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

August 3, 2012

Stephanie Wenderoth
Nexlink Global Services
Suite A, Building 2
800 Marshall Phelps Road
Windsor, CT 06095

RE: **EM-AT&T-164-120716** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 419 Broad Street, Windsor, Connecticut.

Dear Ms. Wenderoth:

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

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated July 12, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Donald Trinks, Mayor, Town of Windsor
Peter Souza, Town Manager, Town of Windsor
Eric Barz, Town Planner, Town of Windsor

CONNECTICUT SITING COUNCIL
NOTICE OF INTENT TO MODIFY AN EXISTING TOWER FACILITY
EXEMPT MODIFICATION FILING FORM
Public Utility Environmental Standards Act, Connecticut General Statutes §§ 16-50g - 16-50aa
Regulations of Connecticut State Agencies §§ 16-50j-72(b)(2), 16-50j-73
EM-AT&T-164-120716

TO BE COMPLETED BY FILER

Date: 7/12/12

Filer Name and Contact Information
Name: Stephanie Wenderoth
Address: Nexlink Global Services; Suite A Building 2
800 Marshall Phelps Road, Windsor, CT 06095
Phone Number: 401.477.2938

ORIGINAL

RECEIVED
JUL 18 2012
CONNECTICUT SITING COUNCIL

Wireless Carrier: AT&T

Tower Owner: AT&T

Tower Site Address: 419 Broad Street, Windsor CT

Municipality and Name of Chief Elected Official Provided A Copy Of This Notice:
Donald S. Trinks; Windsor Mayor

Description of Exempt Modification (including antenna and equipment changes):
Add 3 LTE Antennas, new conduit, RRUs and surge arrestor.

Attachments
__Y__ Plans
__Y__ Power density calculations if applicable
__Y__ Tower structural report if applicable
__Y__ $625.00 Filing Fee

If required:
Municipality w/i 2,500' & Name of Chief Elected Official Provided A Copy Of This Notice:

Underlying Property Owner Provided A Copy Of This Notice:

FOR STAFF USE ONLY

____ Modification will not result in an increase in tower height
____ Modification is within existing site boundaries
____ Modification will not increase noise levels at the site boundary by 6 dbA or more, or to levels that exceed State & local criteria
____ Modification will meet FCC and DEEP MPE limits
____ Modification will not result in significant adverse change in physical or environmental

characteristics of the site

____ Modification will not impair the structural integrity of the facility as determined by PE

____ If yes to all of the above, approval of acknowledgement letter

July 12, 2012

VIA UPS Delivery

Ms. Linda Roberts, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: AT&T Mobility - Notice of Exempt Modification
419 Broad Street, Windsor CT

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of AT&T Mobility ("AT&T"). AT&T is enhancing the capabilities of its wireless system in Connecticut by implementing LTE technology. In order to do so, AT&T will modify antenna and equipment configurations at a number of existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section I6-50j-73, a copy of this letter and attachments is being sent to Donald S. Trinks; Windsor Mayor.

AT&T plans to modify the existing facility at 419 Broad Street, owned by the Omnipoint Communications, Inc (coordinates 41.845881, -72.646138). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to AT&T's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C. S.A. Section | 6-50j-l 2(b)(2).

1. The height of the overall structure will be unaffected. The existing antennas will remain and AT&T will add three (3) new antennas, six (6) RRU's and one (1) surge arrestor. Additionally, AT&T will install one (1) fiber cable and two (2) DC control cables within the existing monopole.

2. The proposed changes will not extend the site boundaries. AT&T will install additional equipment in the existing equipment shelter. Thus, there will no effect on the site compound.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed change will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environment as calculated for a mixed frequency site. As indicated in the attached

power density calculations, AT&T's operations at the site will result in a power density of 3.53%; the combined site operations will result in a total power density of 25.52%.

Please feel free to call me with any questions or concerns regarding this matter.
Thank you for your consideration.

Respectfully submitted,

AT&T Mobility
Stephanie Wenderoth, Consultant
wenderoths@nexlinkgs.com
401.477.2938

Cc: Donald S. Trinks; Windsor Mayor
141 Grove Street
Windsor, Ct 06095

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT1026 Windsor

419 Broad Street, Windsor, CT 06095

July 6, 2012

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole tower located at 419 Broad Street in Windsor, CT. The coordinates of the tower are 41° 50' 45.2" N, 72° 38' 46.1" W.

AT&T is proposing the following modifications:

1) Replace six dual-band (850/1900 MHz) panel antennas with six multi-band (700/850/1900/2100 MHz) panel antennas (two per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular UMTS	*100*	*880*	*1*	*500*	*0.0180*	*0.5867*	*3.06%*
Cingular GSM	*100*	*880*	*2*	*296*	*0.0213*	*0.5867*	*3.63%*
Cingular GSM	*100*	*1930*	*2*	*427*	*0.0307*	*1.0000*	*3.07%*
Clearwire	64	2496	2	153	0.0269	1.0000	2.69%
Clearwire	64	18 GHz	1	211	0.0185	1.0000	1.85%
Pocket	74	2130	3	631	0.1243	1.0000	12.43%
T-Mobile	94	1935	8	154	0.0501	1.0000	5.01%
AT&T UMTS	103	880	2	565	0.0038	0.5867	0.65%
AT&T UMTS	103	1900	2	875	0.0059	1.0000	0.59%
AT&T LTE	103	734	1	1313	0.0045	0.4893	0.91%
AT&T GSM	103	880	1	491	0.0017	0.5867	0.28%
AT&T GSM	103	1900	4	813	0.0110	1.0000	1.10%
						Total	**25.52%**

