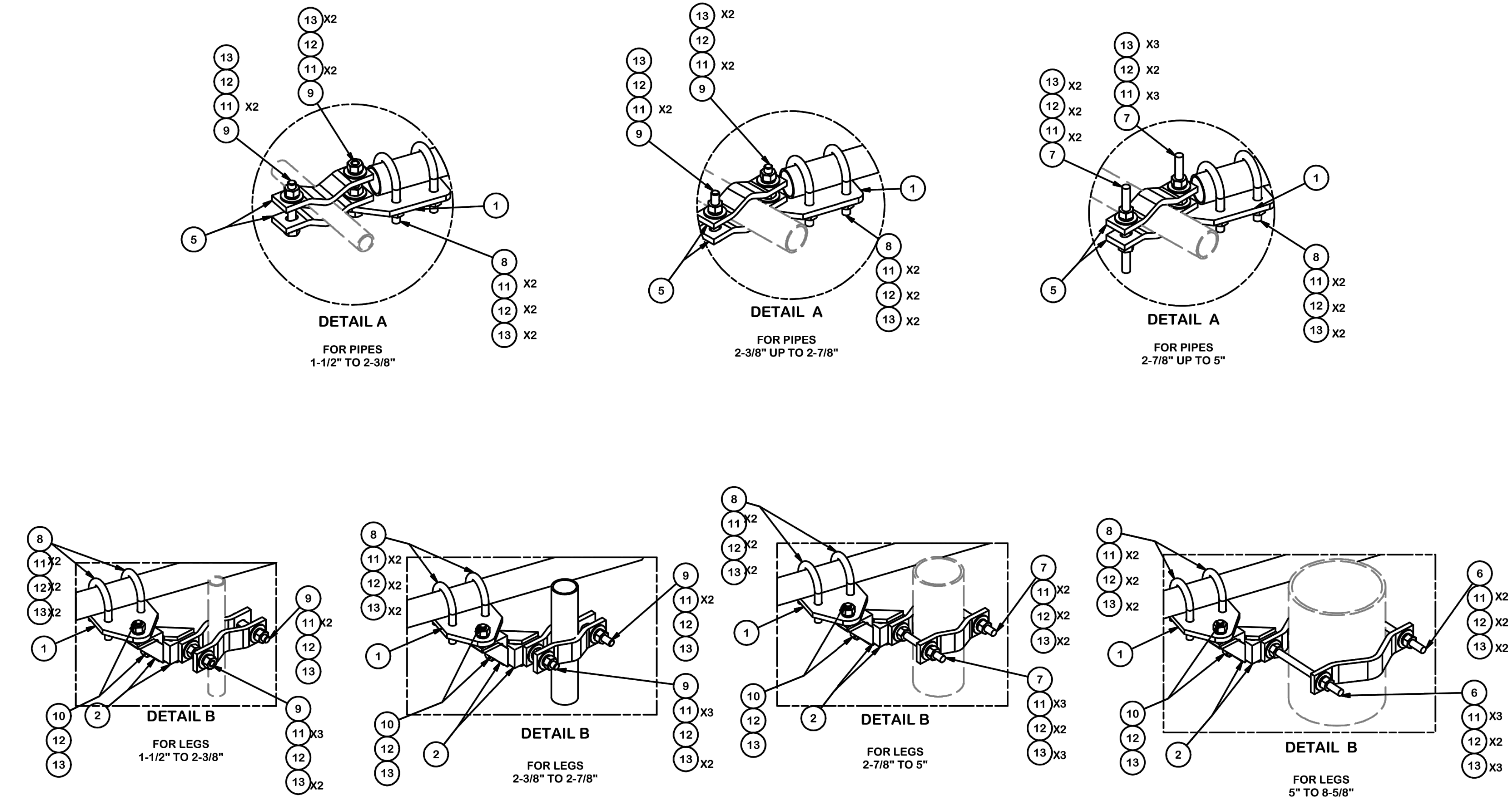
SHEET TITLE :
STRUCTURAL DETAIL

SHEET NUMBER :
S-3



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TIE BACK ASSEMBLY

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PETROS TSOUKALAS
32577
LICENSED PROFESSIONAL ENGINEER

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

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

SITE NAME:

WOLCOTT-NORTH
FA# 10041812
SITE# CTL01111

1233 WOLCOTT ROAD
WOLCOTT, CT 06716
NEW HAVEN COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
STRUCTURAL DETAIL

SHEET NUMBER :
S-3

APPLICATION FOR PLAN EXAMINATION AND BUILDING PERMIT

IMPORTANT – Applicant to complete all items in sections: I, II, III, IV, and IX.

