Tim Whalen, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (781) 375-8318
twhalen@clinellc.com

March 18, 2016

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

RE: Notice of Exempt Modification // Site Number: CT2198
62-1 Boggy Hole Road, Old Lyme CT (Site Name: CT2198)
N 41.3223111 // W -72.3070239

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains (9) antennas at the (145) foot level of the existing 175 foot monopole tower at 62-1 Boggy Hole Road. The tower is owned by Wireless Solutions VI, LLC. The property is owned by Michael Sanders. AT&T now intends to swap antennas for its LTE upgrade. These antennas would be installed at the (145) foot level of the tower. AT&T also intends to install (3) remote radio units and (3) module radio units.

The current proposal involves an antenna swap only; (3) antennas will be removed and replaced with (3) new.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Bonnie Reemsnyder at the Town of Old Lyme, as well as the tower owner, Wireless Solutions VI, LLC (with attention to Ken Thomas) and the ground owner, Michael Sanders.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Attached to accommodate this filing are construction drawings dated 3/18/2016 by Com Ex Consultants, a structural analysis dated 3/8/2016 by Com Ex Consultants and an Emissions Analysis Report dated 2/18/2016 by EBI Consulting.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis by 3/8/2016 dated Com Ex Consultants.

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

Sincerely,

_____

Tim Whalen Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (781) 375-8318
twhalen@centerlincommunications.com

Attachments

cc: Bonnie Reemsnyder, First Selectwoman- as elected official
Wireless Solutions VI, LLC, c/o Ken Thomas- as tower owner
Michael Sanders - as property owner

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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT2198

Old Lyme Boggy Hill Road
62-1 Boggy Hole Road
Old Lyme, CT 06371

February 18, 2016

EBI Project Number: 6216000627

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.48 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
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February 18, 2016

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2198 – Old Lyme Boggy Hill Road**

EBI Consulting was directed to analyze the proposed AT&T facility located at **62-1 Boggy Hole Road, Old Lyme, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **62-1 Boggy Hole Road, Old Lyme, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **CCI HPA-65R-BUU-H4, CCI HPA-65R-BUU-H6 and the Powerwave 7770.00** for transmission in the 700 MHz, 850 MHz and1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerline of the proposed antennas is **145 feet** above ground level (AGL).

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00	Make / Model:	Powerwave 7770.00
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	145 feet	Height (AGL):	145 feet	Height (AGL):	145 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.52**	Antenna B1 MPE%	**0.52**	Antenna C1 MPE%	**0.52**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-BUU-H4	Make / Model:	CCI OPA-65R-BUU-H6	Make / Model:	CCI OPA-65R-BUU-H6
Gain:	10.85 / 13.45 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	145 feet	Height (AGL):	145 feet	Height (AGL):	145 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	4,115.14	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	**1.08**	Antenna B2 MPE%	**1.42**	Antenna C2 MPE%	**1.42**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.85 dBd	Gain:	13.85 dBd	Gain:	13.85 dBd
Height (AGL):	145 feet	Height (AGL):	145 feet	Height (AGL):	145 feet
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	1,455.97	ERP (W):	1,455.97	ERP (W):	1,455.97
Antenna A3 MPE%	**0.48**	Antenna B3 MPE%	**0.48**	Antenna C3 MPE%	**0.48**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.41 %**
Nextel	0.36 %
T-Mobile	0.60 %
Verizon Wireless	2.11 %
Site Total MPE %:	**5.48 %**

AT&T Sector 1 Total:	2.07 %
AT&T Sector 2 Total:	2.41 %
AT&T Sector 3 Total:	2.41 %
Site Total:	5.48 %

AT&T _ Max Per Sector (Sectors B & C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	145	1.54	850	567	0.27 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	145	2.44	1900	1000	0.24 %
AT&T 700 MHz LTE	2	940.05	145	3.50	700	467	0.75 %
AT&T 1900 MHz (PCS) LTE	2	1791.23	145	6.67	1900	1000	0.67 %
AT&T 850 MHz GSM	2	727.98	145	2.71	850	567	0.48 %
						Total:	2.41 %

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Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector 1:	2.07%
Sector 2:	2.41%
Sector 3 :	2.41%
AT&T Maximum Total (per sector):	2.41 %
Site Total:	5.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.48%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

STRUCTURAL ANALYSIS REPORT
MONOPOLE

Prepared For:

Com-Ex Consultants, LLC
115 Route 46 – Suite E39
Mountain Lakes, NJ 07046

Structure Rating:

Monopole:	**Pass**
Foundation:	**Pass**

Sincerely,
Destek Engineering, LLC

03-08-2016

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

AT&T Site ID: CT2198
FA Number: 10035430
Site Name: Old Lymeboggyhill Rd
62-1 Boggy Hole Road
Old Lyme, CT 06371

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing telecommunication installation on the monopole at 62-1 Boggy Hole Road, Old Lyme, CT 06371 for the additions and alterations proposed by AT&T.

The structural analysis is based on the following information provided to Destek Engineering, LLC (Destek):

- Construction Drawings prepared by Com-Ex Consultants, dated 11/20/2015.
- Structural Analysis Report prepared by Centek, Project Number 14001.037, dates 01/06/2015.
- RFDS prepared by AT&T, dated 09/17/2015.

1.1 STRUCTURE

The structure is a 175'-0" tall, 18 sided monopole, which is attached to the foundation with anchor bolts and base plate. Please refer to the software output in Appendix A, for tower geometry, member sizes, and other details.

ELEVATION (FEET)	SECTION LENGTH (FEET)	LAP SPLICE (FEET)	SHAFT THICKNESS (IN)	TOP DIAMETER (IN)	BOTTOM DIAMETER (IN)	YIELD STRENGTH (KSI)
175.00-154.87	20.13	4.25	0.188	24.210	29.45	65
154.87-116.29	42.83	5.42	0.375	27.969	38.99	65
116.29-74.17	47.54	6.67	0.500	36.845	49.07	65
74.17-33.34	47.50	7.83	0.563	46.355	58.58	65
33.34-0.00	41.17	-	0.625	55.44	66.00	65

2.0 EXISTING AND PROPOSED APPURTENANCES

Existing Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
145.0	(3) 7700.00 (1) AM-X-CD-14-65-00T-RET (5) AM-X-CD-16-65-00T-RET (6) TT19-08BP11-0001 (6) CCI DTMABP7819VG12A (3) RRUS 11 (1) DC6	(1) Platform Mount	(12) 1-5/8" (2) DC Cables (1) Fiber (Inside Shaft)

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Proposed and Final Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
145.0	(3) 7700.00 (1) HPA-65R-BUU-H4 (2) HPA-65R-BUU-H6 (3) AM-X-CD-16-65-00T-RET (6) TT19-08BP11-001 (6) CCI DTMABP7819VG12A (3) RRUS 11 (3) RRUS-12 w/A2 Module (1) DC6	(1) Platform Mount	(12) 1-5/8” (2) DC Cables (1) Fiber (Inside Shaft)

Existing Appurtenances by Others

Rad. Center (ft) Carrier	Antenna & TMA	Mount	Cables
175.0 T-Mobile	(6) AIR 21 (3) KRY 112	(1) 14’ Low Profile Platform	(13) 1-5/8” (Inside Shaft)
162.0 Verizon	(3) BXA-70063-6CF (6) Andrew HBXX-6517DS (3) LNX-6514DS-VTM (3) RRH2x40-AWS (3) RRH2x60-PCS (3) RRH2x40-07-U (2) DB-T1-6Z-8AB-0Z	(1) 14’ Low Profile Platform	(12) 1-5/8” (Inside Shaft) (2) 1-5/8” (Outside Shaft)
152.0 MetroPCS	(6) RFS APXC18-206516S-C	(1) 14’ Low Profile Platform	(12) 1-5/8” (Inside Shaft)

3.0 CODES AND LOADING

The Monopole was analyzed per *TIA/EIA-222-F* as referenced by *2005 State Building Code with all adopted amendments and supplements, International Code Council*. The following wind loading was used in compliance with the standard for New London County:

- Basic wind speed 95 mph without ice (W)
- Basic wind speed 37.6 mph with 3/4” radial ice (W_i)

The following load combinations were used with wind blowing at 0^o, 60^o and 90^o, measured from a line normal to the face of the tower.

- D + W
- D + W_i + I

D: Dead Load W: Wind Load, without ice
W_i: Wind Load with ice I: Ice Gravity Load

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4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure is assumed to be in good condition, free of defects, and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service lifespan. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the antenna mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis. Additionally, the proposed linear appurtenances should be placed per recommendations of this report.

5.0 ANALYSIS AND RESULTS

The Monopole was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

6.0 RESULTS AND CONCLUSION

Based on analysis per TIA/EIA-222-F, the existing monopole is found to have **adequate** structural capacity for the proposed changes by AT&T. As a maximum, the monopole shaft between 33.34 feet and 74.17 feet is stressed to **58.2%** of its capacity. The anchor rods, base plate and foundation are also found to have **adequate** capacity. As a maximum, the anchor rods and base plate are stressed to **51.1%** and **69.7%** of their capacity, respectively. The foundation is stressed to **71.9%** of its capacity.

