Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 844-9813
MGentile@clinellc.com

January 22, 2016

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

RE: Notice of Exempt Modification // Site Number: CT1066
213 High Street, Portland, CT 06480 (Name: Portland)
N 41.580833333333// W -72.623888888889

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 77-foot level of the existing 80-foot self-support lattice tower at 213 High Street, Portland, CT 06480 (Please note, this address is also known as 97 High Street in the Portland, CT Assessor Database). The tower is owned by New Cingular Wireless PCS, LLC ("AT&T"). The property is also owned by AT&T. AT&T now intends to replace three (3) of its existing antennas with three (3) new LTE (700/1900 band) antennas for its LTE upgrade, as well as relocate three (3) others. These antennas would be installed at the 77-foot level of the tower. AT&T also intends to install three (3) remote radio units and three (3) remote radio unit modules as well as one (1) DC Surge Suppressor.

The current proposal involves an antenna swap only (three for three); no antennas will be added. Prior conditions do not pertain.

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 Susan Bransfield, First Selectwoman for the Town of Portland, as well as the property owner and tower owner, which are both AT&T in this case.

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 January 21, 2016 by ComEx Consultants, a structural analysis dated December 17, 2015 by B&T Group and an Emissions Analysis Report dated January 10, 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.

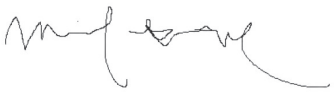
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

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 B&T Group, dated December 17, 2015.

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,



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Attachments

cc: Susan Bransfield, Town of Portland - as elected official
New Cingular Wireless PCS, LLC - as tower owner
New Cingular Wireless PCS, LLC - 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: CT1066

Portland
213 High Street
Portland, CT 06480

January 10, 2016

EBI Project Number: 6216000143

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general public allowable limit:	**11.58 %**

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January 10, 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: **CT1066 – Portland**

EBI Consulting was directed to analyze the proposed AT&T facility located at **213 High Street, Portland, 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 **213 High Street, Portland, 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) 2 GSM 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.

7) 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.

8) 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.

9) The antennas used in this modeling are the **Kathrein 800-10121, CCI HPA-65R-BUU-H6 and the KMW AM-X-CD-16-65-00T-RET** 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.

10) The antenna mounting height centerline of the proposed antennas is **75 feet** above ground level (AGL).

11) 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:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 14.45 dBd	Gain:	11.45 / 14.45 dBd	Gain:	11.45 / 14.45 dBd
Height (AGL):	75 feet	Height (AGL):	75 feet	Height (AGL):	75 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):	2,509.49	ERP (W):	2,509.49	ERP (W):	2,509.49
Antenna A1 MPE%	**2.38**	Antenna B1 MPE%	Kathrein 800-10121	Antenna C1 MPE%	Kathrein 800-10121
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	75 feet	Height (AGL):	75 feet	Height (AGL):	75 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):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	**5.75**	Antenna B2 MPE%	**5.75**	Antenna C2 MPE%	**5.75**
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 / 15.25 dBd	Gain:	13.85 / 15.25 dBd	Gain:	13.85 / 15.25 dBd
Height (AGL):	75 feet	Height (AGL):	75 feet	Height (AGL):	75 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):	3,465.76	ERP (W):	3,465.76	ERP (W):	3,465.76
Antenna A3 MPE%	**3.46**	Antenna B3 MPE%	**3.46**	Antenna C3 MPE%	**3.46**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**11.58 %**
No Additional Carriers	NA
Site Total MPE %:	**11.58 %**

AT&T Sector 1 Total:	2.28 %
AT&T Sector 2 Total:	2.64 %
AT&T Sector 3 Total:	2.10 %
Site Total:	11.58 %

AT&T _ Per Sector	# 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	418.91	75	6.33	850	567	1.12 %
AT&T 1900 MHz (PCS) UMTS	2	835.84	75	12.62	1900	1000	1.26 %
AT&T 850 MHz LTE	2	940.05	75	14.20	700	467	3.04 %
AT&T 1900 MHz (PCS) LTE	2	1791.23	75	27.05	1900	1000	2.71 %
AT&T 700 MHz GSM	2	727.98	75	10.99	850	567	1.94 %
AT&T 1900 MHz (PCS) GSM	2	1004.90	75	15.18	1900	1000	1.52 %
						Total:	11.58 %

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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:	11.58 %
Sector 2:	11.58 %
Sector 3 :	11.58 %
AT&T Maximum Total (per sector):	11.58 %
Site Total:	11.58 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.58%** 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

Centerline Communications
95 Ryan Drive, Suite 1
Raynham, MA 02767

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119

December 17, 2015

B+T No.: 103654.001.01

STRUCTURAL ANALYSIS
80' Self-Support Tower

AT&T DESIGNATION:	Site ID:	59359
	Site FA:	10035005
	Site Name:	Portland
	AT&T Project:	LTE MOD ADD_11-20-2015
ANALYSIS CRITERIA:	Codes:	TIA/EIA-222-F (85 mph fastest mile) IBC 2006 2005 Connecticut Building Code
SITE DATA:		213 High Street, Portland, CT, Middlesex County Latitude 41.580714°, Longitude -72.62386° Market MA/RI/VT/NH/ME/CT

Mr. Michael Gentile,

B+T Group is pleased to submit this Structural Analysis Report to determine the structural integrity of the aformentioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

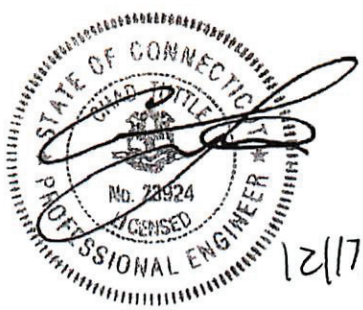
Tower Stress Level with Proposed Equipment:	**84.9%**	**Pass**
Foundation Ratio with Proposed Equipment:	**Unknown**	

We at B+T Group appreciate the opportunity of providing our continuing professional services to you and Centerline Communications. If you have any questions or need further assistance on this or any other project please give us a call.

Respectfully Submitted by: B+T Engineering, Inc.

Analysis Prepared by: Zach Smith

Analysis Reviewed by: Chad E. Tuttle, P.E.
COA: PEC.0001564
Exp: 2/10/2016



12/17/15

ANALYSIS RESULTS:

Table 1 - Section Capacity (Summary)

Component (Tower Section)	% Capacity	Pass / Fail
Leg (T5)	71.4	Pass
Diagonal (T5)	**84.9**	Pass
Horizontal (T1)	6.6	Pass
Secondary Horizontal (T5)	65.3	Pass
Top Girt (T4)	15.9	Pass
Bolt Checks	36.8	Pass

Table 2 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Anchor Rods	Base	36.7	**Pass**
1	Base Foundation	Base	--	**--**

Structure Rating (max from all components) =	84.9%

Notes:

1) The base foundation could not be analyzed as part of this analysis, as foundation and geotechnical information was not available. It is assumed that the foundation was designed with capacities similar to the tower itself and is therefore considered sufficient for the purposes of this analysis.

Recommendations:

N/A

ANALYSIS PROCEDURE:

Table 3 - Documents Provided

Document	Description	Date	Source
Tower Data	BTE Project 15085	4/26/2012	On File
Foundation Information	Information Not Available	N/A	N/A
Geotech Report	Information Not Available	N/A	N/A
Loading	B+T Project 84420.001; MOD LTE W3	6/14/2012	On File
	Equipment Modification Form; LTE MOD ADD_11-20-2015	11/24/2015	Siterra
Previous Structural Analysis	B+T Project 84420.001; MOD LTE W3	6/14/2012	On File

ANALYSIS METHOD:

tnxTower, a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix B.

ASSUMPTIONS:

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with the manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Appendix A of this report.
4. Mount areas and weights are assumed based on photographs provided.
5. Refer to the base level drawing for transmission line distribution.
6. All proposed loading was taken from the Equipment Modification Form.
7. All other existing/reserved loading was taken from the previous analysis unless otherwise noted.

If any of these assumptions have been made in error, B+T Group should be notified to determine the effect on the structural integrity of the tower.

APPENDIX A

TOWER ANALYSIS LOADING

TOWER ANALYSIS LOADING:

Existing / Reserved Loading

Antenna						Mount		Transmission Line	
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Manufacturer	Model	Quantity	Type	Quantity	Size (in)
AT&T	**77.5**	**77.5**	**6**	**Kathrein**	**800-10121**	**3**	**Ring w/ Sectored Frame**	**12**	**7/8"**
AT&T	**77.5**	**77.5**	**3***	**KMW**	**AMT-X-CD16-65-00T**			**2**	**3/4"**
AT&T	**77.5**	**77.5**	**6**	**ADC**	**CGI1900W850BP**			**1**	**1/2"**
AT&T	**77.5**	**77.5**	**6**	**CCI**	**DTMABP7819VG12A**				
AT&T	**77.5**	**77.5**	**3**	**Ericsson**	**RRUS-11**				
AT&T	**75.5**	**75.5**	**1**	**Raycap**	**DC6-48-60-18-F**				
Abandoned	**77.5**	**--**						**3**	**7/8"**
Abandoned	**77.5**	**--**						**3**	**1-5/8"**

*Equipment to be Removed

Proposed Loading

Antenna						Mount		Transmission Line	
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Manufacturer	Model	Quantity	Type	Quantity	Size (in)
AT&T	**77.5**	**77.5**	**3**	**CCI**	**HPA-65R-BUU-H6**				
AT&T	**77.5**	**77.5**	**3**	**Ericsson**	**RRUS-12**				
AT&T	**77.5**	**77.5**	**3**	**Ericsson**	**RRUS A2 Module**				

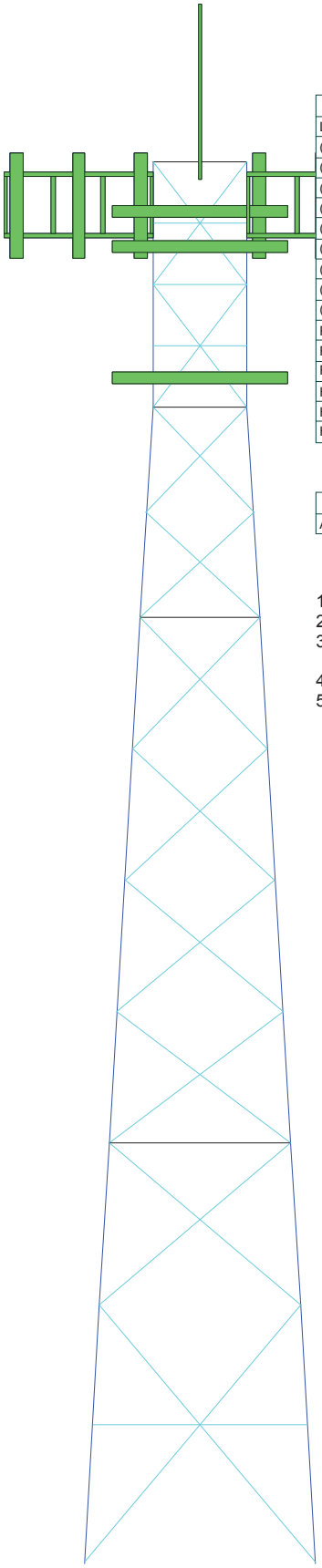
Note: See Base Level Drawing For Transmission Line Distribution

Future Loading

Antenna						Mount		Transmission Line	
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Manufacturer	Model	Quantity	Type	Quantity	Size (in)

APPENDIX B

CALCULATIONS



Section	T1	T2	T3	T4	T5
Legs	L4x4x3/8		L5x5x7/16		
Leg Grade			A36		
Diagonals				L2 1/2x2x3/16	L3x3x3/16
Diagonal Grade			A36		
Top Girts	L2x2x3/16	L3x3x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2x3/16	N.A.
Horizontals	L3 1/2x3 1/2x1/4	N.A.			
Sec. Horizontals	2L4x4x1/4x3/8	N.A.			L1 1/2x1 1/2x1/8
Face Width (ft)	5.375		6.79167	10.3333	11.4245
# Panels @ (ft)	4 @ 3.5	2 @ 6	4 @ 7.5	1 @ 9.25	1 @ 14.6667
Weight (K)	1.6	1.0	2.9	1.1	1.5