I. LOCATION OF BUILDING

AT (LOCATION) 1235 (NO.) Wolcott Road 1233 (STREET) ZONING DISTRICT Ind.

BETWEEN Boundline (CROSS STREET) AND Idlewood (CROSS STREET)

SUBDIVISION _____ LOT 119 BLOCK 7-A LOT SIZE 3.970 acres

NO. 1233 STREET WOLCOTT ROAD

II. TYPE AND COST OF BUILDING – *All applicants complete Parts A – D*

A. TYPE OF IMPROVEMENT

1 [X] New building
2 [ ] Addition *(If residential, enter number of new housing units added, if any, in Part D, 13)*
3 [ ] Alteration *(See 2 above)*
4 [ ] Repair, replacement
5 [ ] Wrecking *(If multifamily residential, enter number of units in building in Part D, 13)*
6 [ ] Moving (relocation)
7 [ ] Foundation only

B. OWNERSHIP

8 [X] Private (individual, corporation, nonprofit institution, etc.)
9 [ ] Public (Federal, State, or local government)

D. PROPOSED USE – *For "Wrecking" most recent use*

Residential

12 [ ] One family
13 [ ] Two or more family – *Enter number of units* → _____
14 [ ] Transient hotel; motel, or dormitory – *Enter number of units* → _____
15 [ ] Garage
16 [ ] Carport
17 [ ] Other – *Specify* _____

Nonresidential

18 [ ] Amusement, recreational
19 [ ] Church, other religious
20 [ ] Industrial
21 [ ] Parking garage
22 [ ] Service station, repair garage
23 [ ] Hospital, institutional
24 [ ] Office, bank, professional
25 [ ] Public utility
26 [ ] School, library, other educational
27 [ ] Stores, mercantile
28 [XX] Tanks, towers
29 [ ] Other – *Specify* _____

C. COST

	(Omit cents)
10. Cost of improvement	$ 93,000
To be installed but not included in the above cost	
a. Electrical	5,000
b. Plumbing	N/A
c. Heating, air conditioning	N/A
d. Other (elevator, etc.)	N/A
11. TOTAL COST OF IMPROVEMENT	$ 98,000

Nonresidential – Describe in detail proposed use of buildings, e.g., food processing plant, machine shop, laundry building at hospital, elementary school, secondary school, college, parochial school, parking garage for department store, rental office building, office building at industrial plant. If use of existing building is being changed, enter proposed use.

Radio Communications Equipment Storage Buildings and Antenna Support Structure

470.00
5.00
475.00

III. SELECTED CHARACTERISTICS OF BUILDING – *For new buildings and additions, complete Parts E – L; for wrecking, complete only Part J, for all others skip to IV.*

E. PRINCIPAL TYPE OF FRAME

30 [ ] Masonry (wall bearing)
31 [ ] Wood frame
32 [XX] Structural steel
33 [ ] Reinforced concrete
34 [ ] Other – *Specify* _____

G. TYPE OF SEWAGE DISPOSAL N/A

40 [ ] Public or private company
41 [ ] Private (septic tank, etc.)

H. TYPE OF WATER SUPPLY N/A

42 [ ] Public or private company
43 [ ] Private (well, cistern)

F. PRINCIPAL TYPE OF HEATING FUEL

35 [ ] Gas
36 [ ] Oil
37 [X] Electricity
38 [ ] Coal
39 [ ] Other – *Specify* _____

I. TYPE OF MECHANICAL

Will there be central air conditioning?
44 [ ] Yes 45 [XX] No

Will there be an elevator?
46 [ ] Yes 47 [XX] No

J. DIMENSIONS

48. Number of stories	35
49. Total square feet of floor area, all floors, based on exterior dimensions	1225
50. Total land area, sq. ft.	172,938

K. NUMBER OF OFF-STREET PARKING SPACES

51. Enclosed	
52. Outdoors	4

L. RESIDENTIAL BUILDINGS ONLY

53. Number of bedrooms	
54. Number of bathrooms – Full	
54. Number of bathrooms – Partial	

6709

IV. IDENTIFICATION – *To be completed by all applicants*

	Name	Mailing address – *Number, street, city, and State*	ZIP code	Tel. No.
1. Owner or Lessee	AAT Communications Corporation	1854 Hylan Boulevard Staten Island, NY	10305	(718) 979-6600
2. Contractor	Francisco Tower Incorporated	431 East Ellis Street, P.O. Box 249 East Syracuse, NY	Builder's License No. 13057	(315) 437-3059
3. Architect or Engineer	Charles L. Burns	431 East Ellist Street, P.O. Box 249 East Syracuse, NY	13057	(315) 446-3114

I hereby certify that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and we agree to conform to all applicable laws of this jurisdiction.