Therefore, the proposed additions and alterations by AT&T **can** be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

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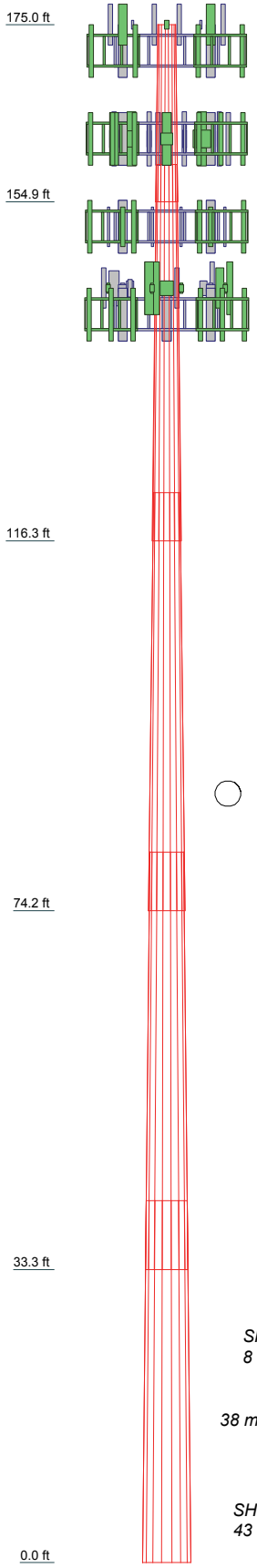
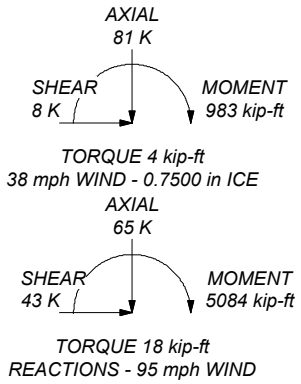
APPENDIX A
CALCULATIONS

Section	1	2	3	4	5
Length (ft)	20.13	42.83	47.54	47.50	41.17
Number of Sides	18	18	18	18	18
Thickness (in)	0.1875	0.3750	0.5000	0.5630	0.6250
Socket Length (ft)	4.25	5.42	6.67	7.83	
Top Dia (in)	24.2100	27.9687	36.8453	46.3548	55.4388
Bot Dia (in)	29.4500	38.9900	49.0700	58.5800	66.0000
Grade			A572-65		
Weight (K)	1.1	5.7	10.9	15.0	16.7

49.4





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) AIR21 B2A/B4P	175	APXV18-206516S-C-A20	152
(2) AIR21 B2A/B4P	175	APXV18-206516S-C-A20	152
(2) AIR21 B2A/B4P	175	APXV18-206516S-C-A20	152
KRY 112 71	175	APXV18-206516S-C-A20	152
KRY 112 71	175	APXV18-206516S-C-A20	152
KRY 112 71	175	APXV18-206516S-C-A20	152
EEI 14ft Low Profile Platform	172	EEI 14ft Low Profile Platform	152
BXA-70063/6CF	162	7770.00	145
BXA-70063/6CF	162	7770.00	145
BXA-70063/6CF	162	7770.00	145
LNX-6514DS-VTM	162	HPA-65R-BUU-H4	145
LNX-6514DS-VTM	162	HPA-65R-BUU-H6	145
LNX-6514DS-VTM	162	HPA-65R-BUU-H6	145
HBXX-6517DS-VTM	162	AM-X-CD-16-65-00T-RET	145
HBXX-6517DS-VTM	162	AM-X-CD-16-65-00T-RET	145
HBXX-6517DS-VTM	162	AM-X-CD-16-65-00T-RET	145
HBXX-6517DS-VTM	162	RRUS 11	145
HBXX-6517DS-VTM	162	RRUS 11	145
HBXX-6517DS-VTM	162	RRUS 11	145
RRH2X60-PCS	162	(2) TT08-19DB111-001	145
RRH2X60-PCS	162	(2) TT08-19DB111-001	145
RRH2X60-PCS	162	(2) TT08-19DB111-001	145
RRH2x40-07U	162	(2) DTMABP7819VG12A	145
RRH2x40-07U	162	(2) DTMABP7819VG12A	145
RRH2x40-07U	162	(2) DTMABP7819VG12A	145
RRH2x40-AWS	162	RRUS 12 B2/RRUS A2	145
RRH2x40-AWS	162	RRUS 12 B2/RRUS A2	145
RRH2x40-AWS	162	RRUS 12 B2/RRUS A2	145
DB-B1-6C-8AB-0Z	162	DC6-48-60-18-8F	145
DB-B1-6C-8AB-0Z	162	EEI 14ft Low Profile Platform	142
EEI 14ft Low Profile Platform	162		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 58.2%

DESTEK ENGINEERING
Destek Engineering, LLC
1281 Kennestone Circle, Suite 100
Marietta, GA 30066
Phone: (770) 693 0835
FAX:

Job: ***CT2198 -15134 Emp***			
Project: ***1629035***			
Client: Com-EX	Drawn by: Ahmet Colakoglu	App'd:	
Code: TIA/EIA-222-F	Date: 03/08/16	Scale: NTS	
Path: Z:\Projects\2016\29 - Com-Ex\035 - CT2198 - 15134-Emp\Tnxtower\15134-Emp.eri		Dwg No. E-1	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 95 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
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		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	175.00-154.87	20.13	4.25	18	24.2100	29.4500	0.1875	0.7500	A572-65 (65 ksi)
L2	154.87-116.29	42.83	5.42	18	27.9687	38.9900	0.3750	1.5000	A572-65 (65 ksi)
L3	116.29-74.17	47.54	6.67	18	36.8453	49.0700	0.5000	2.0000	A572-65 (65 ksi)
L4	74.17-33.34	47.50	7.83	18	46.3548	58.5800	0.5630	2.2520	A572-65 (65 ksi)
L5	33.34-0.00	41.17		18	55.4388	66.0000	0.6250	2.5000	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.5835	14.2964	1042.3180	8.5280	12.2987	84.7504	2086.0076	7.1496	3.9310	20.965
	29.9043	17.4148	1883.9958	10.3882	14.9606	125.9305	3770.4706	8.7091	4.8532	25.884
L2	29.5107	32.8434	3159.4030	9.7958	14.2081	222.3664	6322.9633	16.4248	4.2625	11.367
	39.5915	45.9615	8658.5219	13.7083	19.8069	437.1463	17328.4368	22.9851	6.2022	16.539
L3	38.8289	57.6800	9626.2851	12.9026	18.7174	514.2959	19265.2367	28.8455	5.6048	11.21
	49.8270	77.0806	22973.0516	17.2423	24.9276	921.5925	45976.3317	38.5476	7.7563	15.513
L4	48.8131	81.8283	21677.8879	16.2561	23.5483	920.5729	43384.3001	40.9219	7.1676	12.731
	59.4837	103.6742	44087.8146	20.5960	29.7586	1481.5131	88233.6411	51.8469	9.3192	16.553
L5	58.3336	108.7368	41275.6194	19.4589	28.1629	1465.6026	82605.5504	54.3787	8.6572	13.852
	67.0182	129.6877	70026.0284	23.2081	33.5280	2088.5835	140144.1989	64.8562	10.5160	16.826

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
L1 175.00-154.87				1	1	1		
L2 154.87-116.29				1	1	1		
L3 116.29-74.17				1	1	1		
L4 74.17-33.34				1	1	1		
L5 33.34-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
173ft								
LDF7-50A(1-5/8")	B	No	Inside Pole	173.00 - 3.00	13	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
163ft								
LDF7-50A(1-5/8")	B	No	Inside Pole	163.00 - 3.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	163.00 - 3.00	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00
						1" Ice	0.40	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						2" Ice	0.60	0.01
						4" Ice	1.00	0.03
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	163.00 - 3.00	1	No Ice	0.20	0.00
						1/2" Ice	0.30	0.00
						1" Ice	0.40	0.00
						2" Ice	0.60	0.01
						4" Ice	1.00	0.03
153ft								
LDF7-50A(1-5/8")	B	No	Inside Pole	153.00 - 3.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
143ft								
LDF7-50A(1-5/8")	B	No	Inside Pole	143.00 - 3.00	15	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00

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
L1	175.00-154.87	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	3.219	0.29
		C	0.000	0.000	0.000	0.000	0.00
L2	154.87-116.29	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	15.278	1.54
		C	0.000	0.000	0.000	0.000	0.00
L3	116.29-74.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	16.680	1.87
		C	0.000	0.000	0.000	0.000	0.00
L4	74.17-33.34	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	16.169	1.81
		C	0.000	0.000	0.000	0.000	0.00
L5	33.34-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	12.015	1.34
		C	0.000	0.000	0.000	0.000	0.00

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
L1	175.00-154.87	A	0.910	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	6.177	0.34
		C		0.000	0.000	0.000	0.000	0.00
L2	154.87-116.29	A	0.888	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	29.314	1.80
		C		0.000	0.000	0.000	0.000	0.00
L3	116.29-74.17	A	0.851	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	31.641	2.13
		C		0.000	0.000	0.000	0.000	0.00

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
L4	74.17-33.34	A	0.795	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	30.070	2.05
		C		0.000	0.000	0.000	0.000	0.00
L5	33.34-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	21.663	1.51
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	175.00-154.87	0.2052	0.1185	0.3501	0.2021
L2	154.87-116.29	0.4514	0.2606	0.7469	0.4312
L3	116.29-74.17	0.4639	0.2678	0.7824	0.4517
L4	74.17-33.34	0.4723	0.2727	0.7988	0.4612
L5	33.34-0.00	0.4348	0.2510	0.7281	0.4204