Table 1: Carrier Information [1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the B+T Group Structural Analysis dated June 22, 2012

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **25.52% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

July 6, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

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

(B) Limits for General Population/Uncontrolled Exposure[5]

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

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

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

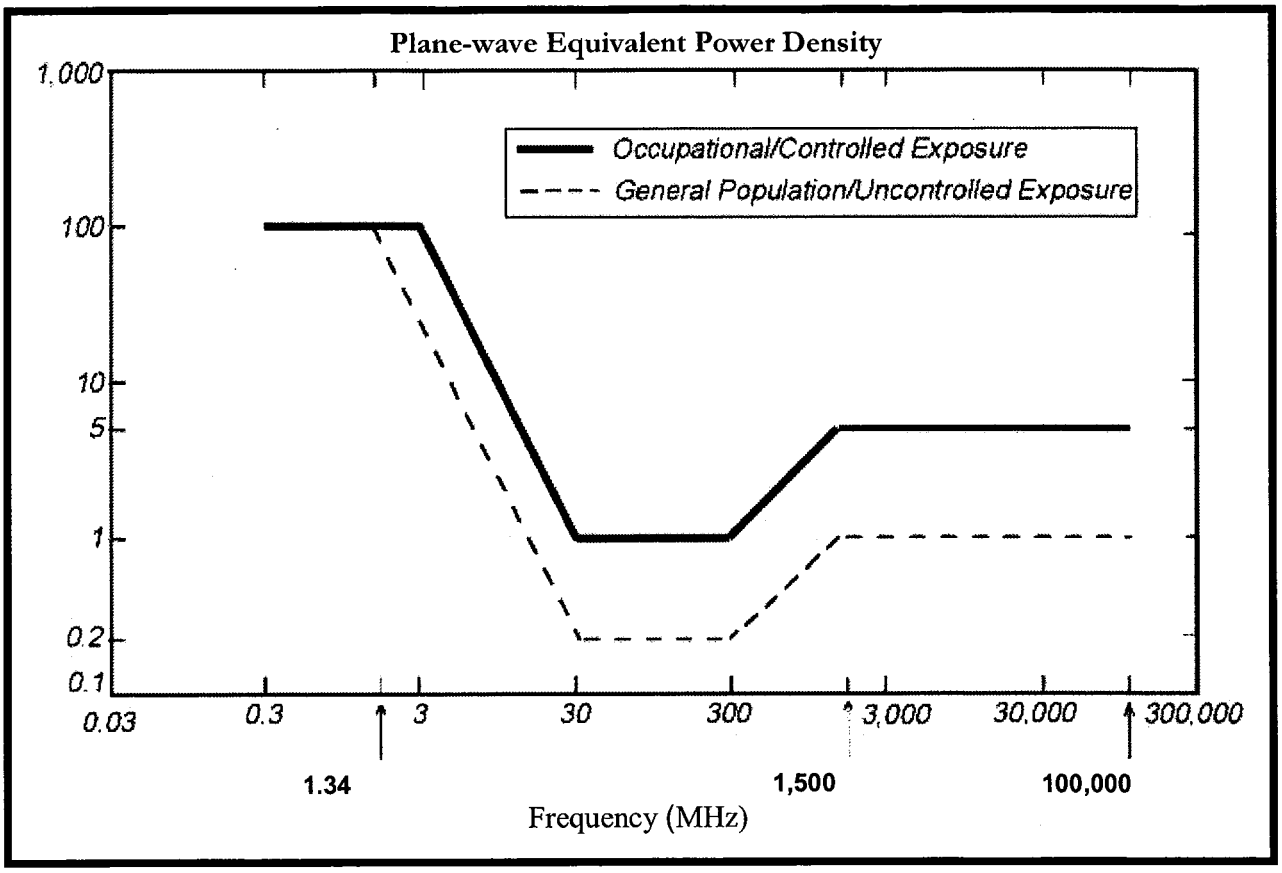
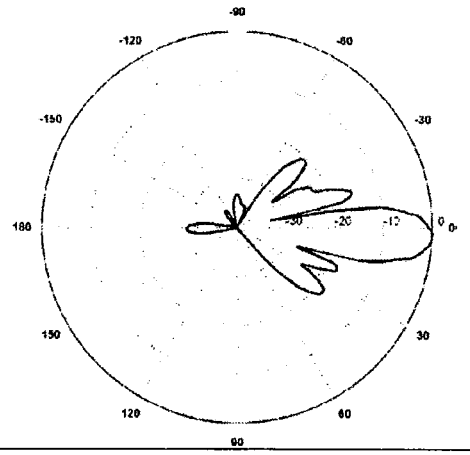