Signature of applicant	Address	Application date
[signature]	1854 Hylan Blvd S.I. NY 10305	11/6/91

DO NOT WRITE BELOW THIS LINE

V. PLAN REVIEW RECORD – *For office use*

Plans Review Required	Check	Plan Review Fee	Date Plans Started	By	Date Plans Approved	By	Notes
BUILDING		$					
PLUMBING		$					
MECHANICAL		$					
ELECTRICAL		$					
OTHER _____		$					

VI. ADDITIONAL PERMITS REQUIRED OR OTHER JURISDICTION APPROVALS

Permit or Approval	Check	Date Obtained	Number	By	Permit or Approval	Check	Date Obtained	Number	By
BOILER					PLUMBING				
CURB OR SIDEWALK CUT					ROOFING				
ELEVATOR					SEWER				
ELECTRICAL					SIGN OR BILLBOARD				
FURNACE					STREET GRADES				
GRADING					USE OF PUBLIC AREAS				
OIL BURNER					WRECKING				
OTHER _____					OTHER _____				

VII. VALIDATION

David.BarBagallo@SmartInkLLC.com

Building Permit number _____

Building Permit issued _____ 19 ____

Building Permit Fee $ _____

Certificate of Occupancy $ _____

Drain Tile $ _____

Plan Review Fee $ _____

FOR DEPARTMENT USE ONLY

Use Group _____

Fire Grading _____

Live Loading _____

Occupancy Load _____

Approved by: Kenneth Smart

TITLE

DATE November 22, 1991

ZONING PERMIT FEE.....$25.00

WOLCOTT PLANNING AND ZONING COMMISSION

DATE November 22, 1991 PERMIT NO. 3024

A zoning permit is hereby granted to AAT CommunicationsCorp. Lessee (Edward Cleary owner)

1233 ~~1235~~ Wolcott Rd. To install a radio communications equipement storage building and antenna support structure. authorizing building construction and site development activities in accordance with Application for Zoning Permit# 3024 approved by the Zoning Enforcement Officer on November 22,1991

Signed: L.P. Lyon

NOTE: 1. Site plan and Special Permits approved by the Planning and Zoning Commission and Variances granted by the Zoniing Board of Appeals may have been approved or granted subject to conditions, which conditions are also conditions of approval of the Zoning Permit.

2. After completion of any construction and improvements and Prior to the use or occupancy of the premises, a Certificate of Zoning Compliance must be obtained. Such a Certificate of Zoning Compliance must also be obtained prior to a change of use of an existing premises.

OWNER EDWARD CLEARY DATE September 4, 1991

ADDRESS 50 Beach Road, Wolcott, CT TELEPHONE 879-4987

APPLICANT AAT Communications Corporation

ADDRESS 1854 Hylan Blvd., Staten Island, NY 10305 TELEPHONE 1-718-979-6600

The undersigned hereby makes application for a Zoning Permit under the Zoning Regulations of the Town of Wolcott for one or more of the following:

X Use of Land ____ Sign ____ Parking Area

____ Change of use of existing building or structure

____ Outside storage area

X Proposed building or structure and use thereof

____ Change of existing building or storage & use thereof

Zoning District Industrial Address 1235 Wolcott Road, Wolcott

Location: On North side of Wolcott (Street) between Boundline

and Idlewood Town Road: Accepted ____ Unaccepted ____

Description of Proposal Erection and use of antenna support structure (tower) and communication equipment storage building

____ Plan Drawing Attached

*** I attest to the accuracy of information submitted on this application and agree t comply with all regulations of the Town o Wolcott