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
175ft									
(2) AIR21 B2A/B4P	A	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.07 0.11 0.16 0.27 0.56
(2) AIR21 B2A/B4P	B	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.07 0.11 0.16 0.27 0.56
(2) AIR21 B2A/B4P	C	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.07 0.11 0.16 0.27 0.56
KRY 112 71	A	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
KRY 112 71	B	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.68 0.80 0.93 1.22	0.45 0.56 0.68 0.94	0.01 0.02 0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	1.90	1.57	0.11
KRY 112 71	C	From Face	3.50 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
EEI 14ft Low Profile Platform	C	From Face	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.50 20.00 23.50 30.50 44.50	16.50 20.00 23.50 30.50 44.50	1.55 1.80 2.05 2.55 3.55
162ft									
BXA-70063/6CF	A	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	3.76 4.20 4.64 5.54 7.44	0.02 0.06 0.10 0.22 0.52
BXA-70063/6CF	B	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	3.76 4.20 4.64 5.54 7.44	0.02 0.06 0.10 0.22 0.52
BXA-70063/6CF	C	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.74 8.28 8.83 9.94 12.29	3.76 4.20 4.64 5.54 7.44	0.02 0.06 0.10 0.22 0.52
LNX-6514DS-VTM	A	From Face	3.50 6.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.41 8.96 9.52 10.67 13.07	5.41 5.86 6.33 7.28 9.43	0.04 0.09 0.15 0.28 0.63
LNX-6514DS-VTM	B	From Face	3.50 6.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.41 8.96 9.52 10.67 13.07	5.41 5.86 6.33 7.28 9.43	0.04 0.09 0.15 0.28 0.63
LNX-6514DS-VTM	C	From Face	3.50 6.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.41 8.96 9.52 10.67 13.07	5.41 5.86 6.33 7.28 9.43	0.04 0.09 0.15 0.28 0.63
HBXX-6517DS-VTM	A	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63
HBXX-6517DS-VTM	B	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63
HBXX-6517DS-VTM	C	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
HBXX-6517DS-VTM	A	From Face	3.50 -4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63
HBXX-6517DS-VTM	B	From Face	3.50 -4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63
HBXX-6517DS-VTM	C	From Face	3.50 -4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.74 9.31 9.88 11.06 13.52	5.24 5.71 6.18 7.15 9.23	0.04 0.09 0.15 0.28 0.63
RRH2X60-PCS	A	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	B	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2X60-PCS	C	From Face	3.50 4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	0.06 0.08 0.10 0.16 0.31
RRH2x40-07U	A	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.29 2.49 2.70 3.15 4.16	1.21 1.36 1.53 1.89 2.71	0.05 0.07 0.09 0.13 0.27
RRH2x40-07U	B	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.29 2.49 2.70 3.15 4.16	1.21 1.36 1.53 1.89 2.71	0.05 0.07 0.09 0.13 0.27
RRH2x40-07U	C	From Face	3.50 0.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.29 2.49 2.70 3.15 4.16	1.21 1.36 1.53 1.89 2.71	0.05 0.07 0.09 0.13 0.27
RRH2x40-AWS	A	From Face	3.50 -4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	B	From Face	3.50 -4.00 0.00	0.0000	162.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	C	From Face	3.50 -4.00	0.0000	162.00	No Ice 1/2" Ice	2.52 2.75	1.59 1.80	0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.99	2.01	0.08
						2" Ice	3.50	2.46	0.13
						4" Ice	4.61	3.48	0.28
DB-B1-6C-8AB-0Z	A	From Face	3.50	0.0000	162.00	No Ice	5.60	2.33	0.04
			-4.00			1/2" Ice	5.92	2.56	0.08
			0.00			1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
DB-B1-6C-8AB-0Z	C	From Face	3.50	0.0000	162.00	No Ice	5.60	2.33	0.04
			-4.00			1/2" Ice	5.92	2.56	0.08
			0.00			1" Ice	6.24	2.79	0.12
						2" Ice	6.91	3.28	0.21
						4" Ice	8.37	4.37	0.45
EEI 14ft Low Profile Platform	C	From Face	2.00	0.0000	162.00	No Ice	16.50	16.50	1.55
			0.00			1/2" Ice	20.00	20.00	1.80
			0.00			1" Ice	23.50	23.50	2.05
						2" Ice	30.50	30.50	2.55
						4" Ice	44.50	44.50	3.55
152ft									
APXV18-206516S-C-A20	A	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			-5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
APXV18-206516S-C-A20	B	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			-5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
APXV18-206516S-C-A20	C	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			-5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
APXV18-206516S-C-A20	A	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
APXV18-206516S-C-A20	B	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
APXV18-206516S-C-A20	C	From Face	3.50	0.0000	152.00	No Ice	3.62	2.01	0.02
			5.00			1/2" Ice	3.97	2.33	0.04
			0.00			1" Ice	4.36	2.66	0.06
						2" Ice	5.19	3.35	0.13
						4" Ice	6.95	4.82	0.31
EEI 14ft Low Profile Platform	C	From Face	2.00	0.0000	152.00	No Ice	16.50	16.50	1.55
			0.00			1/2" Ice	20.00	20.00	1.80
			0.00			1" Ice	23.50	23.50	2.05
						2" Ice	30.50	30.50	2.55
						4" Ice	44.50	44.50	3.55
145ft									
7770.00	A	From Face	3.50	0.0000	145.00	No Ice	5.88	2.93	0.04
			-6.00			1/2" Ice	6.31	3.27	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	6.75	3.63	0.11
						2" Ice	7.66	4.35	0.20
						4" Ice	9.58	6.06	0.44
7770.00	B	From Face	3.50	0.0000	145.00	No Ice	5.88	2.93	0.04
			-6.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
						2" Ice	7.66	4.35	0.20
						4" Ice	9.58	6.06	0.44
7770.00	C	From Face	3.50	0.0000	145.00	No Ice	5.88	2.93	0.04
			-6.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
						2" Ice	7.66	4.35	0.20
						4" Ice	9.58	6.06	0.44
HPA-65R-BUU-H4	A	From Leg	3.50	0.0000	145.00	No Ice	6.91	4.20	0.03
			-6.00			1/2" Ice	7.32	4.57	0.08
			0.00			1" Ice	7.74	4.96	0.13
						2" Ice	8.60	5.75	0.24
						4" Ice	10.44	7.43	0.53
HPA-65R-BUU-H6	B	From Leg	3.50	0.0000	145.00	No Ice	10.36	6.45	0.05
			-6.00			1/2" Ice	10.93	6.91	0.11
			0.00			1" Ice	11.50	7.38	0.18
						2" Ice	12.68	8.47	0.34
						4" Ice	15.14	10.78	0.75
HPA-65R-BUU-H6	C	From Leg	3.50	0.0000	145.00	No Ice	10.36	6.45	0.05
			-6.00			1/2" Ice	10.93	6.91	0.11
			0.00			1" Ice	11.50	7.38	0.18
						2" Ice	12.68	8.47	0.34
						4" Ice	15.14	10.78	0.75
AM-X-CD-16-65-00T-RET	B	From Face	3.50	0.0000	145.00	No Ice	8.26	4.64	0.05
			2.00			1/2" Ice	8.81	5.09	0.09
			0.00			1" Ice	9.36	5.54	0.15
						2" Ice	10.50	6.47	0.27
						4" Ice	12.88	8.45	0.60
AM-X-CD-16-65-00T-RET	C	From Face	3.50	0.0000	145.00	No Ice	8.26	4.64	0.05
			2.00			1/2" Ice	8.81	5.09	0.09
			0.00			1" Ice	9.36	5.54	0.15
						2" Ice	10.50	6.47	0.27
						4" Ice	12.88	8.45	0.60
AM-X-CD-16-65-00T-RET	C	From Face	3.50	0.0000	145.00	No Ice	8.26	4.64	0.05
			2.00			1/2" Ice	8.81	5.09	0.09
			0.00			1" Ice	9.36	5.54	0.15
						2" Ice	10.50	6.47	0.27
						4" Ice	12.88	8.45	0.60
RRUS 11	A	From Face	3.50	0.0000	145.00	No Ice	3.25	1.37	0.05
			0.00			1/2" Ice	3.49	1.55	0.07
			0.00			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
RRUS 11	B	From Face	3.50	0.0000	145.00	No Ice	3.25	1.37	0.05
			0.00			1/2" Ice	3.49	1.55	0.07
			0.00			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
RRUS 11	C	From Face	3.50	0.0000	145.00	No Ice	3.25	1.37	0.05
			0.00			1/2" Ice	3.49	1.55	0.07
			0.00			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	5.43	3.04	0.31
(2) TT08-19DB111-001	A	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.92 1.06 1.21 1.54 2.29	0.75 0.88 1.02 1.32 2.04	0.02 0.03 0.04 0.06 0.15
(2) TT08-19DB111-001	B	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.92 1.06 1.21 1.54 2.29	0.75 0.88 1.02 1.32 2.04	0.02 0.03 0.04 0.06 0.15
(2) TT08-19DB111-001	C	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.92 1.06 1.21 1.54 2.29	0.75 0.88 1.02 1.32 2.04	0.02 0.03 0.04 0.06 0.15
(2) DTMABP7819VG12A	A	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) DTMABP7819VG12A	B	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
(2) DTMABP7819VG12A	C	From Leg	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14
RRUS 12 B2/RRUS A2	A	From Face	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	2.16 2.36 2.58 3.04 4.06	0.07 0.10 0.13 0.20 0.40
RRUS 12 B2/RRUS A2	B	From Face	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	2.16 2.36 2.58 3.04 4.06	0.07 0.10 0.13 0.20 0.40
RRUS 12 B2/RRUS A2	C	From Face	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	2.16 2.36 2.58 3.04 4.06	0.07 0.10 0.13 0.20 0.40
DC6-48-60-18-8F	A	From Face	3.50 0.00 0.00	0.0000	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	2.57 2.80 3.04 3.54 4.66	0.02 0.04 0.07 0.13 0.30
EEI 14ft Low Profile Platform	C	From Face	2.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.50 20.00 23.50 30.50 44.50	16.50 20.00 23.50 30.50 44.50	1.55 1.80 2.05 2.55 3.55

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	175 - 154.87	Pole	Max Tension	14	0.00	0.00	0.00
			Max. Compression	14	-9.10	0.17	-13.21
			Max. Mx	11	-4.80	83.76	-9.23
			Max. My	8	-4.77	-0.18	-93.87
			Max. Vy	11	-12.56	83.76	-9.23
			Max. Vx	8	12.67	-0.18	-93.87

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	11			7.85
L2	154.87 - 116.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.07	-0.41	-28.58
			Max. Mx	5	-15.12	-841.74	-21.84
			Max. My	8	-15.07	-1.44	-872.71
			Max. Vy	5	25.53	-841.74	-21.84
			Max. Vx	8	25.89	-1.44	-872.71
			Max. Torque	5			-17.67
L3	116.29 - 74.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.25	-0.93	-29.45
			Max. Mx	5	-27.20	-2006.49	-22.24
			Max. My	8	-27.17	-1.31	-2052.47
			Max. Vy	5	31.47	-2006.49	-22.24
			Max. Vx	8	31.84	-1.31	-2052.47
			Max. Torque	5			-17.78
L4	74.17 - 33.34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-56.66	-1.52	-30.13
			Max. Mx	5	-43.37	-3369.69	-22.35
			Max. My	8	-43.36	-1.19	-3430.13
			Max. Vy	5	37.10	-3369.69	-22.35
			Max. Vx	8	37.47	-1.19	-3430.13
			Max. Torque	5			-17.90
L5	33.34 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-80.78	-2.12	-30.48
			Max. Mx	5	-64.99	-5009.13	-22.24
			Max. My	8	-64.99	-1.06	-5084.26
			Max. Vy	5	42.47	-5009.13	-22.24
			Max. Vx	8	42.83	-1.06	-5084.26
			Max. Torque	5			-18.02