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 8' (E)	84	RRUS-12 (P)	77.5
(2) 800 10121 (E)	77.5	RRUS-12 (P)	77.5
(2) 800 10121 (E)	77.5	RRUS-12 (P)	77.5
(2) 800 10121 (E)	77.5	RRUS-A2 (P)	77.5
(2) CG1900W850BP (E)	77.5	RRUS-A2 (P)	77.5
(2) CG1900W850BP (E)	77.5	RRUS-A2 (P)	77.5
(2) CG1900W850BP (E)	77.5	Dual Ring Halo (E)	77.5
(2) DTMABP7819VG12A (E)	77.5	Sector Mount [SM 301-3] (E)	77.5
(2) DTMABP7819VG12A (E)	77.5	(3) 10' x 2" Mount Pipe (E-Per Photo)	77.5
(2) DTMABP7819VG12A (E)	77.5	(3) 10' x 2" Mount Pipe (E-Per Photo)	77.5
RRUS-11 (E)	77.5	(3) 10' x 2" Mount Pipe (E-Per Photo)	77.5
RRUS-11 (E)	77.5	DC6-48-60-18-8F (E)	75.5
RRUS-11 (E)	77.5	Dual Ring Halo (E)	75.5
HPA-65R-BUU-H6 (P)	77.5	Dual Ring Halo (E)	68
HPA-65R-BUU-H6 (P)	77.5	Cat walk (E)	51
HPA-65R-BUU-H6 (P)	77.5		

MATERIAL STRENGTH

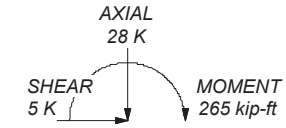
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

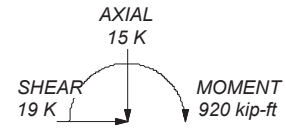
1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 84.9%

MAX. CORNER REACTIONS AT BASE:
DOWN: 53 K
SHEAR: 8 K

UPLIFT: -46 K
SHEAR: 7 K



TORQUE 4 kip-ft
38 mph WIND - 0.750 in ICE



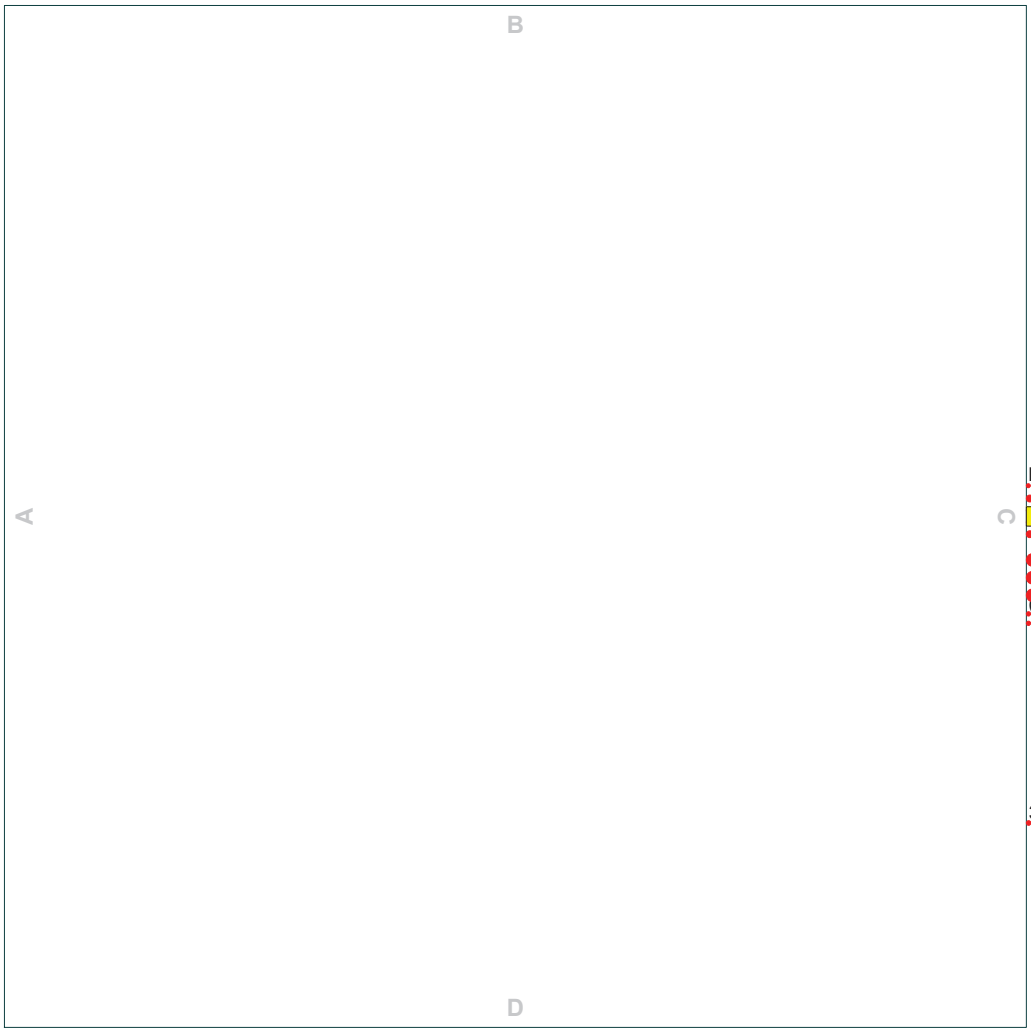
TORQUE 15 kip-ft
REACTIONS - 85 mph WIND

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 587-4630

Job:	***103654.001.01 - Portland, CT (USID# 59359)***		
Project:	***LTE MOD ADD_11-20-2015***		
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



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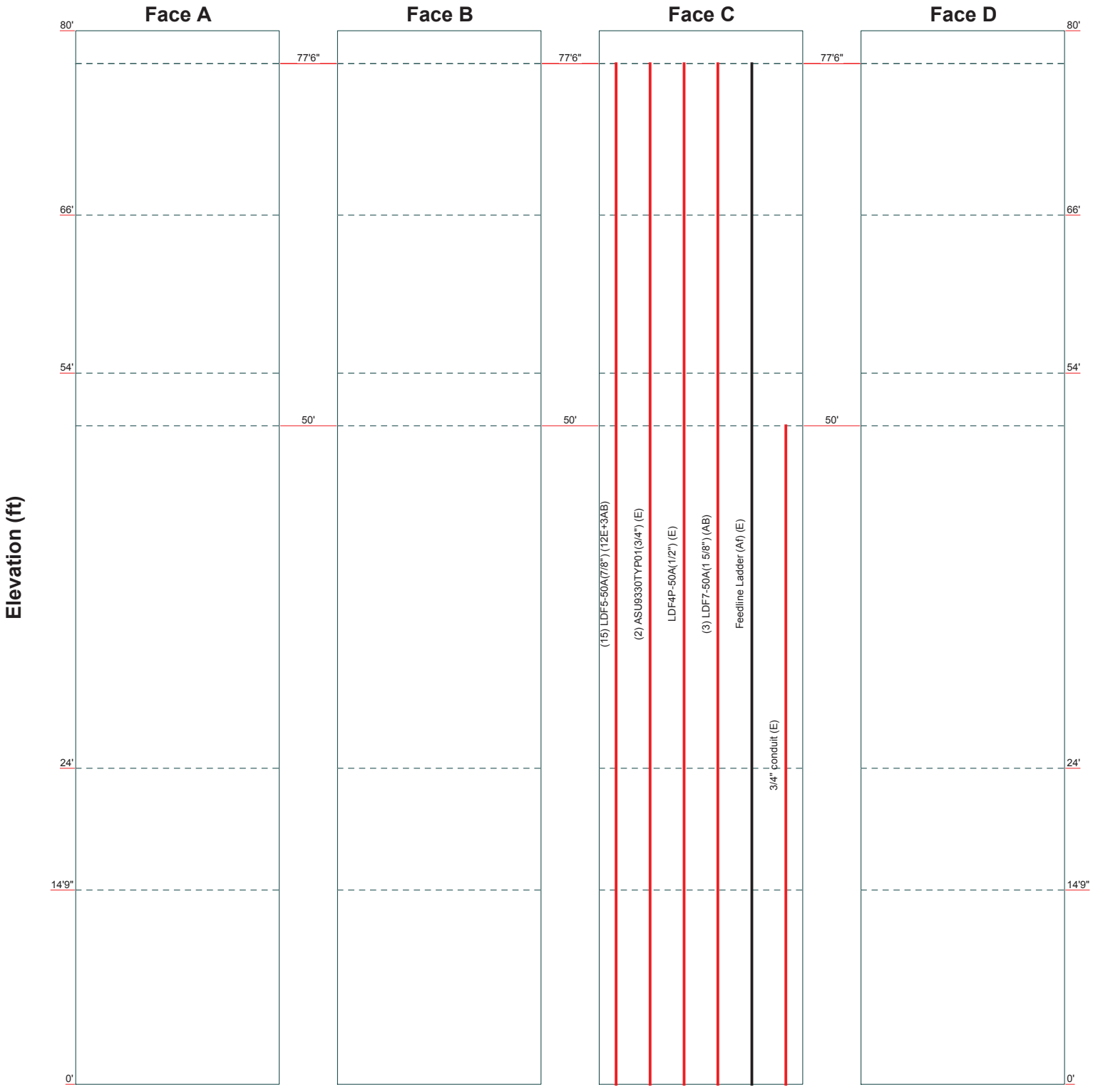
FAX: (918) 587-4630

Job:	***103654.001.01 - Portland, CT (USID# 59359)***		
Project:	***LTE MOD ADD_11-20-2015***		
Client: Centerline Communications		Drawn by: Shashank.S.Rao	App'd:
Code: TIA/EIA-222-F		Date: 12/17/15	Scale: NTS
Path:			Dwg No. E-7

Feed Line Distribution Chart
0' - 80'

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



B+T Group
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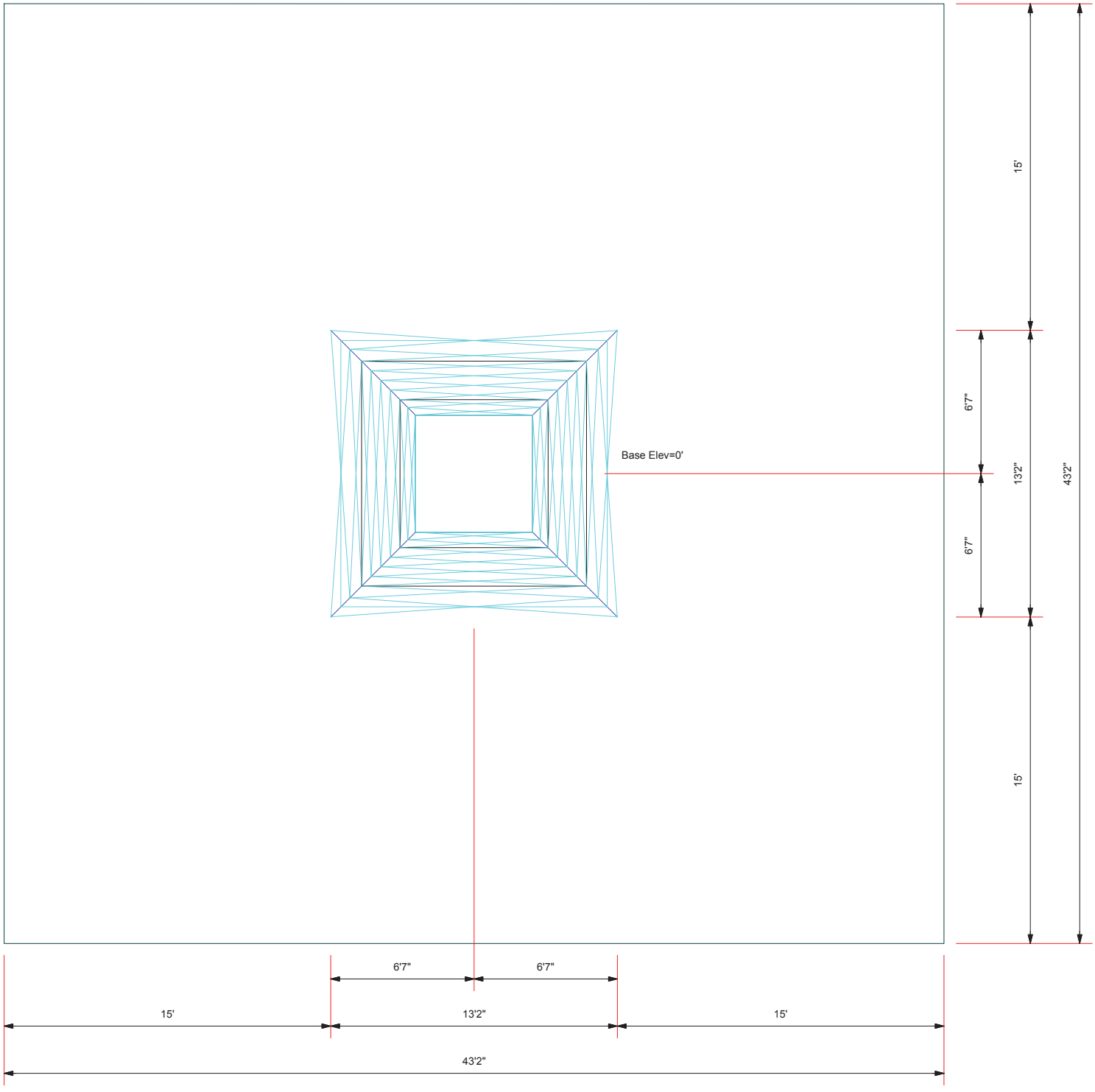
Job: *103654.001.01 - Portland, CT (USID# 59359)*			
Project: *LTE MOD ADD_11-20-2015*			
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-7	