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

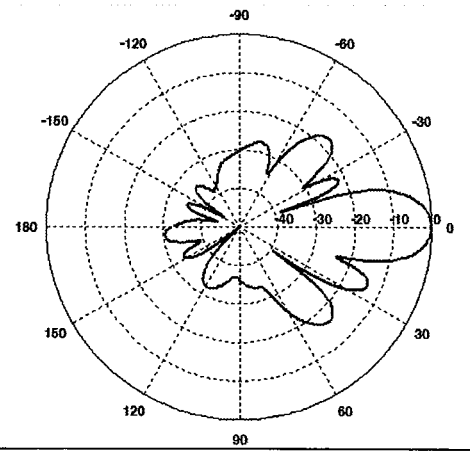
700 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	± 45°
Size L x W x D:	72" x 11.8" x 5.9"



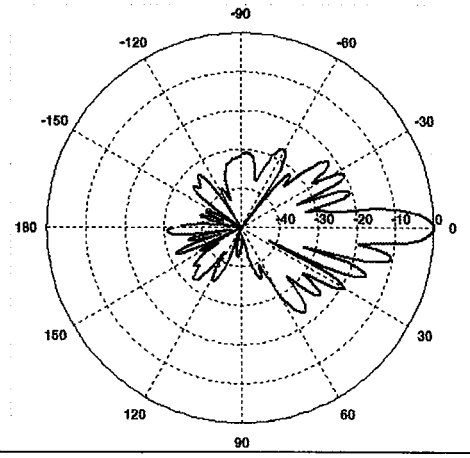
850 MHz UMTS

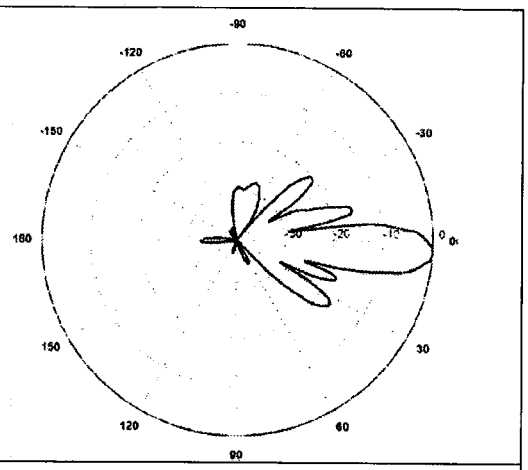
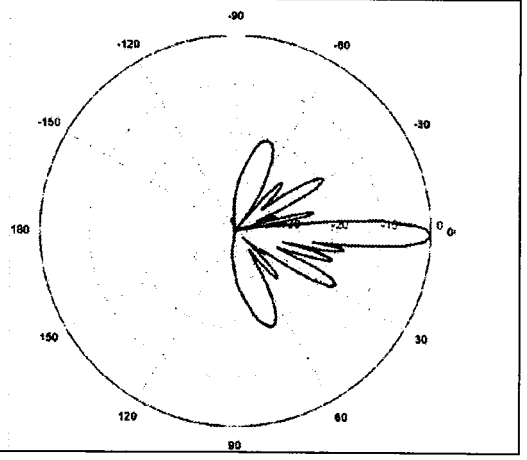
Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	82°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.0" x 11.0" x 5.0"



1900 MHz UMTS

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	86°
Polarization:	Dual Linear ±45°
Size L x W x D:	55.0" x 11.0" x 5.0"



850 MHz GSM Manufacturer: KMW Communications Model #: AM-X-CD-16-65-00T Frequency Band: 824-894 MHz Gain: 13.9 dBd Vertical Beamwidth: 11.5° Horizontal Beamwidth: 63° Polarization: ± 45° Size L x W x D: 72" x 11.8" x 5.9"	
1900 MHz GSM Manufacturer: KMW Communications Model #: AM-X-CD-16-65-00T Frequency Band: 1850-1900 MHz Gain: 15.3 dBd Vertical Beamwidth: 6.0° Horizontal Beamwidth: 67° Polarization: ± 45° Size L x W x D: 72" x 11.8" x 5.9"	

Nexlink Global Services, Inc.
800 Marshall Phelps Road
Windsor, CT 06095

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119

June 22, 2012

B&T No.: 84425.001

STRUCTURAL ANALYSIS
101' Monopole Tower

AT&T DESIGNATION:	Site ID:	59344-A
	Site FA:	10035043
	Site Name:	Windsor
	AT&T Project:	MOD LTE W3 011912
ANALYSIS CRITERIA:	Codes:	TIA/EIA-222-F (80.5 mph fastest mile) IBC 2006
SITE DATA:		419 Broad Street, Windsor, CT, Hartford County Latitude 41.845881°, Longitude --72.646138° Market MA/RI/VT/NH/ME/CT

Ms. Stephanie Wenderoth,

B&T Engineering, Inc. is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned 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

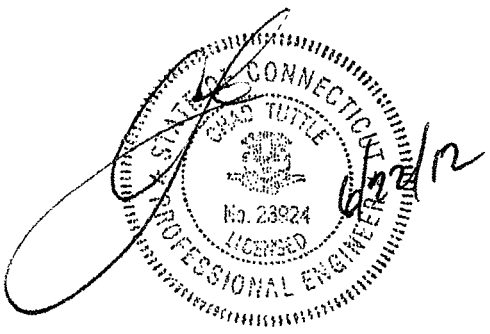
Tower Stress Level with Proposed Equipment:	**72.2%**	**Pass**
Foundation Ratio with Proposed Equipment:	**42.9%**	**Pass**

We at B&T Engineering, Inc. appreciate the opportunity of providing our continuing professioinal services to you and Nexlink Global Services, Inc.. 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: Shardul Kadam, E.I.