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	80.78	-0.00	-0.00
	Max. H_x	11	65.01	42.45	-0.01
	Max. H_z	2	65.01	-0.01	42.81
	Max. M_x	2	5041.00	-0.01	42.81
	Max. M_z	5	5009.13	-42.45	0.01
	Max. Torsion	11	18.02	42.45	-0.01
	Min. Vert	33	65.01	0.00	-11.86
	Min. H_x	5	65.01	-42.45	0.01
	Min. H_z	8	65.01	0.01	-42.81
	Min. M_x	8	-5084.26	0.01	-42.81
	Min. M_z	11	-5008.20	42.45	-0.01
	Min. Torsion	5	-18.02	-42.45	0.01

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	65.01	0.00	0.00	21.62	-0.46	0.00
Dead+Wind 0 deg - No Ice	65.01	0.01	-42.81	-5041.00	0.14	1.25
Dead+Wind 30 deg - No Ice	65.01	21.23	-37.07	-4362.45	-2504.25	10.09
Dead+Wind 60 deg - No Ice	65.01	36.77	-21.41	-2509.19	-4337.78	16.23
Dead+Wind 90 deg - No Ice	65.01	42.45	-0.01	22.24	-5009.13	18.02
Dead+Wind 120 deg - No Ice	65.01	36.76	21.40	2553.49	-4338.37	14.98
Dead+Wind 150 deg - No Ice	65.01	21.22	37.07	4406.31	-2505.29	7.92
Dead+Wind 180 deg - No Ice	65.01	-0.01	42.81	5084.26	-1.06	-1.25
Dead+Wind 210 deg - No Ice	65.01	-21.23	37.07	4405.72	2503.33	-10.09
Dead+Wind 240 deg - No Ice	65.01	-36.77	21.41	2552.46	4336.85	-16.23
Dead+Wind 270 deg - No Ice	65.01	-42.45	0.01	21.04	5008.20	-18.02
Dead+Wind 300 deg - No Ice	65.01	-36.76	-21.40	-2510.22	4337.45	-14.98
Dead+Wind 330 deg - No Ice	65.01	-21.22	-37.07	-4363.05	2504.36	-7.93
Dead+Ice+Temp	80.78	0.00	0.00	30.48	-2.12	0.00
Dead+Wind 0 deg+Ice+Temp	80.78	0.00	-7.88	-922.25	-2.02	0.32
Dead+Wind 30 deg+Ice+Temp	80.78	3.91	-6.82	-794.54	-474.02	2.17
Dead+Wind 60 deg+Ice+Temp	80.78	6.77	-3.94	-445.73	-819.57	3.44
Dead+Wind 90 deg+Ice+Temp	80.78	7.82	-0.00	30.72	-946.09	3.78
Dead+Wind 120 deg+Ice+Temp	80.78	6.77	3.94	507.14	-819.68	3.11
Dead+Wind 150 deg+Ice+Temp	80.78	3.91	6.82	855.87	-474.20	1.61
Dead+Wind 180 deg+Ice+Temp	80.78	-0.00	7.88	983.48	-2.23	-0.32
Dead+Wind 210 deg+Ice+Temp	80.78	-3.91	6.82	855.77	469.77	-2.17
Dead+Wind 240 deg+Ice+Temp	80.78	-6.77	3.94	506.96	815.32	-3.44
Dead+Wind 270 deg+Ice+Temp	80.78	-7.82	0.00	30.51	941.84	-3.78
Dead+Wind 300 deg+Ice+Temp	80.78	-6.77	-3.94	-445.91	815.43	-3.11
Dead+Wind 330 deg+Ice+Temp	80.78	-3.91	-6.82	-794.65	469.95	-1.61
Dead+Wind 0 deg - Service	65.01	0.00	-11.86	-1381.38	-0.30	0.35
Dead+Wind 30 deg - Service	65.01	5.88	-10.27	-1193.32	-694.38	2.81
Dead+Wind 60 deg - Service	65.01	10.19	-5.93	-679.69	-1202.54	4.52
Dead+Wind 90 deg - Service	65.01	11.76	-0.00	21.89	-1388.60	5.01
Dead+Wind 120 deg - Service	65.01	10.18	5.93	723.42	-1202.70	4.17
Dead+Wind 150 deg - Service	65.01	5.88	10.27	1236.93	-694.67	2.21
Dead+Wind 180 deg - Service	65.01	-0.00	11.86	1424.83	-0.63	-0.35
Dead+Wind 210 deg - Service	65.01	-5.88	10.27	1236.77	693.46	-2.81
Dead+Wind 240 deg - Service	65.01	-10.19	5.93	723.13	1201.61	-4.51
Dead+Wind 270 deg - Service	65.01	-11.76	0.00	21.56	1387.67	-5.01
Dead+Wind 300 deg - Service	65.01	-10.18	-5.93	-679.97	1201.78	-4.17
Dead+Wind 330 deg - Service	65.01	-5.88	-10.27	-1193.49	693.75	-2.21

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-65.01	0.00	0.00	65.01	-0.00	0.000%
2	0.01	-65.01	-42.81	-0.01	65.01	42.81	0.000%
3	21.23	-65.01	-37.07	-21.23	65.01	37.07	0.000%
4	36.77	-65.01	-21.41	-36.77	65.01	21.41	0.000%
5	42.45	-65.01	-0.01	-42.45	65.01	0.01	0.000%
6	36.76	-65.01	21.40	-36.76	65.01	-21.40	0.000%
7	21.22	-65.01	37.07	-21.22	65.01	-37.07	0.000%
8	-0.01	-65.01	42.81	0.01	65.01	-42.81	0.000%
9	-21.23	-65.01	37.07	21.23	65.01	-37.07	0.000%
10	-36.77	-65.01	21.41	36.77	65.01	-21.41	0.000%
11	-42.45	-65.01	0.01	42.45	65.01	-0.01	0.000%
12	-36.76	-65.01	-21.40	36.76	65.01	21.40	0.000%
13	-21.22	-65.01	-37.07	21.22	65.01	37.07	0.000%
14	0.00	-80.78	0.00	-0.00	80.78	-0.00	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
15	0.00	-80.78	-7.88	-0.00	80.78	7.88	0.000%
16	3.91	-80.78	-6.82	-3.91	80.78	6.82	0.000%
17	6.77	-80.78	-3.94	-6.77	80.78	3.94	0.000%
18	7.82	-80.78	-0.00	-7.82	80.78	0.00	0.000%
19	6.77	-80.78	3.94	-6.77	80.78	-3.94	0.000%
20	3.91	-80.78	6.82	-3.91	80.78	-6.82	0.000%
21	-0.00	-80.78	7.88	0.00	80.78	-7.88	0.000%
22	-3.91	-80.78	6.82	3.91	80.78	-6.82	0.000%
23	-6.77	-80.78	3.94	6.77	80.78	-3.94	0.000%
24	-7.82	-80.78	0.00	7.82	80.78	-0.00	0.000%
25	-6.77	-80.78	-3.94	6.77	80.78	3.94	0.000%
26	-3.91	-80.78	-6.82	3.91	80.78	6.82	0.000%
27	0.00	-65.01	-11.86	-0.00	65.01	11.86	0.000%
28	5.88	-65.01	-10.27	-5.88	65.01	10.27	0.000%
29	10.19	-65.01	-5.93	-10.19	65.01	5.93	0.000%
30	11.76	-65.01	-0.00	-11.76	65.01	0.00	0.000%
31	10.18	-65.01	5.93	-10.18	65.01	-5.93	0.000%
32	5.88	-65.01	10.27	-5.88	65.01	-10.27	0.000%
33	-0.00	-65.01	11.86	0.00	65.01	-11.86	0.000%
34	-5.88	-65.01	10.27	5.88	65.01	-10.27	0.000%
35	-10.19	-65.01	5.93	10.19	65.01	-5.93	0.000%
36	-11.76	-65.01	0.00	11.76	65.01	-0.00	0.000%
37	-10.18	-65.01	-5.93	10.18	65.01	5.93	0.000%
38	-5.88	-65.01	-10.27	5.88	65.01	10.27	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00010154
3	Yes	5	0.00000001	0.00010827
4	Yes	5	0.00000001	0.00007605
5	Yes	5	0.00000001	0.00006258
6	Yes	5	0.00000001	0.00012645
7	Yes	5	0.00000001	0.00007987
8	Yes	4	0.00000001	0.00010863
9	Yes	5	0.00000001	0.00007870
10	Yes	5	0.00000001	0.00012819
11	Yes	5	0.00000001	0.00006240
12	Yes	5	0.00000001	0.00007595
13	Yes	5	0.00000001	0.00010536
14	Yes	4	0.00000001	0.00004811
15	Yes	4	0.00000001	0.00062358
16	Yes	4	0.00000001	0.00067094
17	Yes	4	0.00000001	0.00068680
18	Yes	4	0.00000001	0.00070340
19	Yes	4	0.00000001	0.00076866
20	Yes	4	0.00000001	0.00075851
21	Yes	4	0.00000001	0.00072302
22	Yes	4	0.00000001	0.00075710
23	Yes	4	0.00000001	0.00076707
24	Yes	4	0.00000001	0.00070000
25	Yes	4	0.00000001	0.00068284
26	Yes	4	0.00000001	0.00066720
27	Yes	4	0.00000001	0.00002491

28	Yes	4	0.00000001	0.00019573
29	Yes	4	0.00000001	0.00018260
30	Yes	4	0.00000001	0.00025140
31	Yes	4	0.00000001	0.00028397
32	Yes	4	0.00000001	0.00012376
33	Yes	4	0.00000001	0.00002358
34	Yes	4	0.00000001	0.00013124
35	Yes	4	0.00000001	0.00029204
36	Yes	4	0.00000001	0.00025102
37	Yes	4	0.00000001	0.00017503
38	Yes	4	0.00000001	0.00018230