Plot Plan

Total Area - 0.04 Acres



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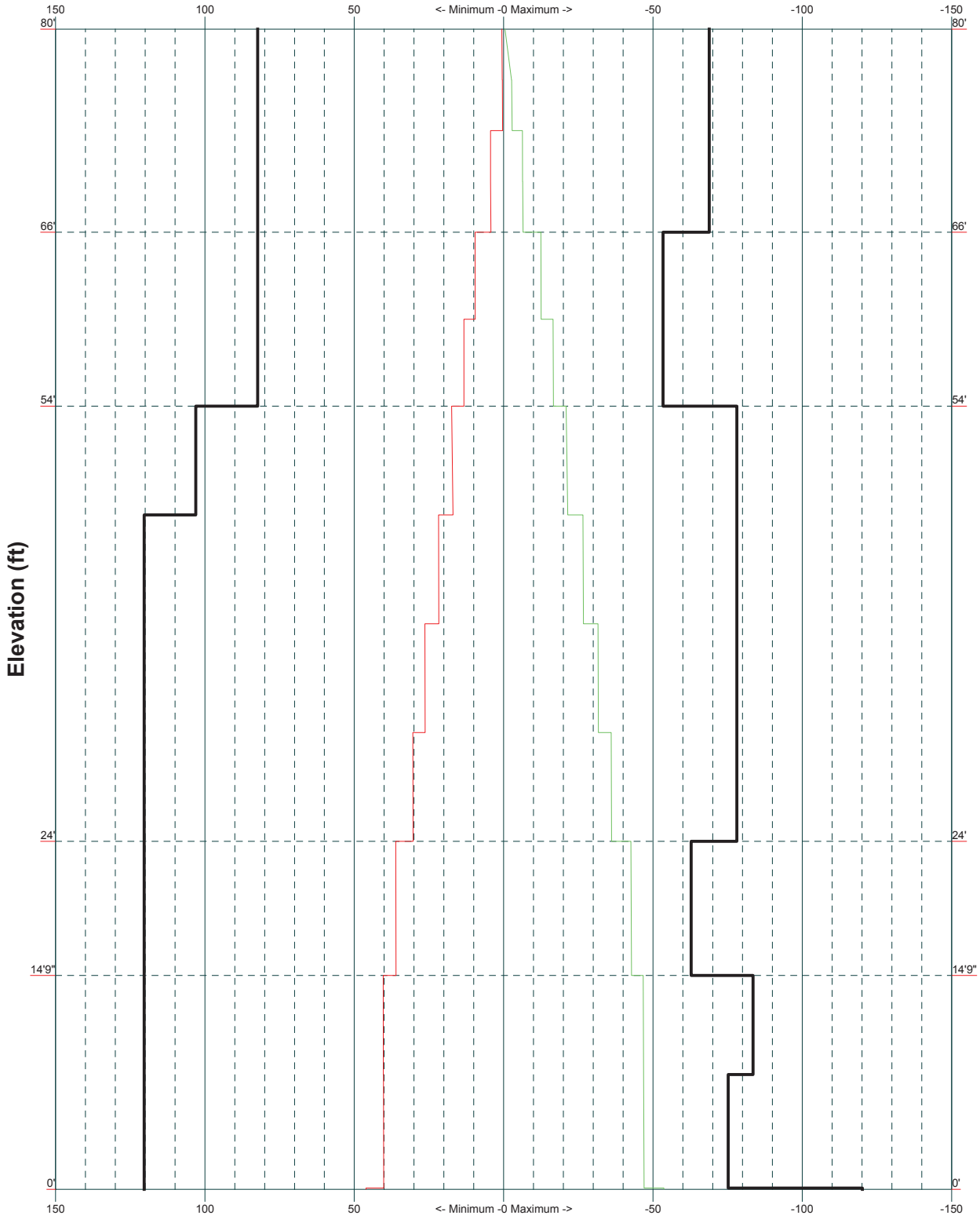
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-2	

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Leg Capacity ——— **Leg Compression (K)**



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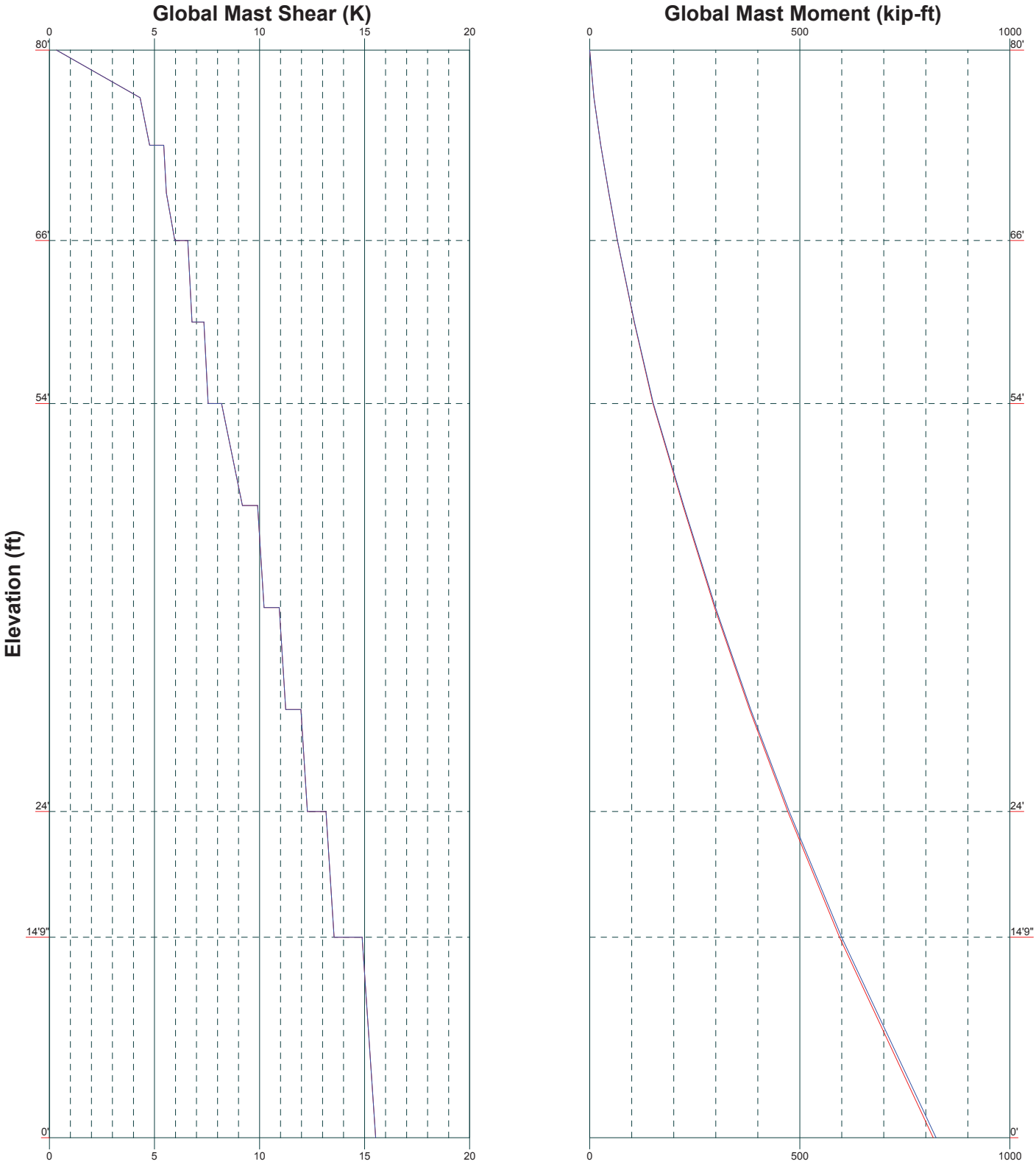
Job: 103654.001.01 - Portland, CT (USID# 59359)			
Project: LTE MOD ADD_11-20-2015			
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-3	

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Vx Vz

Maximum Values

Mx Mz



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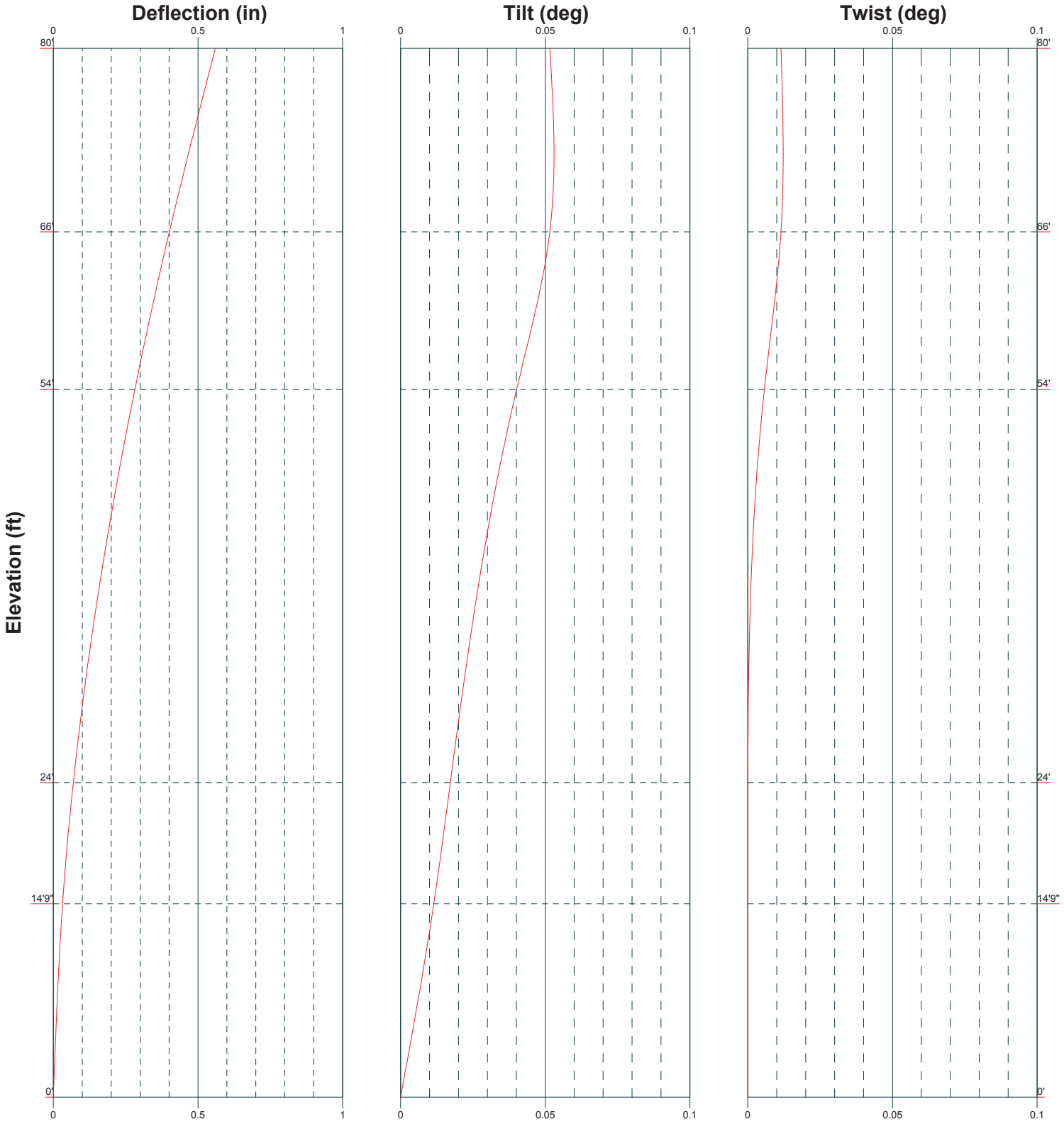
Job: 103654.001.01 - Portland, CT (USID# 59359)			
Project: LTE MOD ADD_11-20-2015			
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



B+T GRP

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Job: ***103654.001.01 - Portland, CT (USID# 59359)***			
Project: ***LTE MOD ADD_11-20-2015***			
Client: Centerline Communications	Drawn by: Shashank.S.Rao	App'd:	
Code: TIA/EIA-222-F	Date: 12/17/15	Scale: NTS	
Path:		Dwg No. E-5	