Analysis Reviewed by: Chad E. Tuttle, P.E.
COA: 0
Exp: 1/0/1900



APPENDIX A

TNXTOWER OUTPUT

ANALYSIS RESULTS:

Table 1 - Section Capacity (Summary)

Component (Tower Section)	% Capacity	Pass / Fail
101 - 87.5	46.8	Pass
87.5 - 80	62.7	Pass
80 - 46.1	66.5	Pass
46.1 - 12	72.2	Pass
12.0 - 0	57.4	Pass

Table 2 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	56.7	**Pass**
1	Base Plate	Base	70.0	**Pass**
1	Base Foundation	Base	42.9	**Pass**

Structure Rating (max from all components) =	**72.2%**

Notes:

1.) See additional documentation in "Appendix B - Calculations" for calculation supporting the % capacity consumed.

2.) Capacities up to 100% are considered acceptable based on analysis methods used.

3.) Foundation capacity determined by comparing analysis reactions to original design reactions.

Recommendations:

N/A

ANALYSIS PROCEDURE:

Table 4 - Documents Provided

Document	Description	Date	Source
Tower Data	Tower Mapping by BTE Management Grp, LLC	4/27/2012	On File
Foundation Information	Information Not Available	N/A	N/A
Geotech Report	NA	N/A	N/A
Loading	Equipment Mod form	2/2/2012	Siterra
	RFDS	3/1/2012	
Previous Structural Analysis	GPD Group	6/21/2010	Siterra

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. Existing Loading was considered as per BTE mapping report dated 04/27/2012.
7. Proposed Loading was considered as per RFDS dated 03/01/2012.
8. Modifications were installed according to the modification drawings by GPD dated 04/29/09.

If any of these assumptions have been made in error, B&T Engineering 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	100	103	6	CSS	DUO1417-8686-4-0-C*	1	LP Deck	12	1-1/4"
AT&T	100	103	3	Powerwave	RA21.7770.00				
AT&T	100	103	6	ADC	CG-1900W800				
AT&T	100	103	3	Powerwave	TT19-08BP111-001				
T-Mobile	94	93.5	6	RFS	APX16DWV-16DWVS	1	LP Deck	18	7/8"
T-Mobile	94	93.5	3	Ericsson	KRY112				
T-Mobile	94	93.5	3	Ericsson	E15S09P94 02				
Metro PCS	75.5	75.5	3	RFS	APXV18-206517S	3	Pipe Mount	6	1-5/8"
Unknown	11	11	1	Unknown	GPS	1	Standoff	1	1/2"

*(6) DUO1417-8686-4-0-C to be Removed

Proposed Loading

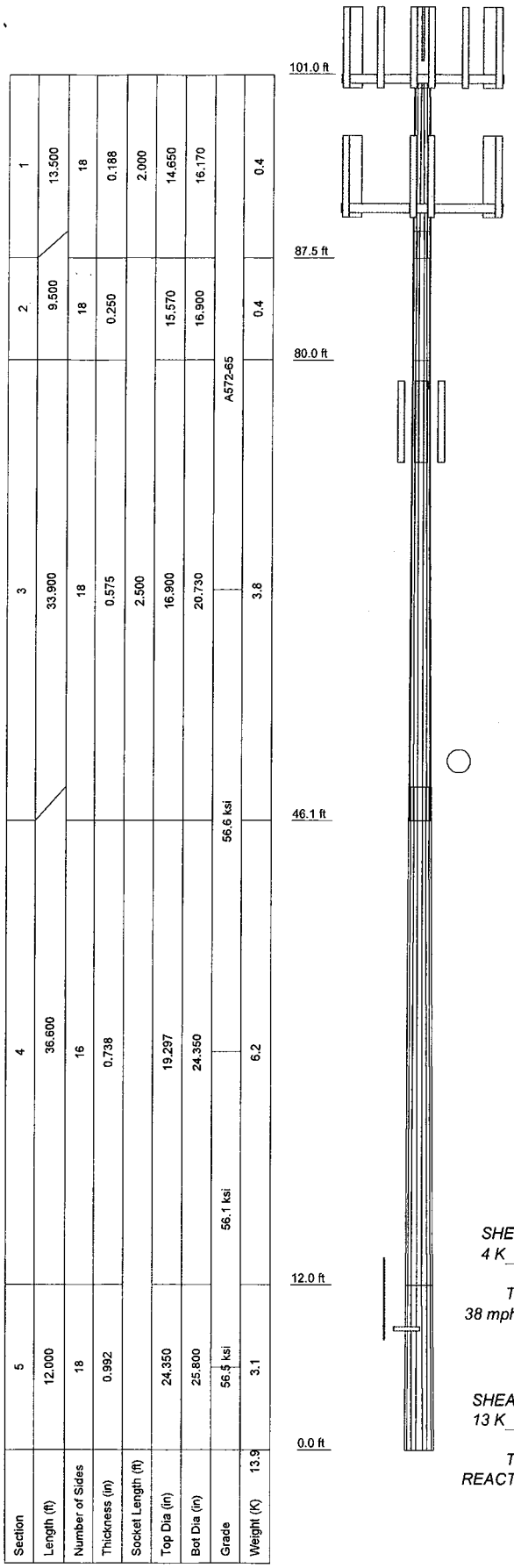
Antenna						Mount		Transmission Line	
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Manufacturer	Model	Quantity	Type	Quantity	Size (in)
AT&T	103	103	6	KMW	AM-X-CD-16-65-00T			3	0.5
AT&T	103	103	3	CCI	DTMABP7819VG12A				
AT&T	103	103	6	Ericsson	RRU-11				
AT&T	103	103	1	Raycap	DC6-48-60-18-8F				