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	175 - 154.87 (1)	TP29.45x24.21x0.1875	20.13	0.00	0.0	38.990	16.7565	-4.77	653.33	0.007
L2	154.87 - 116.29 (2)	TP38.99x27.9687x0.375	42.83	0.00	0.0	39.000	44.3014	-15.07	1727.76	0.009
L3	116.29 - 74.17 (3)	TP49.07x36.8453x0.5	47.54	0.00	0.0	39.000	74.3586	-27.17	2899.99	0.009
L4	74.17 - 33.34 (4)	TP58.58x46.3548x0.563	47.50	0.00	0.0	39.000	100.0730	-43.36	3902.85	0.011
L5	33.34 - 0 (5)	TP66x55.4388x0.625	41.17	0.00	0.0	39.000	129.6880	-64.99	5057.82	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	175 - 154.87 (1)	TP29.45x24.21x0.1875	93.87	9.664	38.990	0.248	0.00	0.000	38.990	0.000
L2	154.87 - 116.29 (2)	TP38.99x27.9687x0.375	872.71	25.795	39.000	0.661	0.00	0.000	39.000	0.000
L3	116.29 - 74.17 (3)	TP49.07x36.8453x0.5	2052.47	28.728	39.000	0.737	0.00	0.000	39.000	0.000
L4	74.17 - 33.34 (4)	TP58.58x46.3548x0.563	3430.13	29.829	39.000	0.765	0.00	0.000	39.000	0.000
L5	33.34 - 0 (5)	TP66x55.4388x0.625	5084.26	29.212	39.000	0.749	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	175 - 154.87 (1)	TP29.45x24.21x0.1875	12.67	0.756	26.000	0.058	0.14	0.007	26.000	0.000

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L2	154.87 - 116.29 (2)	TP38.99x27.9687x0.375	25.89	0.585	26.000	0.046	0.58	0.008	26.000	0.000
L3	116.29 - 74.17 (3)	TP49.07x36.8453x0.5	31.84	0.428	26.000	0.033	0.80	0.005	26.000	0.000
L4	74.17 - 33.34 (4)	TP58.58x46.3548x0.563	37.47	0.374	26.000	0.029	1.03	0.004	26.000	0.000
L5	33.34 - 0 (5)	TP66x55.4388x0.625	42.83	0.330	26.000	0.026	1.25	0.004	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 154.87 (1)	0.007	0.248	0.000	0.058	0.000	0.256 ✔	1.333	H1-3+VT ✔
L2	154.87 - 116.29 (2)	0.009	0.661	0.000	0.046	0.000	0.671 ✔	1.333	H1-3+VT ✔
L3	116.29 - 74.17 (3)	0.009	0.737	0.000	0.033	0.000	0.746 ✔	1.333	H1-3+VT ✔
L4	74.17 - 33.34 (4)	0.011	0.765	0.000	0.029	0.000	0.776 ✔	1.333	H1-3+VT ✔
L5	33.34 - 0 (5)	0.013	0.749	0.000	0.026	0.000	0.762 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	175 - 154.87	Pole	TP29.45x24.21x0.1875	1	-4.77	870.89	19.2	Pass
L2	154.87 - 116.29	Pole	TP38.99x27.9687x0.375	2	-15.07	2303.10	50.3	Pass
L3	116.29 - 74.17	Pole	TP49.07x36.8453x0.5	3	-27.17	3865.69	56.0	Pass
L4	74.17 - 33.34	Pole	TP58.58x46.3548x0.563	4	-43.36	5202.50	58.2	Pass
L5	33.34 - 0	Pole	TP66x55.4388x0.625	5	-64.99	6742.07	57.2	Pass
							Summary	
							Pole (L4) 58.2	Pass
							RATING =	**58.2** **Pass**

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#:	
Site Name:	*CT2198*
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	5084	ft-kips
Axial:	65	kips
Shear:	43	kips

Anchor Rod Data		
Qty:	32	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	75	in

Plate Data		
Diam:	81	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	6.55	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	66	in
Thick:	0.625	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension:	99.6 Kips	Rigid
Allowable Tension:	195.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	51.1% **Pass**	Fty*ASIF

Base Plate Results

Base Plate Stress:	41.8 ksi	Rigid
Allowable Plate Stress:	60.0 ksi	Service ASD
Base Plate Stress Ratio:	69.7% **Pass**	0.75*Fy*ASIF
		Y.L. Length: 35.62

Flexural Check

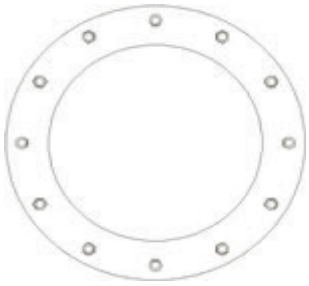
n/a

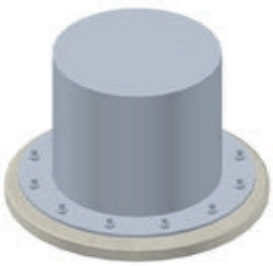
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Monopole Pier and Pad Foundation

BU # :
Site Name: CT2198
App. Number:
TIA-222 Revision: F

Design Reactions		
Shear, **S**:	43	kips
Moment, **M**:	5084	ft-kips
Tower Height, **H**:	175	ft
Tower Weight, **Wt**:	65	kips
Base Diameter, **BD**:	5.50	ft

Foundation Dimensions		
Depth, **D**:	4.5	ft
Pad Width, **W**:	34	ft
Neglected Depth, **N**:	3.3	ft
Thickness, **T**:	3.00	ft
Pier Diameter, **Pd**:	8.00	ft
Ext. Above Grade, **E**:	1.00	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.100	kcf
Ult. Bearing Capacity, Bc:	12.0	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.45	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	2	

Rebar Properties		
Pier Rebar Size, **Sp**:	9	
Pier Rebar Quanity, **mp**:	60	37
Pad Rebar Size, **Spad**:	9	
Pad Rebar Quanity, **mpad**:	36	16
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	5	6

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	8	7.5	**OK**
Overturning (ft-kips)	8043.33	5084.00	**63.2%**
Shear Capacity (kips)	175.25	43.00	**24.5%**
Bearing (ksf)	9.00	1.73	**19.2%**
Pad Shear - 1-way (kips)	1255.48	568.17	**45.3%**
Pad Shear - 2-way (kips)	2483.22	138.41	**5.6%**
Pad Moment Capacity (k-ft)	5128.51	2505.97	**48.9%**
Pier Moment Capacity (k-ft)	7223.43	5191.50	**71.9%**

PROJECT INFORMATION

SCOPE OF WORK:
- REMOVE (1) ANTENNA PER SECTOR (TOTAL OF 3 ANTENNAS)
- INSTALL (1) ANTENNA PER SECTOR (TOTAL OF 3 NEW ANTENNAS)
- ADD (1) RRH PER SECTOR (TOTAL OF 3 NEW RRHs)
- ADD (1) A-2 MODULE PER SECTOR (TOTAL OF 3 NEW A-2 MODULES)

SITE ADDRESS:	62-1 BOGGY HOLE RD OLD LYME, CT 06371
LATITUDE:	41.3223111 41° 19' 20.31"N
LONGITUDE:	-72.3070239 72° 18' 25.28"W
USID:	65083
TOWER OWNER:	TBD
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT
TOWER HEIGHT:	175-0"±
RAD CENTER:	145'-0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

at&t MOBILITY

FA CODE: 10035430
SITE NUMBER: CT2198
SITE NAME: OLD LYMEBOGGYHILL RD

PROJECT TEAM

CLIENT REPRESENTATIVE
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:
COMPANY: EMPIRE TELECOM
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EMAIL: dcooper@empiretelecomm.com

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CONTACT: DAVID COOPER
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ENGINEERING:
COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46, SUITE E39, MOUNTAIN LAKES, NJ 07046
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EMAIL: nbarile@comexconsultants.com

RF ENGINEER:
COMPANY: AT&T MOBILITY - NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD, SUITE 550 13 & 14, FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508-596-7146
EMAIL: cs6970@att.com

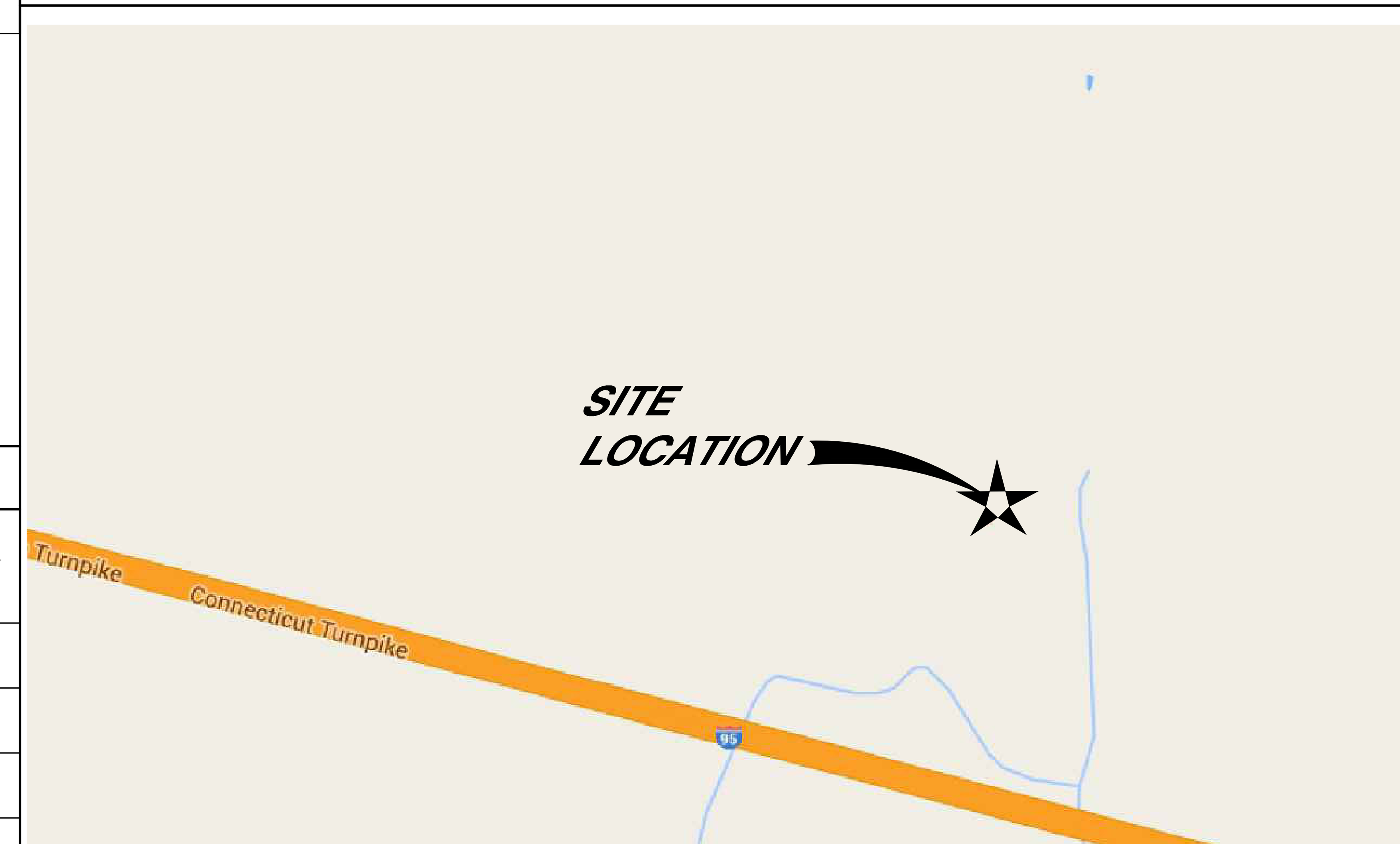
CONSTRUCTION MANAGEMENT:
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484-683-1750
EMAIL: gdorman@empiretelecomm.com