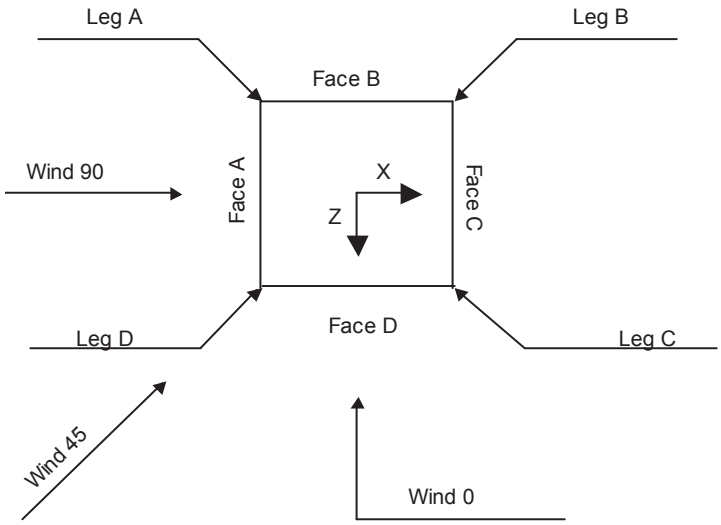
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 80' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 5'4-1/2" at the top and 13'2" at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in tower member 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		



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	80'-66'			5'4-1/2"	1	14'
T2	66'-54'			5'4-1/2"	1	12'
T3	54'-24'			6'9-1/2"	1	30'
T4	24'-14'9"			10'4"	1	9'3"
T5	14'9"-0'			11'5-3/32"	1	14'9"

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	80'-66'	3'6"	Double K	No	Yes	0.000	0.000
T2	66'-54'	6'	X Brace	No	No	0.000	0.000
T3	54'-24'	7'6"	X Brace	No	No	0.000	0.000
T4	24'-14'9"	9'3"	X Brace	No	No	0.000	0.000
T5	14'9"-0'	14'8"	X Brace	No	Yes	0.000	1.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 80'-66'	Single Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T2 66'-54'	Single Angle	L4x4x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T3 54'-24'	Single Angle	L5x5x7/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T4 24'-14'9"	Single Angle	L5x5x7/16	A36 (36 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T5 14'9"-0'	Single Angle	L5x5x7/16	A36 (36 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 80'-66'	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 66'-54'	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 54'-24'	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T4 24'-14'9"	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Flat Bar		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
T1 80'-66'	None	Flat Bar		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	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
T1 80'-66'	Double Angle	2L4x4x1/4x3/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T5 14'9"-0'	Single Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

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
T1 80'-66'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T2 66'-54'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T3 54'-24'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T4 24'-14'9"	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000
T5 14'9"-0'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000

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 80'-66'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 66'-54'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 54'-24'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 24'-14'9"	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 14'9"-0'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 80'-66'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 66'-54'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 54'-24'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 24'-14'9"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 14'9"-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	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 80'-66'	Sleeve DS	0.625 A325N	12	0.625 A325N	2	0.625 A325N	2	0.000 A325N	0	0.625 A325N	0	0.625 A325N	2	0.625 A325N	0
T2 66'-54'	Sleeve DS	0.625 A325N	12	0.625 A325N	2	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 54'-24'	Sleeve DS	0.625 A325N	12	0.625 A325N	2	0.625 A325N	2	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 24'-14'9"	Sleeve DS	0.625 A325N	0	0.625 A325N	2	0.625 A325N	2	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 14'9"-0'	Flange	1.250 A36	4	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 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 klf
LDF5-50A(7/8") (12E+3AB)	C	Yes	Ar (CfAe)	77'6" - 0'	0.000	0	15	4	0.750	1.090		0.000
ASU9330TYP01(3/4") (E)	C	Yes	Ar (CfAe)	77'6" - 0'	0.000	0.1	2	2	0.750	0.700		0.000
LDF4P-50A(1/2") (E)	C	Yes	Ar (CfAe)	77'6" - 0'	0.000	-0.03	1	1	0.500	0.630		0.000
LDF7-50A(1 5/8") (AB)	C	Yes	Ar (CfAe)	77'6" - 0'	0.000	0.06	3	3	0.750	1.980		0.001
Feedline Ladder (Af) (E) *&&* *&&*	C	Yes	Af (CfAe)	77'6" - 0'	0.000	0	1	1	3.000	3.000	12.000	0.008
3/4" conduit (E) *&&*	C	Yes	Ar (CfAe)	50' - 0'	0.000	0.3	1	1	0.750	0.750		0.003

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
&&							

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	80'-66'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	11.816	2.875	0.000	0.000	0.190
		D	0.000	0.000	0.000	0.000	0.000
T2	66'-54'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	12.330	3.000	0.000	0.000	0.199
		D	0.000	0.000	0.000	0.000	0.000
T3	54'-24'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	32.450	7.500	0.000	0.000	0.570
		D	0.000	0.000	0.000	0.000	0.000
T4	24'-14'9"	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	10.083	2.313	0.000	0.000	0.179
		D	0.000	0.000	0.000	0.000	0.000
T5	14'9"-0'	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	16.078	3.688	0.000	0.000	0.286
		D	0.000	0.000	0.000	0.000	0.000

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	80'-66'	A	0.825	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		10.541	15.841	0.000	0.000	0.606
		D		0.000	0.000	0.000	0.000	0.000
T2	66'-54'	A	0.806	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		10.846	16.504	0.000	0.000	0.625
		D		0.000	0.000	0.000	0.000	0.000
T3	54'-24'	A	0.765	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		31.245	41.126	0.000	0.000	1.630
		D		0.000	0.000	0.000	0.000	0.000
T4	24'-14'9"	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		9.751	12.665	0.000	0.000	0.503
		D		0.000	0.000	0.000	0.000	0.000
T5	14'9"-0'	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		15.549	20.195	0.000	0.000	0.802
		D		0.000	0.000	0.000	0.000	0.000

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	80'-66'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	2.793	2.573	4.712
		D	0.000	0.000	0.000	0.000
T2	66'-54'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	2.068	1.817	3.305
		D	0.000	0.000	0.000	0.000
T3	54'-24'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	3.666	3.249	5.988
		D	0.000	0.000	0.000	0.000
T4	24'-14'9"	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	1.117	1.158	2.130
		D	0.000	0.000	0.000	0.000
T5	14'9"-0'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	1.266	1.209	2.224
		D	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	80'-66'	3.981	0.236	2.307	0.066
T2	66'-54'	6.380	0.380	4.173	0.144
T3	54'-24'	8.699	0.715	6.760	0.647
T4	24'-14'9"	9.247	0.789	7.293	0.746
T5	14'9"-0'	12.117	1.036	9.880	1.011

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
Lighting Rod 5/8" x 8' (E)	C	None		0.000	84'	No Ice	0.500	0.500	0.031
						1/2" Ice	1.314	1.314	0.037
						1" Ice	2.144	2.144	0.047
						2" Ice	3.613	3.613	0.084
						4" Ice	5.683	5.683	0.227
&&									
(2) 800 10121 (E)	A	From Leg	4.000 0' 0'	0.000	77'6"	No Ice	5.448	3.285	0.046
						1/2" Ice	5.871	3.632	0.079
						1" Ice	6.304	3.985	0.117
						2" Ice	7.194	4.753	0.207

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	9.079	6.524	0.454
(2) 800 10121	B	From Leg	4.000	0.000	77'6"	No Ice	5.448	3.285	0.046
(E)			0'			1/2" Ice	5.871	3.632	0.079
			0'			1" Ice	6.304	3.985	0.117
						2" Ice	7.194	4.753	0.207
						4" Ice	9.079	6.524	0.454
(2) 800 10121	C	From Leg	4.000	0.000	77'6"	No Ice	5.448	3.285	0.046
(E)			0'			1/2" Ice	5.871	3.632	0.079
			0'			1" Ice	6.304	3.985	0.117
						2" Ice	7.194	4.753	0.207
						4" Ice	9.079	6.524	0.454
(2) CG1900W850BP	A	From Leg	4.000	0.000	77'6"	No Ice	1.285	0.313	0.012
(E)			0'			1/2" Ice	1.438	0.411	0.019
			0'			1" Ice	1.600	0.518	0.028
						2" Ice	1.950	0.757	0.053
						4" Ice	2.753	1.339	0.133
(2) CG1900W850BP	B	From Leg	4.000	0.000	77'6"	No Ice	1.285	0.313	0.012
(E)			0'			1/2" Ice	1.438	0.411	0.019
			0'			1" Ice	1.600	0.518	0.028
						2" Ice	1.950	0.757	0.053
						4" Ice	2.753	1.339	0.133
(2) CG1900W850BP	C	From Leg	4.000	0.000	77'6"	No Ice	1.285	0.313	0.012
(E)			0'			1/2" Ice	1.438	0.411	0.019
			0'			1" Ice	1.600	0.518	0.028
						2" Ice	1.950	0.757	0.053
						4" Ice	2.753	1.339	0.133
(2) DTMABP7819VG12A	A	From Leg	4.000	0.000	77'6"	No Ice	1.139	0.391	0.019
(E)			0'			1/2" Ice	1.284	0.488	0.026
			0'			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
(2) DTMABP7819VG12A	B	From Leg	4.000	0.000	77'6"	No Ice	1.139	0.391	0.019
(E)			0'			1/2" Ice	1.284	0.488	0.026
			0'			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
(2) DTMABP7819VG12A	C	From Leg	4.000	0.000	77'6"	No Ice	1.139	0.391	0.019
(E)			0'			1/2" Ice	1.284	0.488	0.026
			0'			1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
RRUS-11	A	From Leg	4.000	0.000	77'6"	No Ice	3.249	1.373	0.048
(E)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	B	From Leg	4.000	0.000	77'6"	No Ice	3.249	1.373	0.048
(E)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
RRUS-11	C	From Leg	4.000	0.000	77'6"	No Ice	3.249	1.373	0.048
(E)			0'			1/2" Ice	3.491	1.551	0.068
			0'			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
DC6-48-60-18-8F	A	From Leg	4.000	0.000	75'6"	No Ice	1.467	1.467	0.019

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
(E)			0' 0'			1/2" Ice 1" Ice 2" Ice 4" Ice	1.667 1.878 2.333 3.378	1.667 1.878 2.333 3.378	0.037 0.057 0.105 0.239
HPA-65R-BUU-H6 (P)	A	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.360 10.927 11.502 12.680 15.137	6.450 6.913 7.384 8.469 10.777	0.051 0.114 0.183 0.342 0.745
HPA-65R-BUU-H6 (P)	B	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.360 10.927 11.502 12.680 15.137	6.450 6.913 7.384 8.469 10.777	0.051 0.114 0.183 0.342 0.745
HPA-65R-BUU-H6 (P)	C	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.360 10.927 11.502 12.680 15.137	6.450 6.913 7.384 8.469 10.777	0.051 0.114 0.183 0.342 0.745
RRUS-12 (P)	A	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.669 3.926 4.191 4.747 5.963	1.488 1.673 1.866 2.280 3.211	0.058 0.081 0.108 0.171 0.344
RRUS-12 (P)	B	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.669 3.926 4.191 4.747 5.963	1.488 1.673 1.866 2.280 3.211	0.058 0.081 0.108 0.171 0.344
RRUS-12 (P)	C	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.669 3.926 4.191 4.747 5.963	1.488 1.673 1.866 2.280 3.211	0.058 0.081 0.108 0.171 0.344
RRUS-A2 (P)	A	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.392 2.600 2.816 3.275 4.296	0.542 0.675 0.816 1.125 1.845	0.022 0.035 0.050 0.088 0.202
RRUS-A2 (P)	B	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.392 2.600 2.816 3.275 4.296	0.542 0.675 0.816 1.125 1.845	0.022 0.035 0.050 0.088 0.202
RRUS-A2 (P)	C	From Leg	4.000 0' 0'	0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.392 2.600 2.816 3.275 4.296	0.542 0.675 0.816 1.125 1.845	0.022 0.035 0.050 0.088 0.202
Dual Ring Halo (E)	C	None		0.000	77'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.500 11.100 11.700 12.900 15.300	10.500 11.100 11.700 12.900 15.300	0.298 0.326 0.353 0.408 0.518
Sector Mount [SM 301-3] (E)	C	None		0.000	77'6"	No Ice 1/2" Ice 1" Ice	29.610 39.800 49.990	29.610 39.800 49.990	1.302 1.843 2.383