Future Loading

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

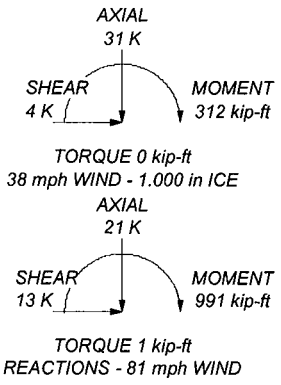
APPENDIX B

CALCULATIONS



Section	1	2	3	4	5
Length (ft)	13.500	9.500	33.900	36.600	12.000
Number of Sides	18	18	18	16	18
Thickness (in)	0.188	0.250	0.575	0.738	0.992
Socket Length (ft)	2.000		2.500		
Top Dia (in)	14.650	15.570	16.900	19.297	24.350
Bot Dia (in)	16.170	16.900	20.730	24.350	25.800
Grade					
Weight (K)	0.4	0.4	3.8	6.2	3.1

13.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 5' (E)	104	(2) APX16DWV-16DWVS-C w/ Mount Pipe (E)	93.5
RA21.7770.00 w/ Mount Pipe (E)	103	(2) APX16DWV-16DWVS-C w/ Mount Pipe (E)	93.5
RA21.7770.00 w/ Mount Pipe (E)	103	(2) APX16DWV-16DWVS-C w/ Mount Pipe (E)	93.5
RA21.7770.00 w/ Mount Pipe (E)	103	KRY 112 71/2 (E)	93.5
(2) CG-1900W800-FULL-DIN (E)	103	KRY 112 71/2 (E)	93.5
(2) CG-1900W800-FULL-DIN (E)	103	KRY 112 71/2 (E)	93.5
(2) CG-1900W800-FULL-DIN (E)	103	E15S09P94 (E)	93.5
TT19-08BP111-001 (E)	103	E15S09P94 (E)	93.5
TT19-08BP111-001 (E)	103	E15S09P94 (E)	93.5
TT19-08BP111-001 (E)	103	Platform Mount [LP 303-1] (E)	91.5
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	103	6' x 2" Mount Pipe (E)	91.5
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	103	6' x 2" Mount Pipe (E)	91.5
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	103	6' x 2" Mount Pipe (E)	91.5
DTMA1819VG12A (P)	103	APX18-206517S-C-A20 w/Mount Pipe (E)	75.5
DTMA1819VG12A (P)	103	APX18-206517S-C-A20 w/Mount Pipe (E)	75.5
DTMA1819VG12A (P)	103	APX18-206517S-C-A20 w/Mount Pipe (E)	75.5
(2) RRU-11 (P)	103	GPS_A (E)	11
(2) RRU-11 (P)	103	Side Arm Mount [SO 701-1] (E)	9
(2) RRU-11 (P)	103		
DC6-48-60-18-8F (P)	103		
Platform Mount [LP 712-1] (E)	101		
Platform Ladder (E)	101		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	56.1 ksi	56 ksi	65 ksi
56.6 ksi	57 ksi	65 ksi	56.5 ksi	57 ksi	80 ksi