DRAWING INDEX

		REV.
T-1	TITLE SHEET	0
GN-1	GROUNDING & GENERAL NOTES	0
A-1	COMPOUND LAYOUTS	0
A-2	EQUIPMENT LAYOUTS	0
A-3	ANTENNA LAYOUTS & ELEVATIONS	0
A-4	DETAILS	0
A-5	ANTENNA MOUNTING DETAILS	0
G-1	GROUNDING DETAILS	0

VICINITY MAP

FROM ROCKY HILL, HEAD SOUTHWEST ON CONCRIB LN. TURN LEFT ONTO SOLO DR. TURN RIGHT ONTO GILBERT AVE. TURN RIGHT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 S. TAKE EXIT 22S TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN. USE THE LEFT 2 LANES TO MERGE ONTO 1-95 N. TAKE EXIT 71 FOR 4 MILE RIVER RD. TURN RIGHT ONTO 4 MILE RIVER RD. TURN LEFT TO MERGE ONTO 1-95 S TOWARD NEW HAVE. FOLLOW 2.6 MILES TO SITE ENTRANCE ON RIGHT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP - CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

COM-EX Consultants
115 ROUTE 46, SUITE E39, MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2198
SITE NAME:OLD LYMEBOGGYHILL RD
62-1 BOGGY HOLE RD.
OLD LYME, CT 06371
NEW LONDON COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/18/16	ISSUED AS FINAL	JW	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: JW | DRAWN BY: JW

SEAL: STATE OF CONNECTICUT, NICHOLAS D. BARILE, LICENSED PROFESSIONAL ENGINEER, CT ... 28643

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	T-1	0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. 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 DANGEROUS EXPOSURE LEVELS.
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.
23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY HUDSON DESIGN GROUP FOR A RECENT UPGRADE DATED 11/15/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2198
SITE NAME:OLD LYMEBOGGYHILL RD
62-1 BOGGY HOLE RD.
OLD LYME, CT 06371
NEW LONDON COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

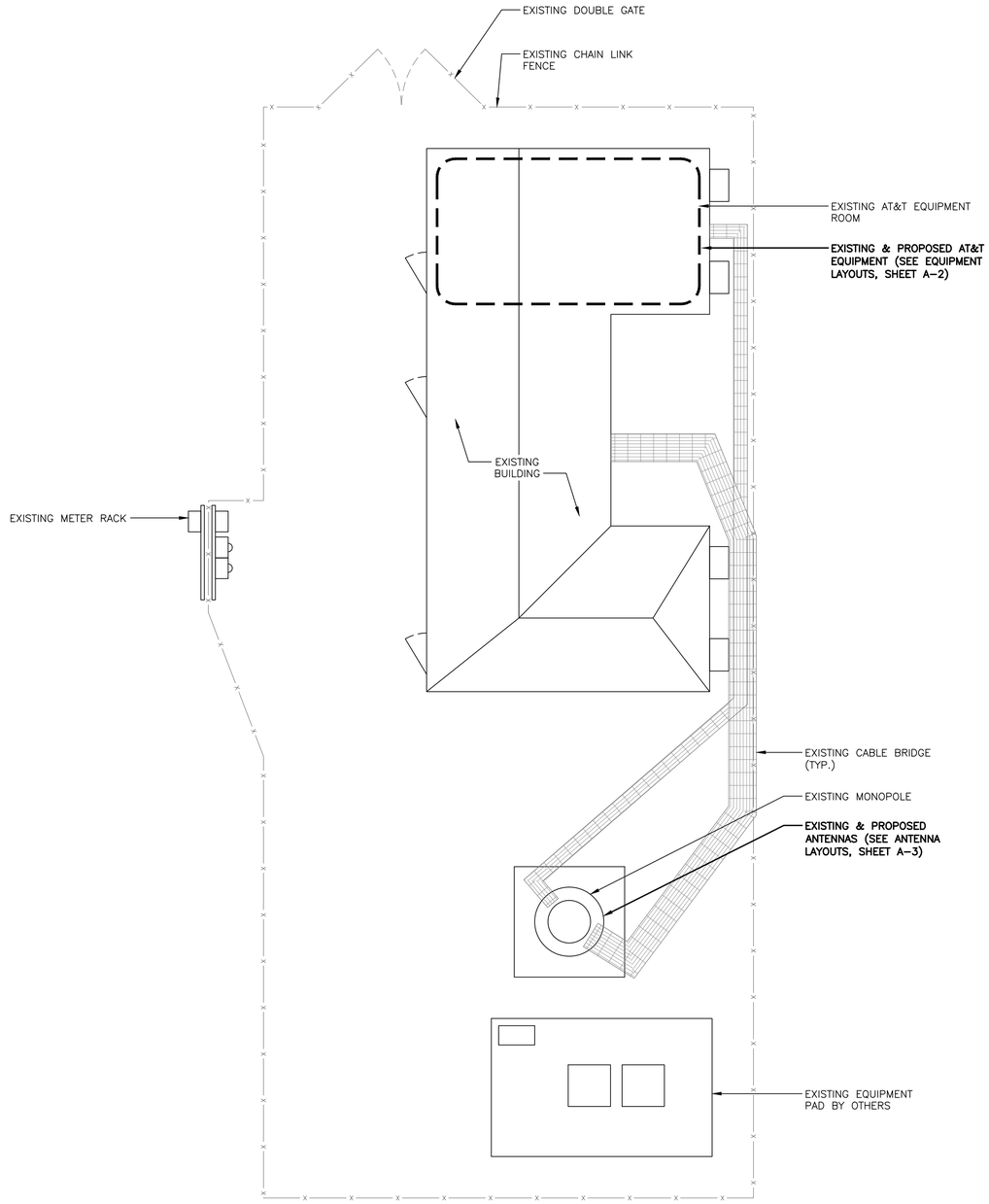
NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/18/16	ISSUED AS FINAL	JW	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: JW | DRAWN BY: JW

SEAL: STATE OF CONNECTICUT – NICHOLAS D. BARILE – No. 28643 – PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LIC. No. 28643

AT&T
DRAWING TITLE: GROUNDING NOTES & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	GN-1	0



NORTH

COMPOUND LAYOUT

SCALE: 3/16" = 1'-0"

0 2'-8" 5'-4" 10'-8"

GRAPHIC SCALE: 3/16"=1'-0"

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SCALE: AS SHOWN | DESIGNED BY: JW | DRAWN BY: JW

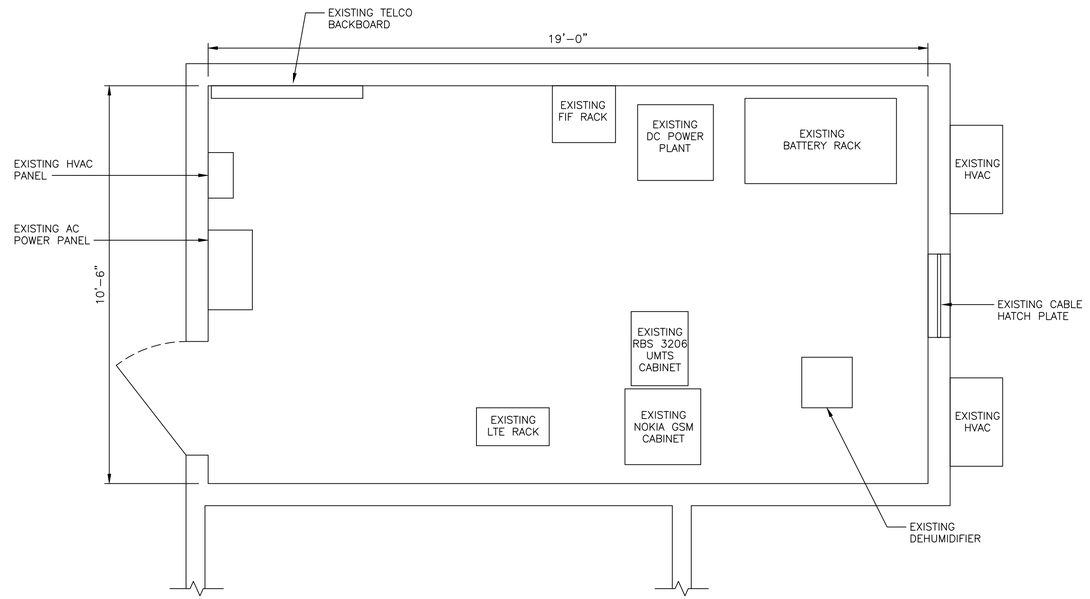
SEAL:

STATE OF CONNECTICUT
DOUGLAS B. BAKER
LICENSED PROFESSIONAL ENGINEER
PRINCIPAL ENGINEER
CT PROFESSIONAL ENGINEER 23643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	A-1	0



NORTH

EXISTING EQUIPMENT LAYOUT

SCALE: 1/2" = 2'-0"

0 1 2 4

GRAPHIC SCALE: 1/2"=1'-0"

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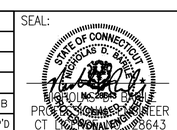
SEAL:



AT&T

DRAWING TITLE: EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
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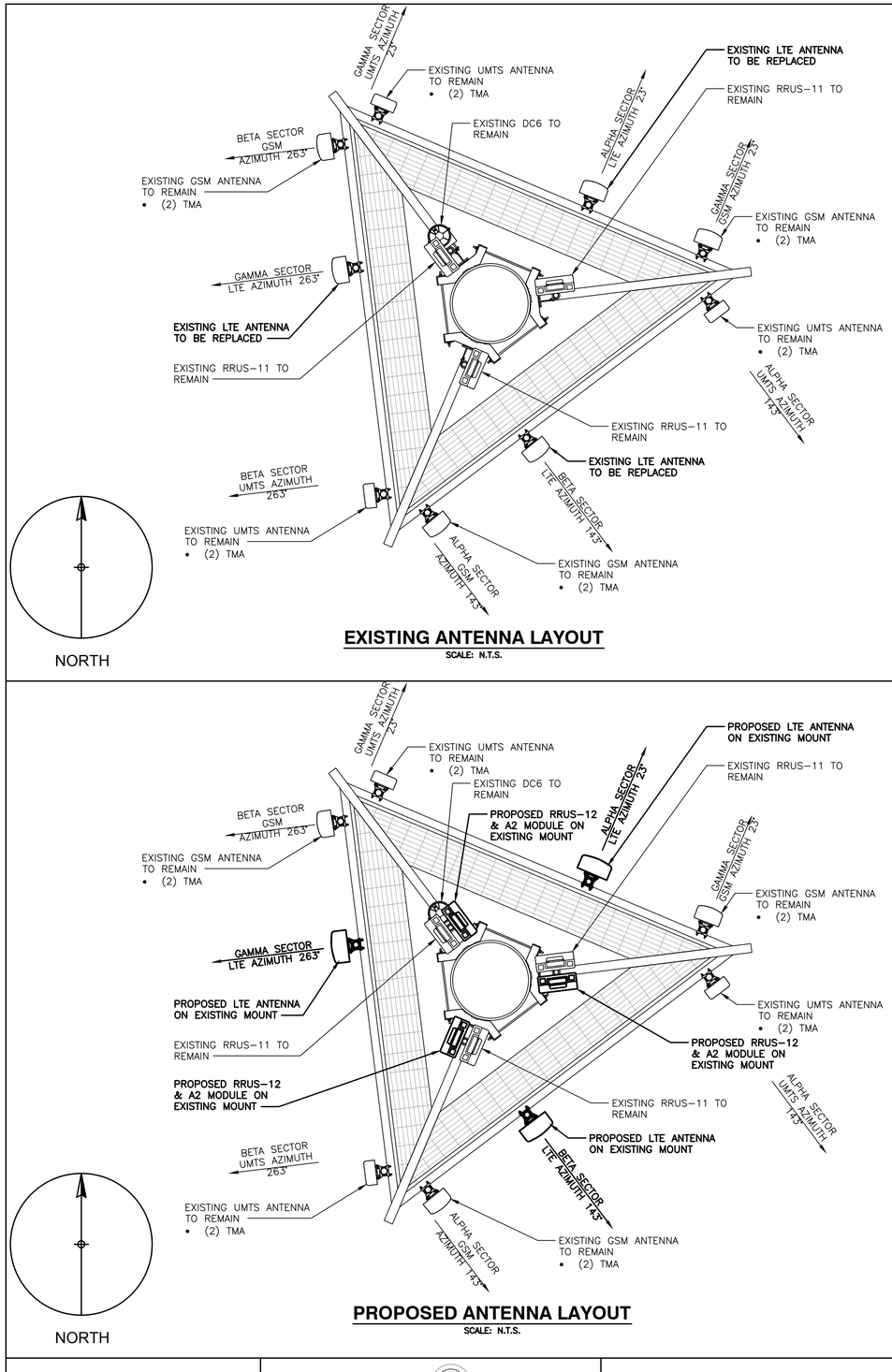
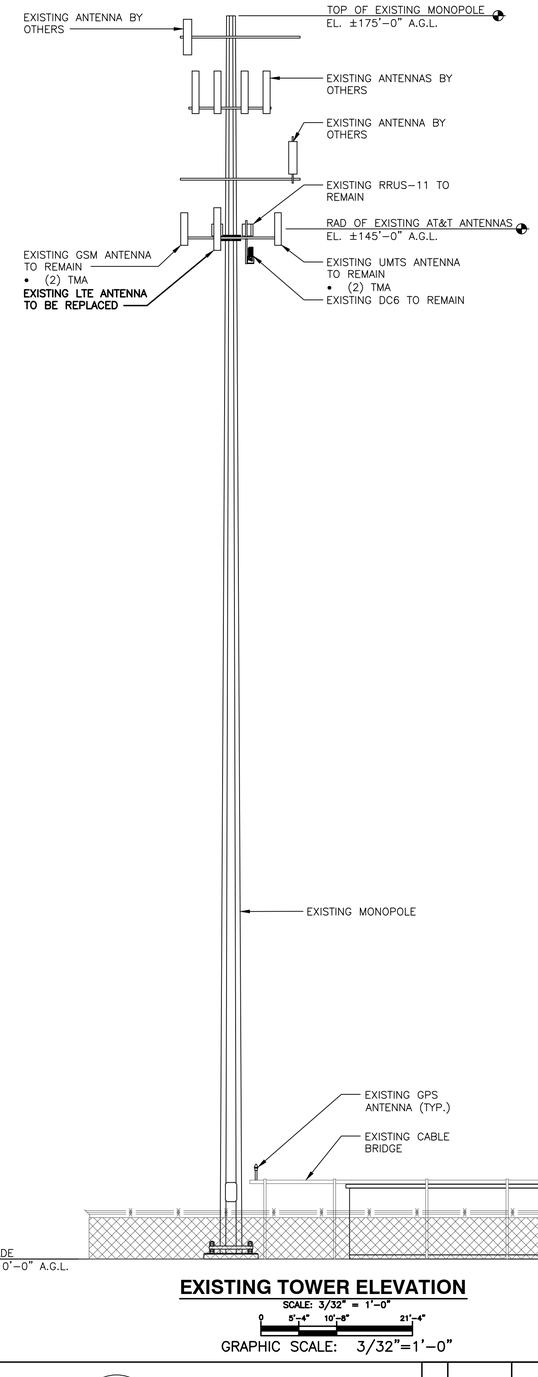


EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

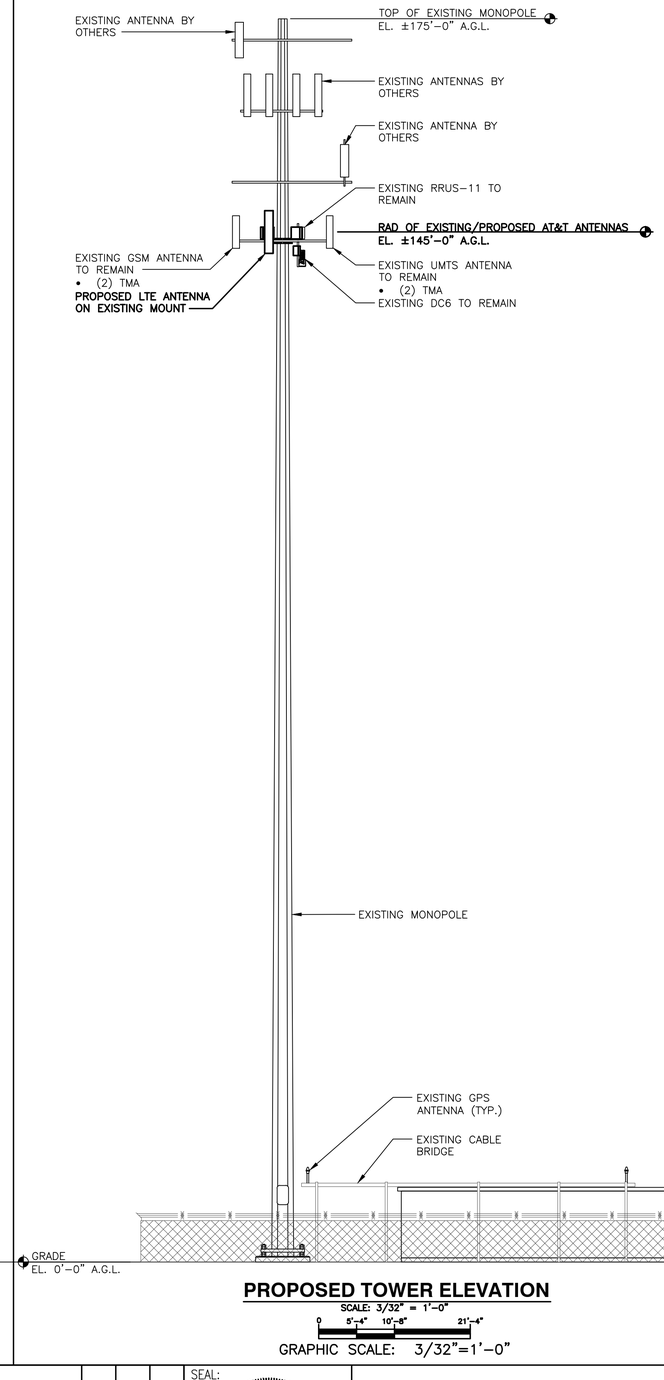


EXISTING TOWER ELEVATION

SCALE: 3/32" = 1'-0"

0 5'-4" 10'-8" 21'-4"

GRAPHIC SCALE: 3/32"=1'-0"



PROPOSED TOWER ELEVATION

SCALE: 3/32" = 1'-0"

0 5'-4" 10'-8" 21'-4"

GRAPHIC SCALE: 3/32"=1'-0"

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SCALE: AS SHOWN | DESIGNED BY: JW | DRAWN BY: JW

SEAL:

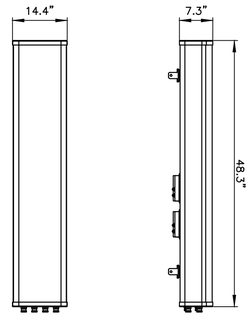
STATE OF CONNECTICUT — DOUGLAS D. BAKER — LICENSED PROFESSIONAL ENGINEER — 28643

PROFESSIONAL ENGINEER
CT

AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	A-3	0



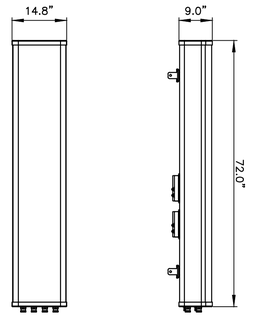
FRONT VIEW SIDE VIEW

BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H4
WEIGHT	32.3 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



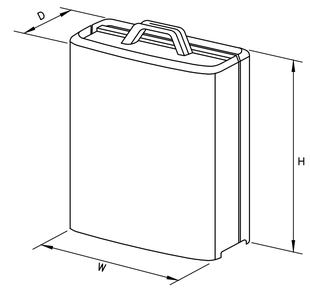
FRONT VIEW SIDE VIEW

BOTTOM VIEW

MANUFACTURER	CCI
MODEL	HPA-65R-BUU-H6
WEIGHT	42.9 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
* RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	19.69" x 16.97" x 7.17"	50.7 LBS

* DENOTES EXISTING

RRUS DETAIL

SCALE: N.T.S.