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
						2" Ice	70.370	70.370	3.465
						4" Ice	111.130	111.130	5.628
(3) 10' x 2" Mount Pipe	A	From Leg	4.000	0.000	77'6"	No Ice	2.000	2.000	0.080
(E-Per Photo)			0'			1/2" Ice	3.025	3.025	0.096
			3'			1" Ice	4.067	4.067	0.117
						2" Ice	5.702	5.702	0.181
						4" Ice	8.257	8.257	0.394
(3) 10' x 2" Mount Pipe	B	From Leg	4.000	0.000	77'6"	No Ice	2.000	2.000	0.080
(E-Per Photo)			0'			1/2" Ice	3.025	3.025	0.096
			3'			1" Ice	4.067	4.067	0.117
						2" Ice	5.702	5.702	0.181
						4" Ice	8.257	8.257	0.394
(3) 10' x 2" Mount Pipe	C	From Leg	4.000	0.000	77'6"	No Ice	2.000	2.000	0.080
(E-Per Photo)			0'			1/2" Ice	3.025	3.025	0.096
			3'			1" Ice	4.067	4.067	0.117
						2" Ice	5.702	5.702	0.181
						4" Ice	8.257	8.257	0.394
&&									
Dual Ring Halo	C	None		0.000	75'6"	No Ice	10.500	10.500	0.298
(E)						1/2" Ice	11.100	11.100	0.326
						1" Ice	11.700	11.700	0.353
						2" Ice	12.900	12.900	0.408
						4" Ice	15.300	15.300	0.518
Dual Ring Halo	C	None		0.000	68'	No Ice	10.500	10.500	0.298
(E)						1/2" Ice	11.100	11.100	0.326
						1" Ice	11.700	11.700	0.353
						2" Ice	12.900	12.900	0.408
						4" Ice	15.300	15.300	0.518
&&									
Cat walk	B	From Leg	0.000	0.000	51'	No Ice	27.500	27.500	1.587
(E)			0'			1/2" Ice	39.500	39.500	2.182
			0'			1" Ice	51.500	51.500	2.777
						2" Ice	75.500	75.500	3.967
						4" Ice	123.500	123.500	6.347
&&									

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 45 deg - No Ice
4	Dead+Wind 90 deg - No Ice
5	Dead+Wind 135 deg - No Ice
6	Dead+Wind 180 deg - No Ice
7	Dead+Wind 225 deg - No Ice
8	Dead+Wind 270 deg - No Ice
9	Dead+Wind 315 deg - No Ice
10	Dead+Ice+Temp
11	Dead+Wind 0 deg+Ice+Temp

Comb. No.	Description
12	Dead+Wind 45 deg+Ice+Temp
13	Dead+Wind 90 deg+Ice+Temp
14	Dead+Wind 135 deg+Ice+Temp
15	Dead+Wind 180 deg+Ice+Temp
16	Dead+Wind 225 deg+Ice+Temp
17	Dead+Wind 270 deg+Ice+Temp
18	Dead+Wind 315 deg+Ice+Temp
19	Dead+Wind 0 deg - Service
20	Dead+Wind 45 deg - Service
21	Dead+Wind 90 deg - Service
22	Dead+Wind 135 deg - Service
23	Dead+Wind 180 deg - Service
24	Dead+Wind 225 deg - Service
25	Dead+Wind 270 deg - Service
26	Dead+Wind 315 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	80 - 66	Leg	Max Tension	3	4.395	-0.039	-0.041
			Max. Compression	3	-6.496	-0.053	-0.052
			Max. Mx	6	-0.893	-0.591	-0.019
			Max. My	6	-1.318	-0.018	0.589
			Max. Vy	2	0.920	-0.326	0.016
			Max. Vx	2	-0.922	0.011	0.331
		Diagonal	Max Tension	5	2.504	0.000	0.000
			Max. Compression	5	-2.963	0.000	0.000
			Max. Mx	10	-0.235	-0.010	0.000
			Max. Vy	10	0.009	0.000	0.000
		Horizontal	Max Tension	4	1.134	0.008	0.000
			Max. Compression	8	-1.134	0.000	0.000
			Max. Mx	13	-0.091	0.015	0.000
			Max. My	4	-0.210	0.008	0.000
			Max. Vy	13	0.021	0.015	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Secondary Horizontal	Max Tension	4	0.586	0.000	0.000
			Max. Compression	8	-0.411	0.000	0.000
			Max. Mx	10	0.191	0.084	0.000
			Max. Vy	10	-0.063	0.000	0.000
		Top Girt	Max Tension	13	0.106	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	10	0.039	-0.022	0.000
			Max. Vy	10	0.017	0.000	0.000
T2	66 - 54	Leg	Max Tension	5	13.297	-0.007	-0.009
			Max. Compression	5	-16.666	-0.060	-0.174
			Max. Mx	5	13.268	0.183	0.075
			Max. My	9	13.116	0.077	0.184
			Max. Vy	5	-0.061	0.183	0.075
			Max. Vx	9	-0.062	0.077	0.184
		Diagonal	Max Tension	6	2.084	0.000	0.000
			Max. Compression	6	-2.141	0.000	0.000
			Max. Mx	5	1.697	0.025	-0.003
			Max. My	2	-2.065	-0.002	-0.005
			Max. Vy	12	-0.015	0.021	0.004
			Max. Vx	13	-0.002	0.000	0.000
		Top Girt	Max Tension	2	0.112	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-0.046	0.000	0.000
			Max. Mx	10	0.034	-0.031	0.000
			Max. My	10	0.034	0.000	0.002
			Max. Vy	10	-0.023	0.000	0.000
			Max. Vx	10	-0.001	0.000	0.000
T3	54 - 24	Leg	Max Tension	5	30.370	0.031	-0.014
			Max. Compression	5	-36.159	-0.173	-0.194
			Max. Mx	5	-3.553	0.467	-0.361
			Max. My	9	-3.596	-0.358	0.465
			Max. Vy	5	-0.221	0.467	-0.361
			Max. Vx	9	-0.221	-0.358	0.465
		Diagonal	Max Tension	6	2.658	0.000	0.000
			Max. Compression	6	-2.709	0.000	0.000
			Max. Mx	12	0.407	0.029	0.008
			Max. My	13	0.495	0.026	0.008
			Max. Vy	13	0.021	0.028	0.008
			Max. Vx	13	-0.002	0.000	0.000
		Top Girt	Max Tension	6	0.214	0.000	0.000
			Max. Compression	6	-0.207	0.000	0.000
			Max. Mx	10	0.037	-0.041	0.000
			Max. My	10	0.037	0.000	0.002
			Max. Vy	10	-0.024	0.000	0.000
			Max. Vx	10	0.001	0.000	0.000
T4	24 - 14.75	Leg	Max Tension	5	36.092	0.164	0.159
			Max. Compression	5	-42.814	0.091	0.001
			Max. Mx	5	-4.433	0.835	-0.774
			Max. My	9	-4.433	-0.777	0.839
			Max. Vy	5	-0.174	0.835	-0.774
			Max. Vx	9	-0.174	-0.777	0.839
		Diagonal	Max Tension	9	3.391	0.000	0.000
			Max. Compression	9	-3.078	0.000	0.000
			Max. Mx	12	-0.518	0.057	-0.009
			Max. My	2	-2.626	0.003	-0.022
			Max. Vy	12	0.031	0.057	-0.009
			Max. Vx	13	-0.004	0.000	0.000
		Top Girt	Max Tension	13	0.651	0.000	0.000
			Max. Compression	4	-0.577	0.000	0.000
			Max. Mx	10	0.502	-0.085	0.000
			Max. My	10	0.502	0.000	0.005
			Max. Vy	10	0.033	0.000	0.000
			Max. Vx	10	-0.002	0.000	0.000
T5	14.75 - 0	Leg	Max Tension	5	46.066	-0.219	-0.178
			Max. Compression	5	-53.687	-0.000	0.000
			Max. Mx	5	-4.082	0.835	-0.774
			Max. My	9	-4.082	-0.777	0.839
			Max. Vy	9	2.895	0.000	-0.000
			Max. Vx	5	2.886	-0.000	0.000
		Diagonal	Max Tension	9	4.170	0.000	0.000
			Max. Compression	9	-4.609	0.000	0.000
			Max. Mx	5	1.998	0.061	-0.015
			Max. My	13	1.377	0.060	0.025
			Max. Vy	13	0.033	0.060	0.025
			Max. Vx	13	-0.005	0.000	0.000
		Secondary Horizontal	Max Tension	5	0.816	0.000	0.000
			Max. Compression	5	-0.816	0.000	0.000
			Max. Mx	10	0.139	-0.073	0.000
			Max. My	10	0.139	0.000	0.004
			Max. Vy	10	0.024	0.000	0.000
			Max. Vx	10	-0.001	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg D	Max. Vert	7	50.006	5.641	-5.361
	Max. H_x	7	50.006	5.641	-5.361
	Max. H_z	3	-44.225	-5.048	4.813
	Min. Vert	3	-44.225	-5.048	4.813
	Min. H_x	3	-44.225	-5.048	4.813
	Min. H_z	7	50.006	5.641	-5.361
Leg C	Max. Vert	5	53.198	-5.405	-6.037
	Max. H_x	9	-45.105	4.813	5.295
	Max. H_z	9	-45.105	4.813	5.295
	Min. Vert	9	-45.105	4.813	5.295
	Min. H_x	5	53.198	-5.405	-6.037
	Min. H_z	5	53.198	-5.405	-6.037
Leg B	Max. Vert	3	51.797	-5.436	5.715
	Max. H_x	7	-42.434	4.738	-4.973
	Max. H_z	3	51.797	-5.436	5.715
	Min. Vert	7	-42.434	4.738	-4.973
	Min. H_x	3	51.797	-5.436	5.715
	Min. H_z	7	-42.434	4.738	-4.973
Leg A	Max. Vert	9	52.677	6.015	5.383
	Max. H_x	9	52.677	6.015	5.383
	Max. H_z	9	52.677	6.015	5.383
	Min. Vert	5	-45.626	-5.317	-4.835
	Min. H_x	5	-45.626	-5.317	-4.835
	Min. H_z	5	-45.626	-5.317	-4.835

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	15.144	0.000	-0.000	-8.361	-15.219	0.000
Dead+Wind 0 deg - No Ice	15.144	-0.245	-16.333	-818.852	3.736	13.665
Dead+Wind 45 deg - No Ice	15.144	12.916	-12.916	-628.719	-635.577	6.781
Dead+Wind 90 deg - No Ice	15.144	16.333	0.245	10.594	-825.711	-5.693
Dead+Wind 135 deg - No Ice	15.144	13.262	13.262	638.803	-662.383	-14.665
Dead+Wind 180 deg - No Ice	15.144	0.245	16.333	802.130	-34.174	-13.665
Dead+Wind 225 deg - No Ice	15.144	-12.916	12.916	611.997	605.138	-6.781
Dead+Wind 270 deg - No Ice	15.144	-16.333	-0.245	-27.316	795.272	5.693
Dead+Wind 315 deg - No Ice	15.144	-13.262	-13.262	-655.525	631.945	14.665
Dead+Ice+Temp	27.961	0.000	-0.000	-13.805	-33.377	0.000
Dead+Wind 0 deg+Ice+Temp	27.961	-0.051	-4.284	-226.741	-29.432	3.269
Dead+Wind 45 deg+Ice+Temp	27.961	3.406	-3.406	-177.565	-197.138	1.352
Dead+Wind 90 deg+Ice+Temp	27.961	4.284	0.051	-9.859	-246.314	-1.694
Dead+Wind 135 deg+Ice+Temp	27.961	3.478	3.478	155.536	-202.718	-3.709
Dead+Wind 180 deg+Ice+Temp	27.961	0.051	4.284	199.131	-37.323	-3.269
Dead+Wind 225 deg+Ice+Temp	27.961	-3.406	3.406	149.956	130.383	-1.352
Dead+Wind 270 deg+Ice+Temp	27.961	-4.284	-0.051	-17.750	179.559	1.694
Dead+Wind 315 deg+Ice+Temp	27.961	-3.478	-3.478	-183.145	135.963	3.709
Dead+Wind 0 deg - Service	15.144	-0.085	-5.652	-288.808	-8.660	4.728
Dead+Wind 45 deg - Service	15.144	4.469	-4.469	-223.018	-229.876	2.346
Dead+Wind 90 deg - Service	15.144	5.652	0.085	-1.802	-295.666	-1.970

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 135 deg - Service	15.144	4.589	4.589	215.571	-239.151	-5.074
Dead+Wind 180 deg - Service	15.144	0.085	5.652	272.086	-21.778	-4.728
Dead+Wind 225 deg - Service	15.144	-4.469	4.469	206.296	199.437	-2.346
Dead+Wind 270 deg - Service	15.144	-5.652	-0.085	-14.920	265.228	1.970
Dead+Wind 315 deg - Service	15.144	-4.589	-4.589	-232.293	208.713	5.074