TOWER DESIGN NOTES

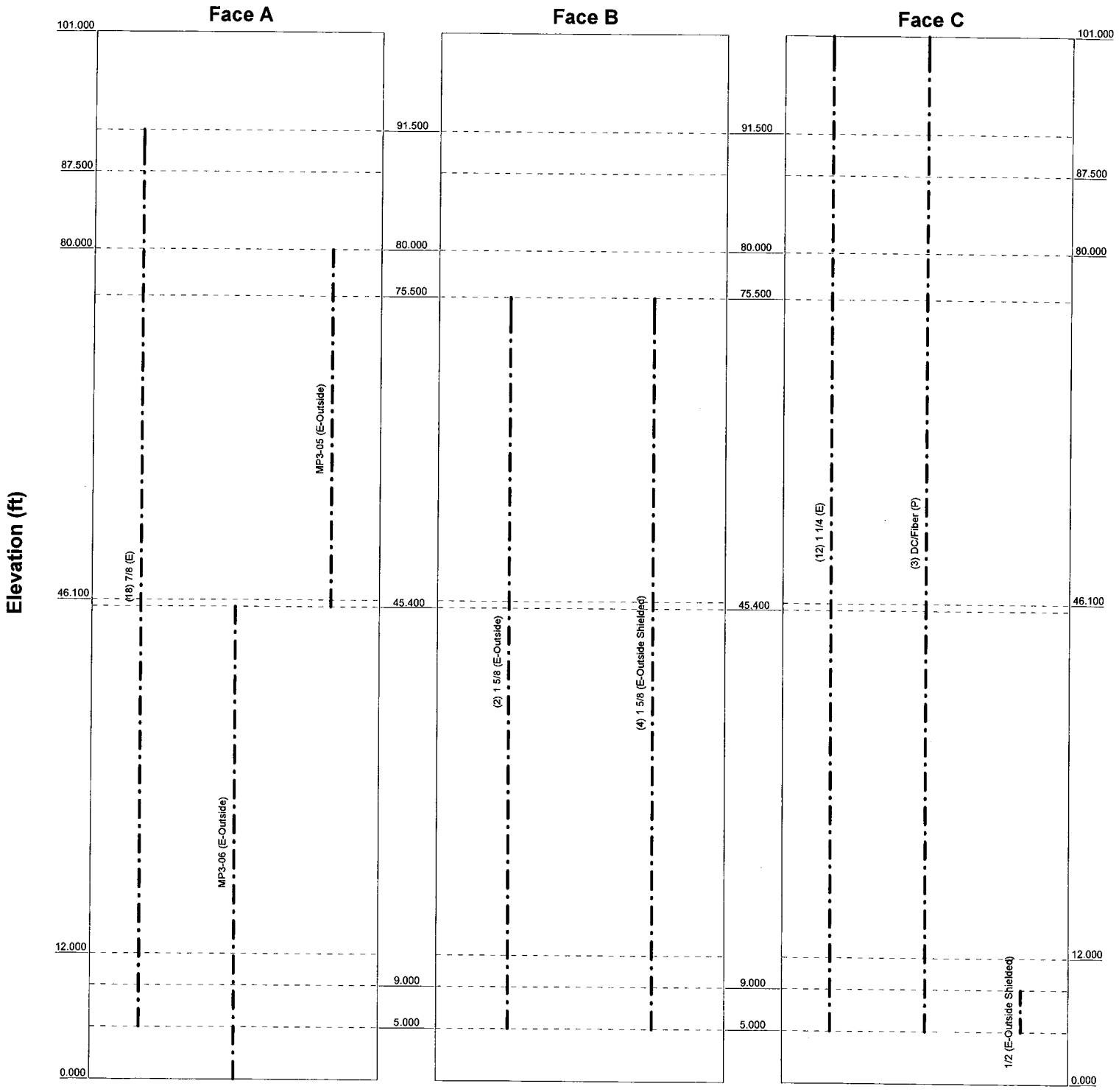
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 81 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 72.2%

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

Job: 84425.001- Windsor, CT (Site# CT 1026)		
Project: 101' EEI MP/ AT&T Mobility Co-Locate		
Client: Nexlinkgs	Drawn by: skadam	App'd:
Code: TIA/EIA-222-F	Date: 06/22/12	Scale: NTS
Path: S:\BAT Engineering\Projects\BTE\Management\84425 Windsor\Engineering\msTower\84425_001_Windsor_CT—Model.eg E-R.dwl		Dwg No. E-1

Feedline Distribution Chart
0' - 101'

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



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Client: Nexlinkgs	Drawn by: skadam	App'd:
Code: TIA/EIA-222-F	Date: 06/22/12	Scale: NTS
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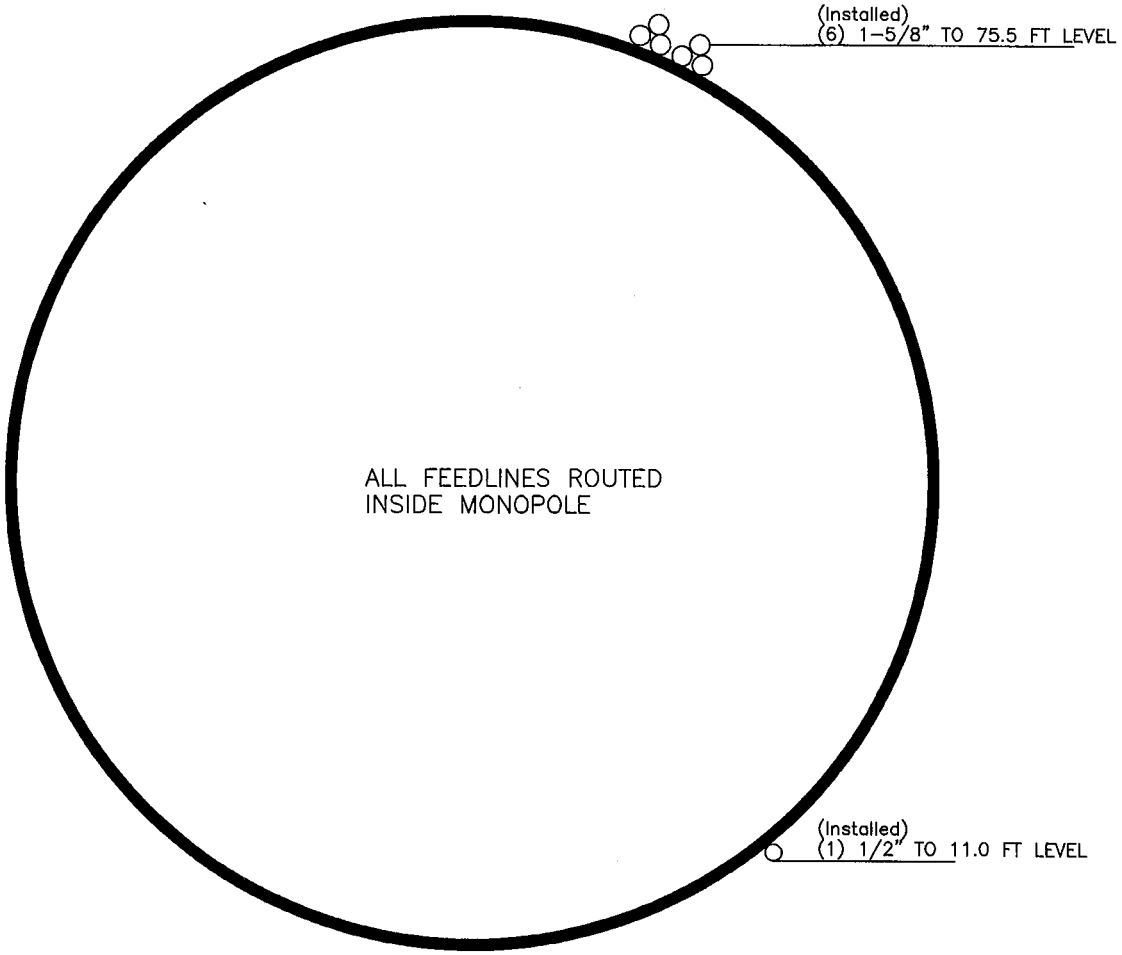