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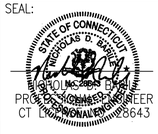
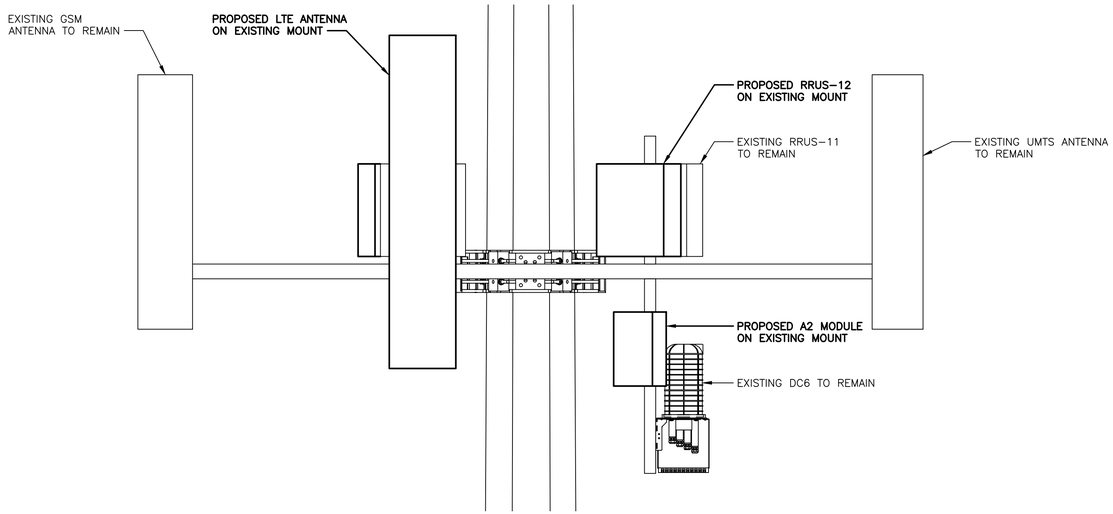


PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

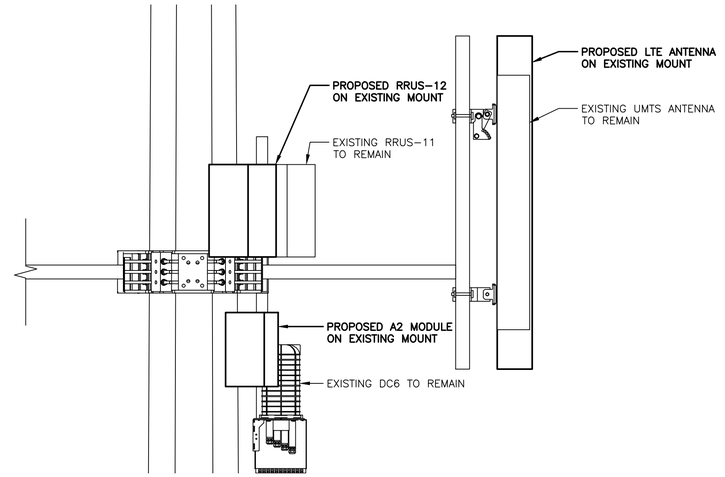
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	A-4	0



PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)

SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	KMW	AM-X-CD-14-65-00T-RET	48"x11.8"x5.9"
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	C1	POWERWAVE	7770	55"x11"x5"
	C2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	C3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	**CCI**	**HPA-65R-BUU-H4**	**48.3"x14.4"x7.3"**
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	**CCI**	**HPA-65R-BUU-H6**	**72"x14.8"x9"**
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	C1	POWERWAVE	7770	55"x11"x5"
	C2	**CCI**	**HPA-65R-BUU-H6**	**72"x14.8"x9"**
	C3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**
BETA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**
GAMMA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-12**	**19.7"x16.9"x7.2"**	**ERICSSON A2 MODULE**	**16.4"x15.2"x3.4"**

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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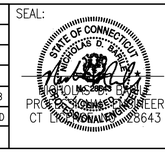
SEAL:

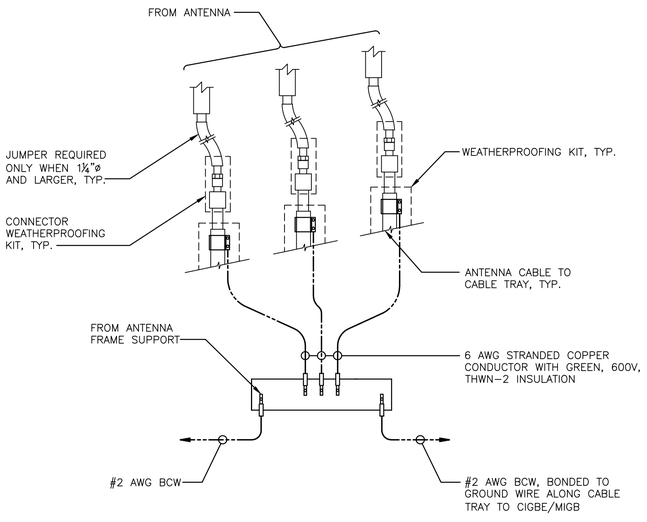


PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

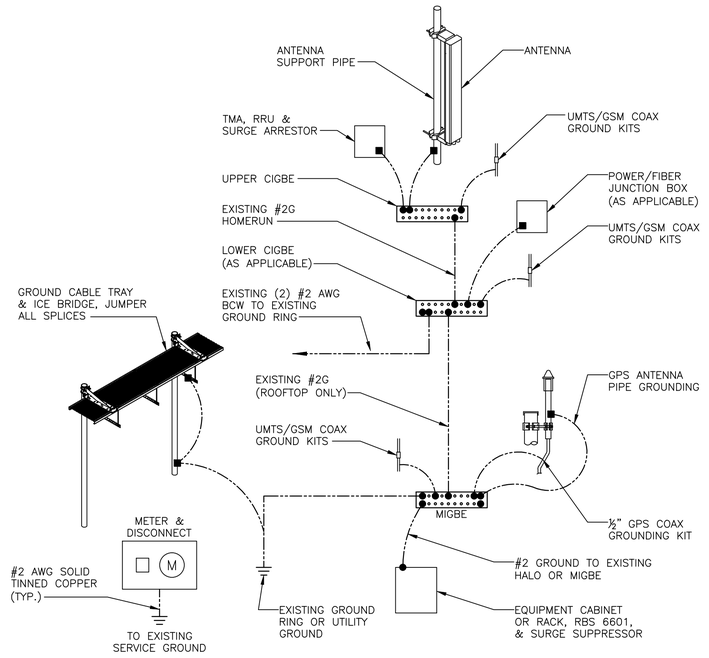
DRAWING TITLE:
ANTENNA MOUNTING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15134-EMP	A-5	0



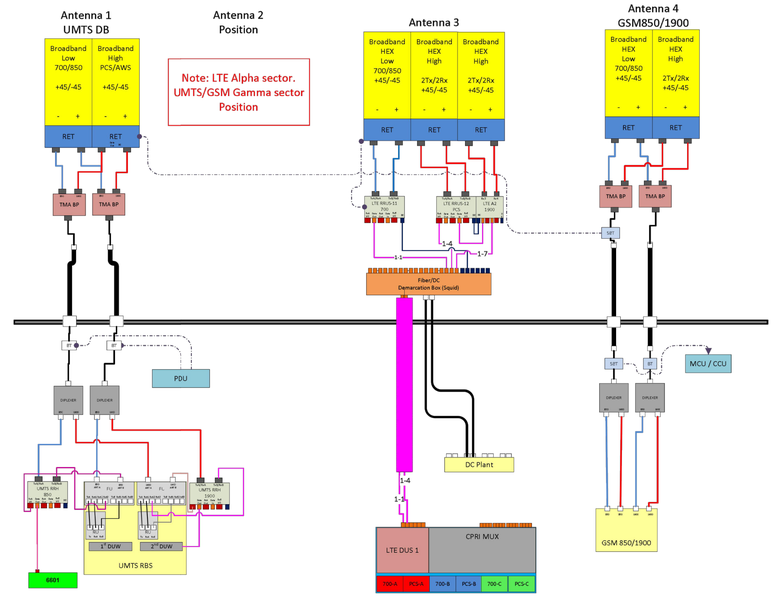
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



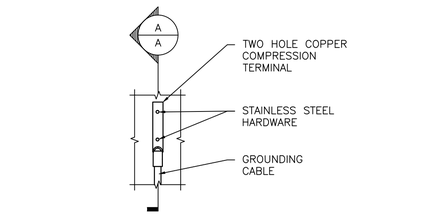
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

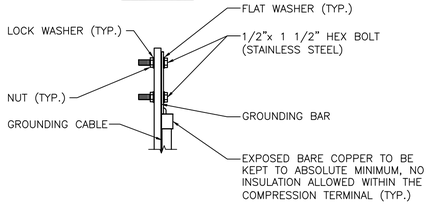


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



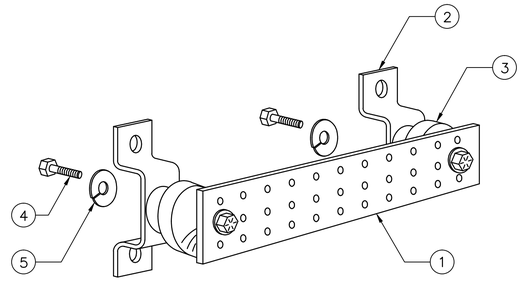
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL 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 SUPPLY 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)

GROUND BAR DETAIL

SCALE: N.T.S.

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SEAL:

PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:

GROUNDING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15134–EMP	G–1	0