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	0.000	-15.144	0.000	-0.000	15.144	0.000	0.000%
2	-0.245	-15.144	-16.333	0.245	15.144	16.333	0.000%
3	12.916	-15.144	-12.916	-12.916	15.144	12.916	0.000%
4	16.333	-15.144	0.245	-16.333	15.144	-0.245	0.000%
5	13.262	-15.144	13.262	-13.262	15.144	-13.262	0.000%
6	0.245	-15.144	16.333	-0.245	15.144	-16.333	0.000%
7	-12.916	-15.144	12.916	12.916	15.144	-12.916	0.000%
8	-16.333	-15.144	-0.245	16.333	15.144	0.245	0.000%
9	-13.262	-15.144	-13.262	13.262	15.144	13.262	0.000%
10	0.000	-27.961	0.000	-0.000	27.961	0.000	0.000%
11	-0.051	-27.961	-4.284	0.051	27.961	4.284	0.000%
12	3.406	-27.961	-3.406	-3.406	27.961	3.406	0.000%
13	4.284	-27.961	0.051	-4.284	27.961	-0.051	0.000%
14	3.478	-27.961	3.478	-3.478	27.961	-3.478	0.000%
15	0.051	-27.961	4.284	-0.051	27.961	-4.284	0.000%
16	-3.406	-27.961	3.406	3.406	27.961	-3.406	0.000%
17	-4.284	-27.961	-0.051	4.284	27.961	0.051	0.000%
18	-3.478	-27.961	-3.478	3.478	27.961	3.478	0.000%
19	-0.085	-15.144	-5.652	0.085	15.144	5.652	0.000%
20	4.469	-15.144	-4.469	-4.469	15.144	4.469	0.000%
21	5.652	-15.144	0.085	-5.652	15.144	-0.085	0.000%
22	4.589	-15.144	4.589	-4.589	15.144	-4.589	0.000%
23	0.085	-15.144	5.652	-0.085	15.144	-5.652	0.000%
24	-4.469	-15.144	4.469	4.469	15.144	-4.469	0.000%
25	-5.652	-15.144	-0.085	5.652	15.144	0.085	0.000%
26	-4.589	-15.144	-4.589	4.589	15.144	4.589	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	80 - 66	0.560	20	0.052	0.013
T2	66 - 54	0.401	20	0.049	0.010
T3	54 - 24	0.282	20	0.040	0.007
T4	24 - 14.75	0.069	22	0.019	0.002
T5	14.75 - 0	0.032	22	0.011	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
84'	Lighting Rod 5/8" x 8'	20	0.560	0.052	0.013	258212
77'6"	(2) 800 10121	20	0.531	0.052	0.012	258212
75'6"	DC6-48-60-18-8F	20	0.508	0.052	0.012	258212
68'	Dual Ring Halo	20	0.423	0.050	0.010	109346
51'	Cat walk	22	0.255	0.038	0.007	93907

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	80 - 66	1.578	5	0.142	0.037
T2	66 - 54	1.140	5	0.134	0.028
T3	54 - 24	0.806	5	0.111	0.021
T4	24 - 14.75	0.198	5	0.055	0.006
T5	14.75 - 0	0.094	5	0.032	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
84'	Lighting Rod 5/8" x 8'	5	1.578	0.142	0.037	103310
77'6"	(2) 800 10121	5	1.498	0.142	0.035	103310
75'6"	DC6-48-60-18-8F	5	1.434	0.141	0.034	103310
68'	Dual Ring Halo	5	1.200	0.137	0.029	43722
51'	Cat walk	5	0.729	0.106	0.019	35747

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	80	Leg	A325N	0.625	12	1.083	12.885	0.084 ✔	1.333	Bolt DS
		Diagonal	A325N	0.625	2	1.252	4.792	0.261 ✔	1.333	Member Block Shear
		Horizontal	A325N	0.625	2	0.567	6.443	0.088 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.625	2	0.049	4.112	0.012 ✔	1	Member Block Shear
T2	66	Leg	A325N	0.625	12	2.778	12.885	0.216 ✔	1.333	Bolt DS
		Diagonal	A325N	0.625	2	1.042	4.792	0.217 ✔	1.333	Member Block Shear
		Top Girt	A325N	0.625	1	0.112	5.098	0.022 ✔	1.333	Member Bearing
T3	54	Leg	A325N	0.625	12	6.027	12.885	0.468 ✔	1.333	Bolt DS

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.625	2	1.329	4.792	0.277 ✔	1.333	Member Block Shear
		Top Girt	A325N	0.625	2	0.107	4.792	0.022 ✔	1.333	Member Block Shear
T4	24	Diagonal	A325N	0.625	2	1.696	5.132	0.330 ✔	1.333	Member Block Shear
		Top Girt	A325N	0.625	2	0.260	4.792	0.054 ✔	1	Member Block Shear
T5	14.75	Leg	A36	1.250	4	11.517	23.488	0.490 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.625	2	2.085	5.132	0.406 ✔	1.333	Member Block Shear
		Secondary Horizontal	A325N	0.625	1	0.816	2.130	0.383 ✔	1.333	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	80 - 66	L4x4x3/8	14'	3'6"	53.3 K=1.00	18.056	2.860	-6.496	51.639	0.126 ✔
T2	66 - 54	L4x4x3/8	12'1/2"	6'1/4"	91.7 K=1.00	14.003	2.860	-16.666	40.048	0.416 ✔
T3	54 - 24	L5x5x7/16	30'1-1/4"	7'6-5/16"	91.6 K=1.00	14.014	4.180	-36.159	58.579	0.617 ✔
T4	24 - 14.75	L5x5x7/16	9'3-3/8"	9'3-3/8"	113.0 K=1.00	11.269	4.180	-42.814	47.103	0.909 ✔
T5	14.75 - 0	L5x5x7/16	14'9-5/8"	7'10-17/32"	95.9 K=1.00	13.494	4.180	-53.687	56.403	0.952 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	80 - 66	L2 1/2x2x3/16	4'4-31/32"	3'8-29/32"	112.6 K=1.07	11.319	0.809	-2.963	9.157	0.324 ✔
T2	66 - 54	L2 1/2x2x3/16	8'9-11/16"	4'2-5/8"	119.0 K=1.00	10.432	0.809	-2.038	8.440	0.241 ✔
T3	54 - 24	L2 1/2x2x3/16	12'5-1/16"	6'11/32"	157.7 K=0.93	6.004	0.809	-2.709	4.857	0.558 ✔
T4	24 - 14.75	L3x3x3/16	14'3-15/32"	7'3/8"	136.5 K=0.96	8.016	1.090	-3.078	8.737	0.352 ✔

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 $\frac{P}{P_a}$
T5	14.75 - 0	L3x3x3/16	19'1-7/8"	9'11-5/32"	199.9 K=1.00	3.737	1.090	-4.609	4.073	1.132 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	L3 1/2x3 1/2x1/4	5'4-1/2"	4'7-3/4"	85.6 K=1.67	14.723	1.690	-1.134	24.883	0.046 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	2L4x4x1/4x3/8	5'4-1/2"	5'1/2"	84.2 K=1.74	14.536	3.880	-0.411	56.398	0.007 ✔
T5	14.75 - 0	L1 1/2x1 1/2x1/8	12'2-3/4"	11'9-3/4"	239.3 K=0.50	2.608	0.359	-0.816	0.937	0.871 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	66 - 54	L3x3x3/16	5'4-1/2"	4'9-5/8"	108.3 K=1.12	11.728	1.090	-0.046	12.784	0.004 ✔
T3	54 - 24	L2 1/2x2 1/2x3/16	6'9-1/2"	6'3/4"	136.6 K=0.93	8.005	0.902	-0.207	7.220	0.029 ✔
T4	24 - 14.75	L2 1/2x2x3/16	10'4"	9'6-1/4"	210.8 K=0.79	3.362	0.809	-0.577	2.720	0.212 ✔
		KL/R > 200 (C) - 122								

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	L4x4x3/8	14'	3'6"	34.1	21.600	2.860	4.395	61.776	0.071 ✔
T2	66 - 54	L4x4x3/8	12'1/2"	6'1/4"	58.7	21.600	2.860	13.297	61.776	0.215 ✔
T3	54 - 24	L5x5x7/16	30'1-1/4"	7'6-5/16"	58.3	21.600	4.180	30.369	90.288	0.336 ✔
T4	24 - 14.75	L5x5x7/16	9'3-3/8"	9'3-3/8"	71.9	21.600	4.180	36.092	90.288	0.400 ✔
T5	14.75 - 0	L5x5x7/16	14'9-5/8"	1"	0.6	21.600	4.180	46.066	90.288	0.510 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	L2 1/2x2x3/16	4'4-31/32"	3'8-29/32"	82.8	29.000	0.501	2.504	14.537	0.172 ✔
T2	66 - 54	L2 1/2x2x3/16	8'3-21/32"	3'11-25/32"	83.6	29.000	0.501	2.084	14.537	0.143 ✔
T3	54 - 24	L2 1/2x2x3/16	11'3/4"	5'4-1/2"	111.5	29.000	0.501	2.658	14.537	0.183 ✔
T4	24 - 14.75	L3x3x3/16	14'3-15/32"	7'3/8"	92.4	29.000	0.712	3.391	20.649	0.164 ✔
T5	14.75 - 0	L3x3x3/16	19'1-7/8"	9'11-5/32"	126.9	29.000	0.712	4.170	20.649	0.202 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	L3 1/2x3 1/2x1/4	5'4-1/2"	4'7-3/4"	55.5	29.000	1.127	1.134	32.679	0.035 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	2L4x4x1/4x3/8	5'4-1/2"	5'1/2"	48.4	21.600	3.880	0.586	83.808	0.007 ✔
T5	14.75 - 0	L1 1/2x1 1/2x1/8	12'2-3/4"	11'9-3/4"	304.7	29.000	0.199	0.816	5.777	0.141 ✔

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 $\frac{P}{P_a}$

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	80 - 66	L2x2x3/16	5'4-1/2"	4'7-3/4"	98.1	29.000	0.431	0.098	12.493	0.008* ✔
T2	66 - 54	L3x3x3/16	5'4-1/2"	4'9-5/8"	64.4	29.000	0.712	0.112	20.649	0.005 ✔
T3	54 - 24	L2 1/2x2 1/2x3/16	6'9-1/2"	6'3/4"	99.6	29.000	0.571	0.214	16.560	0.013 ✔
T4	24 - 14.75	L2 1/2x2x3/16	10'4"	9'6-1/4"	198.4	29.000	0.501	0.520	14.537	0.036* ✔

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	80 - 66	Leg	L4x4x3/8	3	-6.496	68.835	9.4	Pass
T2	66 - 54	Leg	L4x4x3/8	58	-16.666	53.385	31.2	Pass
T3	54 - 24	Leg	L5x5x7/16	78	-36.159	78.086	46.3	Pass
T4	24 - 14.75	Leg	L5x5x7/16	118	-42.814	62.788	68.2	Pass
T5	14.75 - 0	Leg	L5x5x7/16	134	-53.687	75.186	71.4	Pass
T1	80 - 66	Diagonal	L2 1/2x2x3/16	13	-2.963	12.206	24.3	Pass
T2	66 - 54	Diagonal	L2 1/2x2x3/16	63	-2.038	11.250	18.1	Pass
T3	54 - 24	Diagonal	L2 1/2x2x3/16	87	-2.709	6.475	41.8	Pass
T4	24 - 14.75	Diagonal	L3x3x3/16	128	-3.078	11.647	26.4	Pass
T5	14.75 - 0	Diagonal	L3x3x3/16	142	-4.609	5.429	84.9	Pass
T1	80 - 66	Horizontal	L3 1/2x3 1/2x1/4	43	-1.134	33.168	3.4 6.6 (b)	Pass
T1	80 - 66	Secondary Horizontal	2L4x4x1/4x3/8	35	-0.411	75.179	0.5	Pass
T5	14.75 - 0	Secondary Horizontal	L1 1/2x1 1/2x1/8	146	-0.816	1.249	65.3	Pass
T1	80 - 66	Top Girt	L2x2x3/16	6	0.098	12.493	0.8 0.9 (b)	Pass
T2	66 - 54	Top Girt	L3x3x3/16	23	0.112	27.525	0.4 1.6 (b)	Pass
T3	54 - 24	Top Girt	L2 1/2x2 1/2x3/16	83	-0.207	9.624	2.2	Pass
T4	24 - 14.75	Top Girt	L2 1/2x2x3/16	122	-0.577	3.626	15.9	Pass
							Summary	
						Leg (T5)	71.4	Pass
						Diagonal (T5)	84.9	Pass
						Horizontal (T1)	6.6	Pass
						Secondary Horizontal (T5)	65.3	Pass
						Top Girt	15.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						(T4) Bolt Checks	36.8	Pass
						RATING =	**84.9**	**Pass**

Program Version 6.1.4.1

PROJECT INFORMATION

SCOPE OF WORK:

- AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR, FOR A TOTAL (3) NEW ANTENNAS. (1) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO REMAIN. (1) EXISTING ANTENNA PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE RELOCATED. (1) EXISTING ANTENNA PER SECTOR FOR (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- AT&T RRUs: (1) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (1) NEW RRUS–A2 MODULE PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUS–A2 MODULES. (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUs.
- AT&T SQUID: (1) EXISTING DC–6 SQUID TO REMAIN.