Date ____ Sign ____

Date September 4, 1991 Authorized Agent William F. Tynan

Sanitation Approval

Chesprocott Health District

by ____

Application Approved ____ Date ____

Sewer & Water Department Approval ____ Date ____

Comments ____

By ____ Date 9/5/91

____ Decision of Zoning Enforcement Officer ____ Site Plan Approval ✓

____ Special Permit Approval ____ Variance or other Approval ____

Zoning Permit # ____ Issued on ____

Application disapproved on ____ because of the following ____

Assessor's Map # 119 Parcel # 7-A

Subdivision, if any: Title _____ Lot #

Inland Wetland Area: Yes: _____ No: _____ Flood Hazard Area: Yes _____

Proposed Use Buildings and Structures

Proposed Use: (Cite from Article 3) Relay towers and facilities - Section 3.1; Part B; B.3

The proposed use is permitted

_____ As matter of right

_____ With Site Plan approval

_____ By Special Permit

_____ Other (describe)

Proposed buildings and structures (for proposals with several buildings, attach appropriat tabulation.

Total floor area for each dwelling unit _____

Total ground coverage of buildings as % of lot _____

Total floor area of all buildings _____

Number of stories _____

Maximum height _____

*****SETBACKS***** Front Yard _____ Rear Yard _____ Side Yard _____ ***** Side Yard _____

If applicable, do plan drawings show off-street parking and loading, outside yard _____

Site development and landscaping, signs, driveway locations?

Parking _____ Yes _____ No

Outside Storage _____ Yes _____ No

Landscaping, etc. _____ Yes _____ No

Signs _____ Yes _____ No

Driveway Location _____ Yes _____ No

As per Article 7, Section 3, Paragraph 3.6.1., Staking is required prior to issuing Zoning Permit.

STATEMENT OF USE

Antenna Support Structure (350 feet in height) and accessory radio communication equipment storage building (15 x 40) for the location of one way and two way radio equipment and related antenna.

TOWN OF WOLCOTT BUILDING PERMIT
OFFICE OF THE BUILDING INSPECTOR

BUILDING PERMIT

DEPT. FILE COPY

AMOUNT PAID

VALIDATION

DATE November 22, 19 91 PERMIT NO. 6969

APPLICANT AAT Communications Inc. ADDRESS 1854 Hylan Boulevard, Staten Island, NY
(NO.) (STREET) (CONTR'S LICENSE)

PERMIT TO install radio tower etc/) STORY NUMBER OF DWELLING UNITS
(TYPE OF IMPROVEMENT) NO. (PROPOSED USE)

AT (LOCATION) 1235 ~~Wolcott~~ Wolcott Road #1233 ZONING DISTRICT
(NO.) (STREET)

BETWEEN (CROSS STREET) AND (CROSS STREET)

SUBDIVISION LOT BLOCK LOT SIZE

BUILDING IS TO BE FT. WIDE BY FT. LONG BY FT. IN HEIGHT AND SHALL CONFORM IN CONSTRUCTION

TO TYPE 1-8 USE GROUP 22 BASEMENT WALLS OR FOUNDATION
(TYPE)

REMARKS: radio communications equipement storage buildings and antenna support structure

AREA OR VOLUME (CUBIC/SQUARE FEET) ESTIMATED COST $ 98,000.00 PERMIT FEE $ 475.00

OWNER AAT Communications Inc. Lessee (Edward Cleary) (Owner)

ADDRESS 1235 Wolcott Road Wolcott, CT 06716 BUILDING DEPT. BY Kenneth Smith

see address abive.

(Affidavit on reverse side of application to be completed by authorized agent of owner)

FORM NO. BOCA-BP 1969

WOLCOTT,CT

VISION GOVERNMENT SOLUTIONS

Welcome

Welcome to the Town of Wolcott Online Assessment Database.

Enter Online Database

The Town of Wolcott contracted with Vision Government Solutions Inc. of Northboro, Massachusetts to assist with the state-mandated revaluation project for the October 1, 2016 Grand List. Both the Assessor's Office and Vision Government Solutions would like to thank the Town of Wolcott residents for their patience and cooperation throughout the 2016 Revaluation project.

Notices of the 2016 revaluation assessments were sent out November 14, 2016.

The information provided in this database reflects the assessed values based upon the October 1, 2016 Revaluation. Assessment equals 70% of the full value. Exemptions are not reflected in these 2016 values.

Do not apply the current tax (mill) rate to your new assessment as the mill rate will change, and using the prior mill rate will not correctly calculate your July 2017 tax bill. The new mill rate will be determined in the Spring of 2017.

DISCLAIMER: This information is provided for your use. No claim that the file is complete or that the file is 100% accurate is made. It is a copy of the Property Record File of the Town and as such is a constant work in progress. You may also view and copy data in the Town Hall.