SITE ADDRESS:	213 HIGH STREET PORTLAND, CT 06480	
LATITUDE: LONGITUDE:	41.5807139 –72.62386	41° 34' 50.57004"N –72° 37' 25.896"W
USID:	59359	
TOWER OWNER:	AT&T MOBILITY	
TYPE OF SITE:	LATTICE TOWER/INDOOR EQUIPMENT	
TOWER HEIGHT:	80'–0"±	
RAD CENTER:	77'–6"±	
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY	

DRAWING INDEX

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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:	
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035005
SITE NUMBER: CT1066
SITE NAME: PORTLAND

VICINITY MAP

FROM ROCKY HILL, CT: HEAD NE ON ENTERPRISE DR. TOWARD CAPITAL BLVD, TURN LEFT ONTO CAPITAL BLVD, TURN LEFT ONTO WEST ST, TURN LEFT TO MERGE ONTO I–91 S TOWARD NEW HAVEN, TAKE EXIT 22S ON THE LEFT TO MERGE ONTO CT–9 S (CHESTER BOWLES HWY.) IMMEDIATELY AFTER UNDERPASS TAKE 2ND RIGHT ONTO MAIN ST. AND CROSS ARRIGONI BRIDGE, TURN RIGHT ONTO MARBOROUGH ST. TURN LEFT ONTO HIGH ST, SITE WILL BE ON THE RIGHT AT PORTLAND MIDDLE SCHOOL DRIVEWAY ENTRANCE.

PROJECT TEAM

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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.

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EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1066
SITE NAME: PORTLAND

213 HIGH STREET
PORTLAND, CT 06480
MIDDLESEX COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/04/16	CLIENT COMMENTS INCORPORATED	JW	NDB	NDB
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

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

SEAL: STATE OF CONNECTICUT · DOUGLAS G. BOLDUC · 23643 · REGISTERED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15097–EMP	T–1	1

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 (EMPIRE TELECOM).

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.

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

23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY DEWBERRY ENGINEERING FOR A RECENT UPGRADE DATED 06/25/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1066
SITE NAME: PORTLAND

213 HIGH STREET
PORTLAND, CT 06480
MIDDLESEX COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/04/16	CLIENT COMMENTS INCORPORATED	JW	NDB	NDB
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

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

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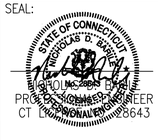

PROFESSIONAL ENGINEER
CT LICENSE NO. 30643

AT&T

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
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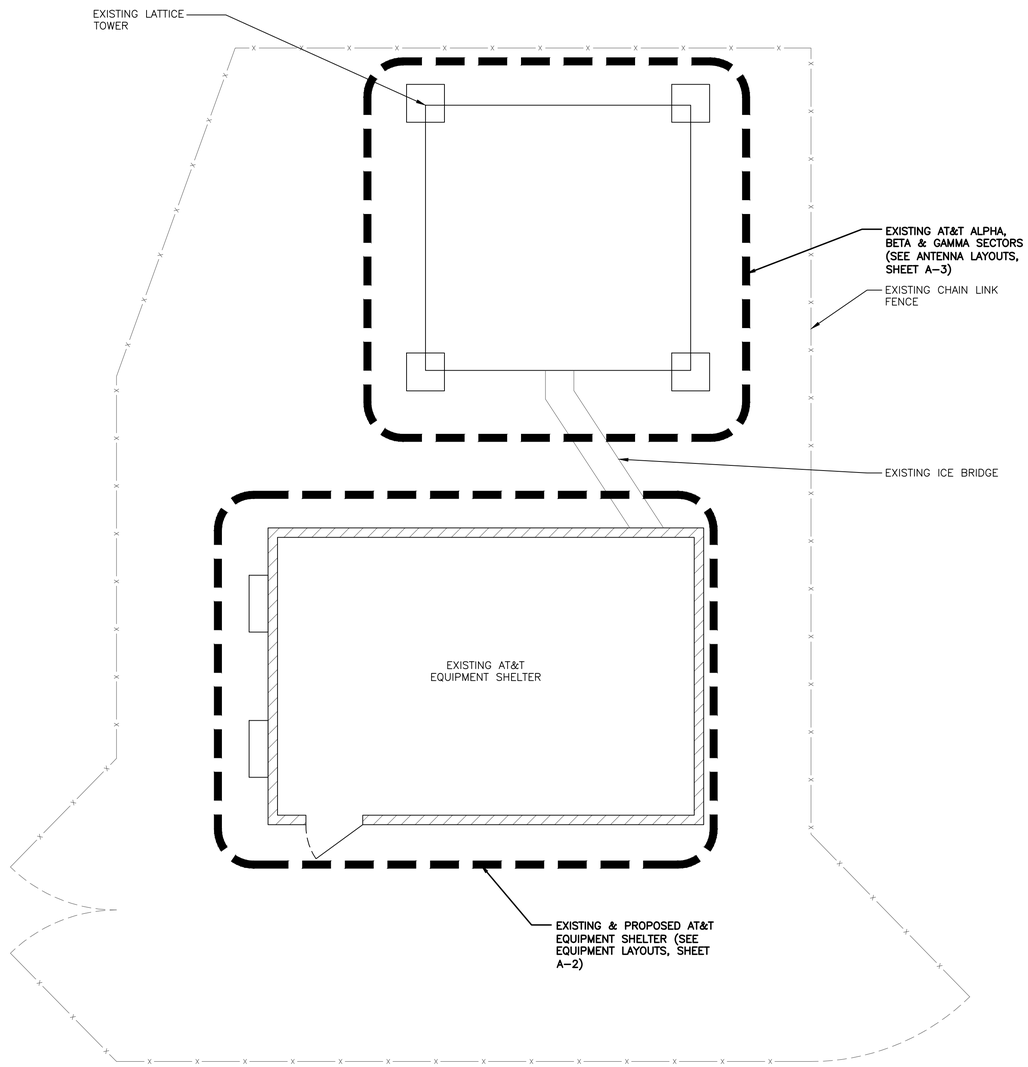

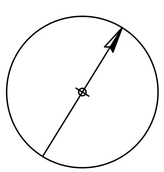

COMPOUND LAYOUT

SCALE: 1/4" = 1'–0"

0 2 4 8

GRAPHIC SCALE: 1/4"=1'–0"

NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

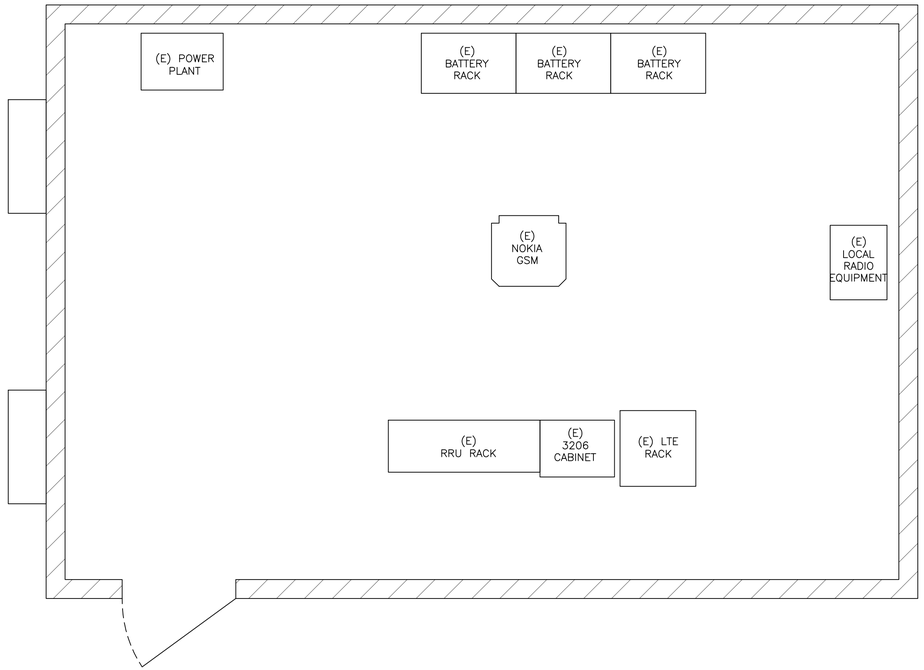
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARTOLOMEO
NO. 28843
REGISTERED PROFESSIONAL ENGINEER
PROJECT ELECTRICAL ENGINEER
CT (PROFESSIONAL ENGINEER) 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15097–EMP	A–1	1

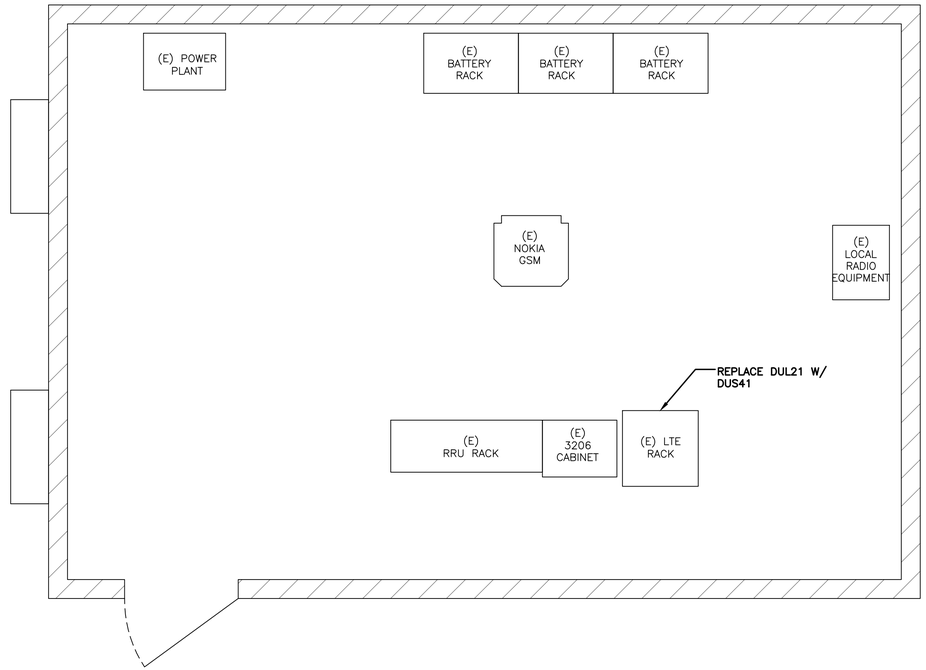


NORTH

EXISTING EQUIPMENT LAYOUT

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

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



NORTH

PROPOSED EQUIPMENT LAYOUT

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

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

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NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

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

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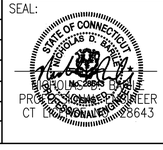

PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE: EQUIPMENT LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
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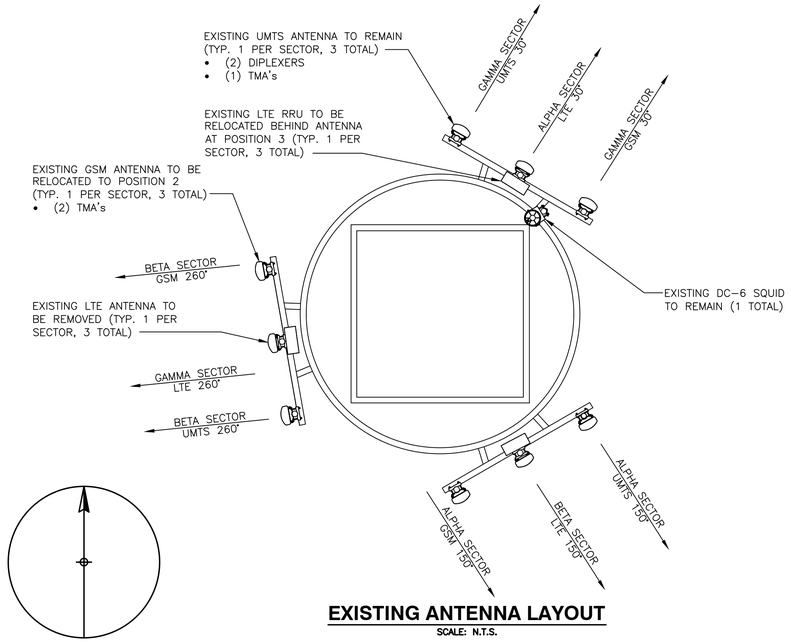
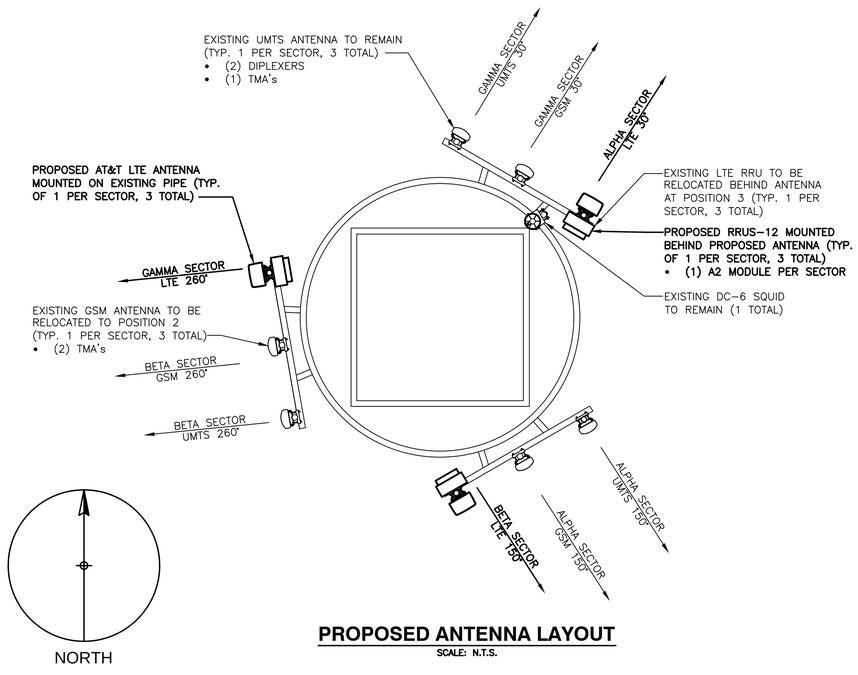


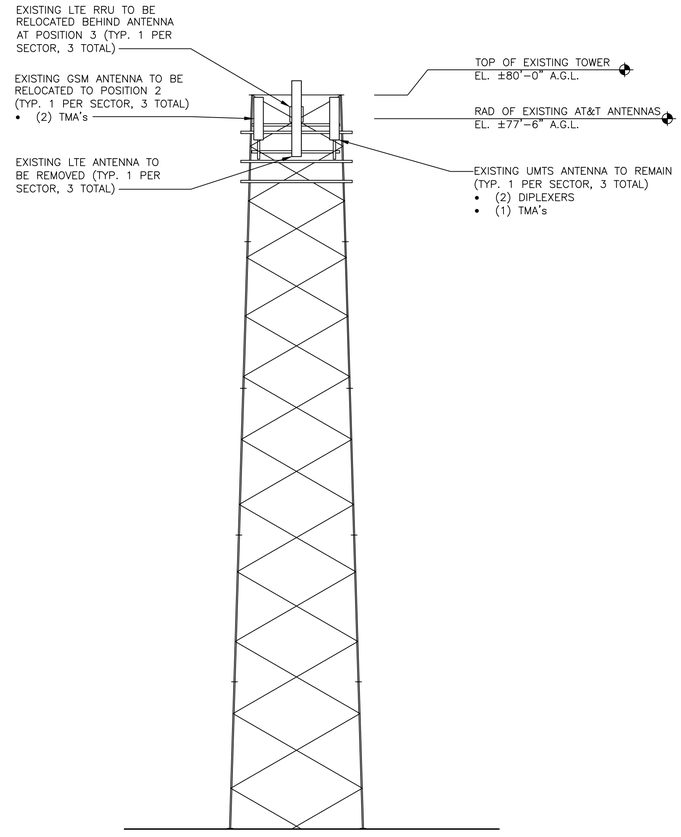
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



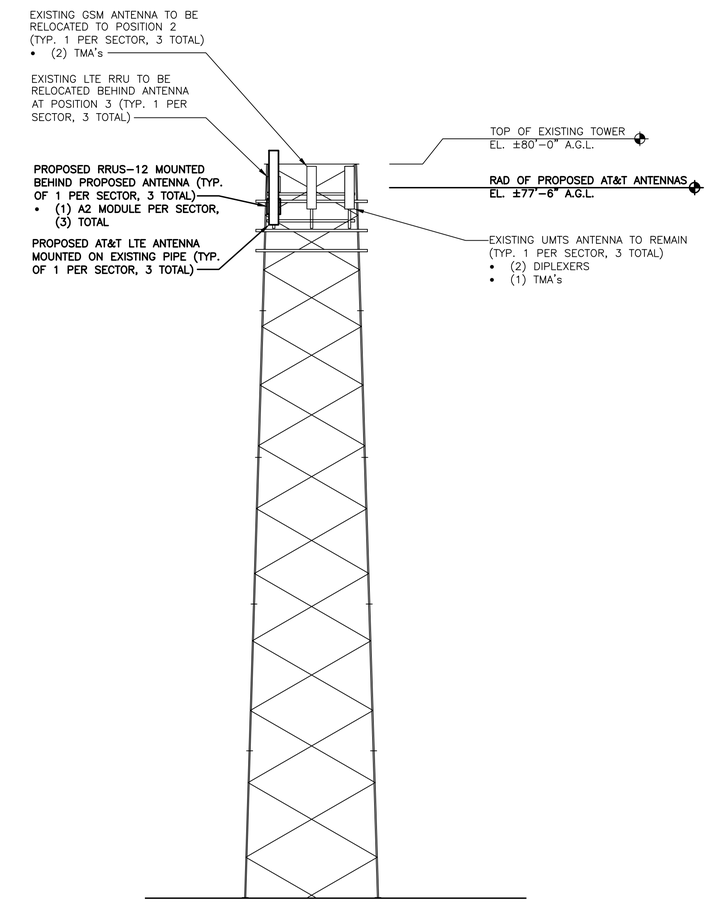
PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

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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0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

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

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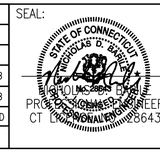
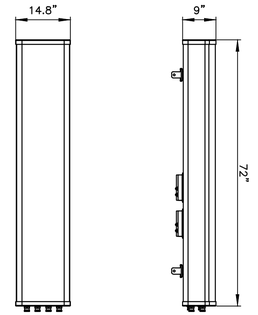


AT&T

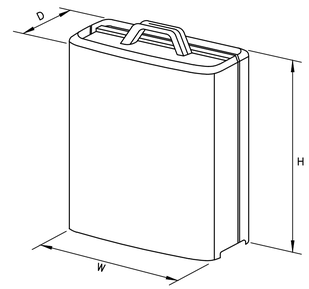
DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15097-EMP	A-3	1



MANUFACTURER	CCI
MODEL	OPA-65R-BUU-H6
WEIGHT	50.7 LBS

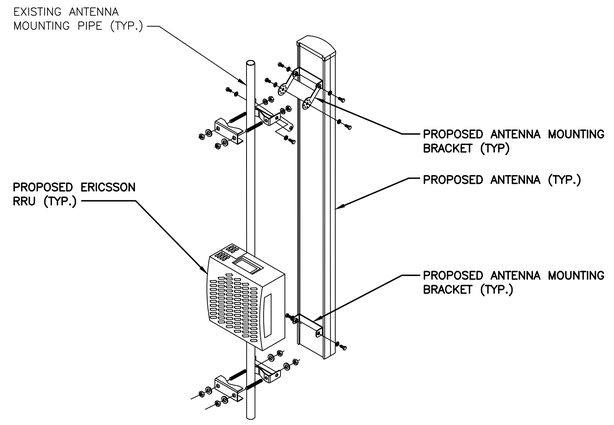
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4"x18.5"x7.5"	58 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	A2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A3	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	–	–	–	–
BETA	B1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	B2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B3	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	–	–	–	–
GAMMA	G1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	G2	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G3	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	–	–	–	–

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	A2	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	A3	**CCI**	**HPA-65R-BUU-H6**	**72"x14.8"x9"**
	–	–	–	–
BETA	B1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	B2	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	B3	**CCI**	**HPA-65R-BUU-H6**	**72"x14.8"x9"**
	–	–	–	–
GAMMA	G1	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	G2	KATHREIN	800 10121 @850	54.5"x10.3"x5.9"
	G3	**CCI**	**HPA-65R-BUU-H6**	**72"x14.8"x9"**
	–	–	–	–

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-12**	**20.4"x18.5"x9.5"**	**A2 MODULE**	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	–	–	–		
BETA	**ERICSSON**	**RRUS-12**	**20.4"x18.5"x9.5"**	**A2 MODULE**	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	–	–	–		
GAMMA	**ERICSSON**	**RRUS-12**	**20.4"x18.5"x9.5"**	**A2 MODULE**	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	–	–	–		

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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SITE NUMBER: CT1066
SITE NAME: PORTLAND

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PORTLAND, CT 06480
MIDDLESEX COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/04/16	CLIENT COMMENTS INCORPORATED	JW	NDB	NDB
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

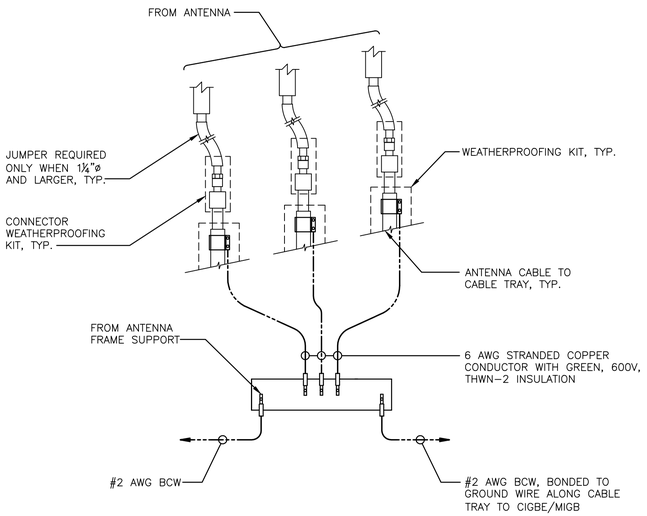
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARTLETT
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

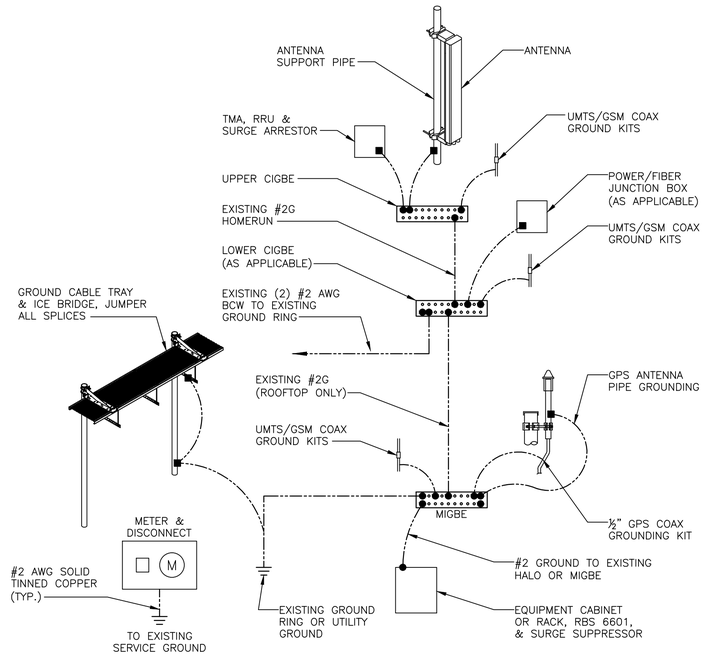
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15097-EMP	A-4	1



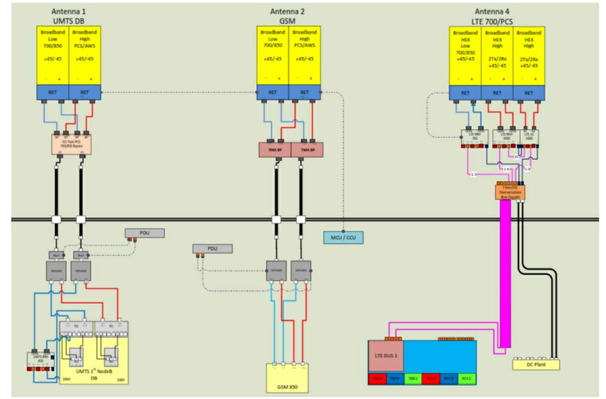
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



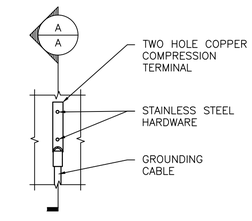
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

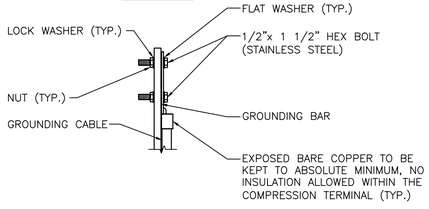


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



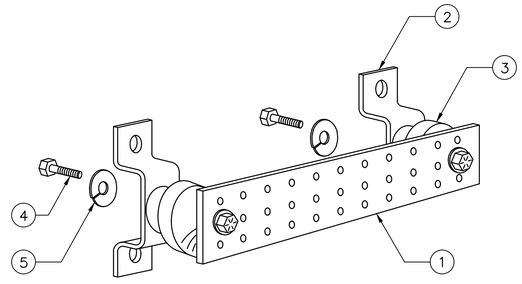
SECTION "A–A"

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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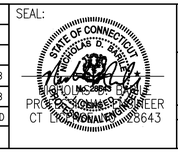

PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
GROUNDING, ONE–LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15097–EMP	G–1	1