PROJECT NUMBER: 84425.001

APPENDIX B

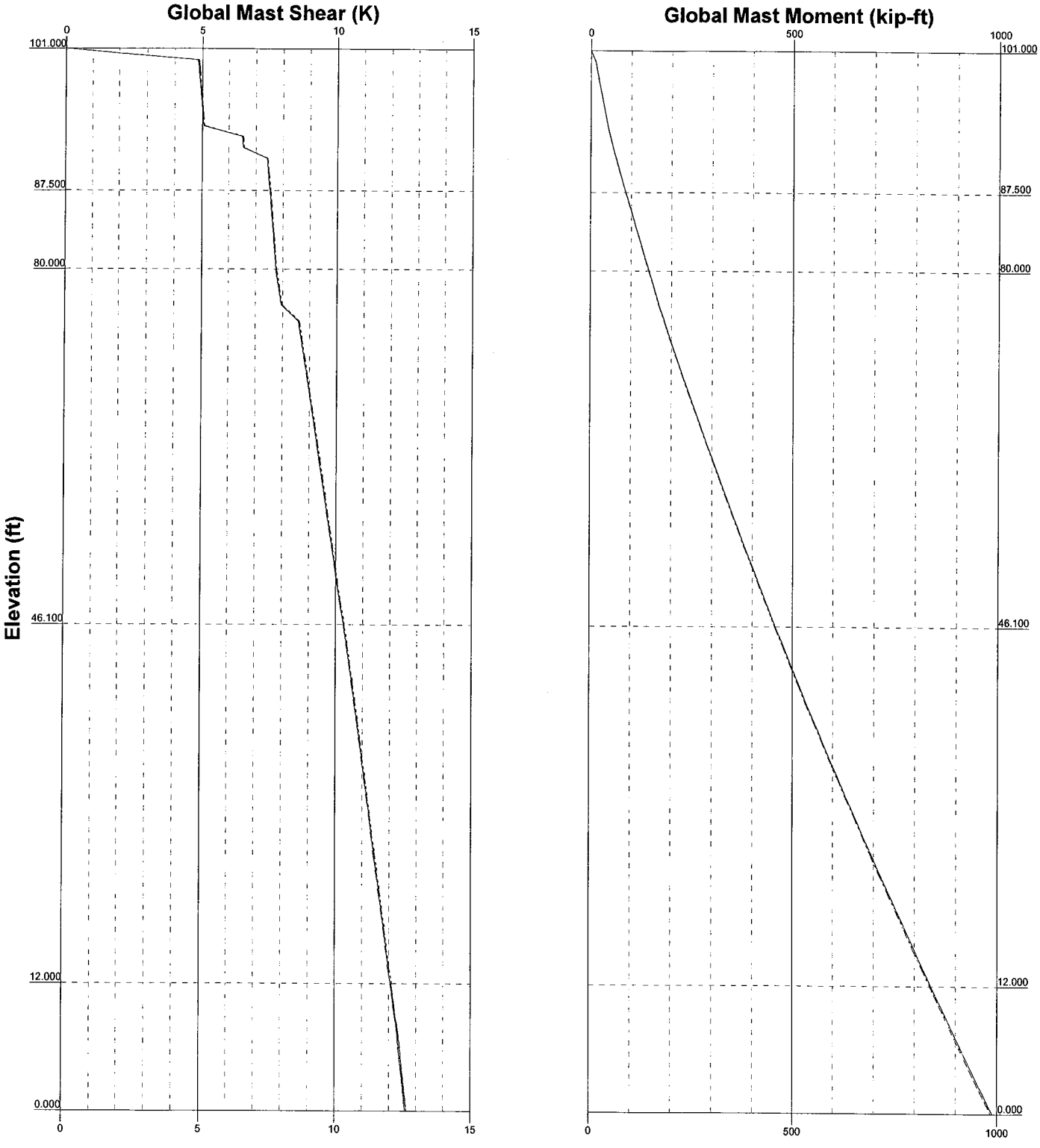
BASE LEVEL DRAWING

TIA/EIA-222-F - 81 mph/38 mph 1.000 in Ice

Vx Vz

Maximum Values

Mx Mz



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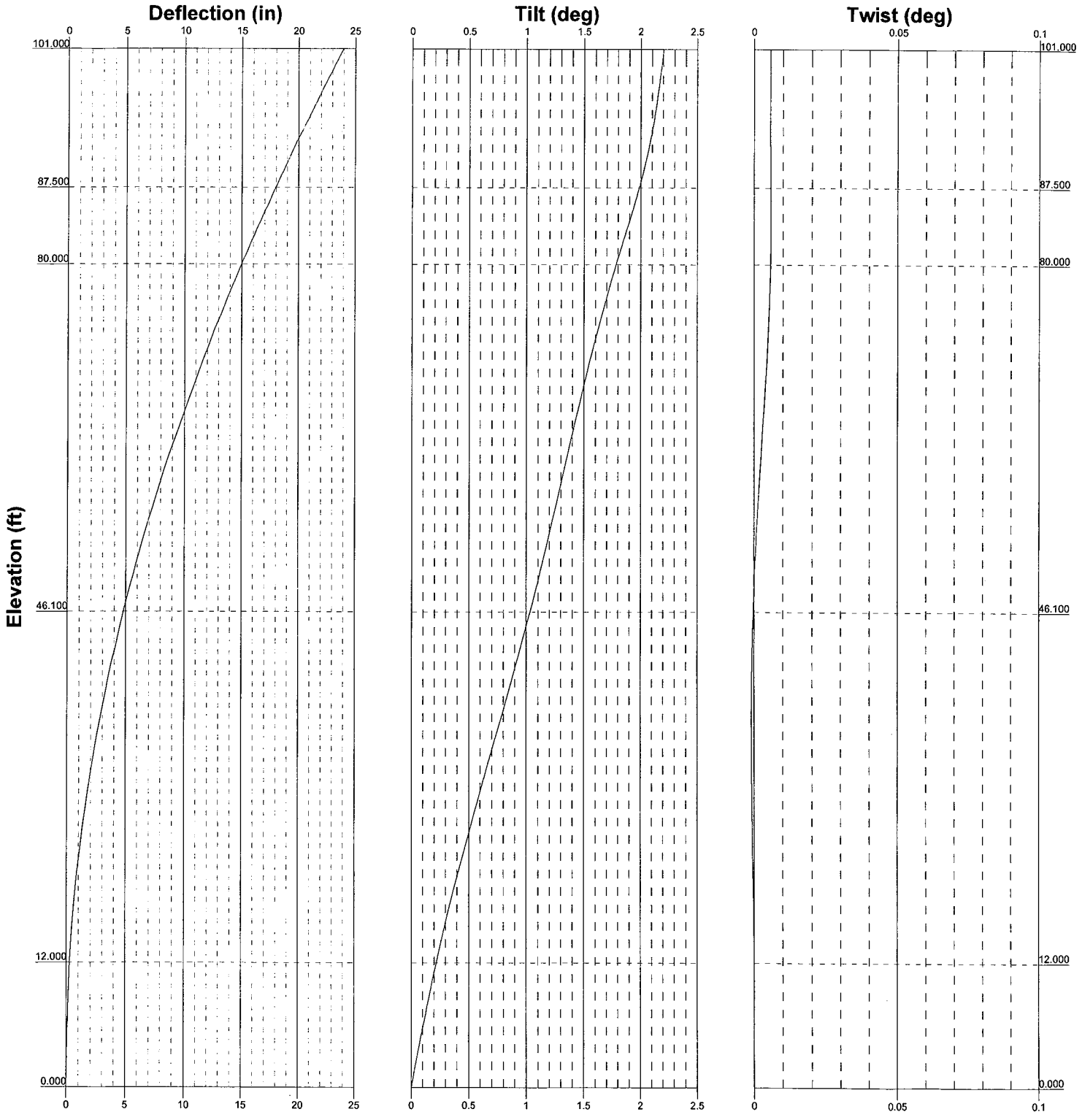
Job: 84425.001- Windsor, CT (Site# CT 1026)		
Project: 101' EEI MP/ AT&T Mobility Co-Locate		
Client: Nexlinkgs	Drawn by: skadam	App'd:
Code: TIA/EIA-222-F	Date: 06/22/12	Scale: NTS
Path: S:\BAT Engineering\Projects\NSTE Management\84425_Windsor_CT_Modified_E-R.ec6		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph **Maximum Values**



B+T Group
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Phone: (918) 587-4630
FAX: (918) 587-4630

Job: 84425.001- Windsor, CT (Site# CT 1026)		
Project: 101' EEI MP/ AT&T Mobility Co-Locate		
Client: Nexlinkgs	Drawn by: skadam	App'd:
Code: TIA/EIA-222-F	Date: 06/22/12	Scale: NTS
Path:		Dwg No. E-5

tnxTower	Job	Page
	84425.001- Windsor, CT (Site# CT 1026)	1 of 15
B+T Group 1717 S.Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	Project 101' EEI MP/ AT&T Mobility Co-Locate	Date 10:10:44 06/22/12
	Client Nexlinkgs	Designed by skadam

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 Hartford County, Connecticut.
Basic wind speed of 81 mph.
Nominal ice thickness of 1.000 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.
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, feedline supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	101.000-87.500	13.500	2.000	18	14.650	16.170	0.188	0.750	A572-65 (65 ksi)
L2	87.500-80.000	9.500	0.000	18	15.570	16.900	0.250	1.000	A572-65 (65 ksi)
L3	80.000-46.100	33.900	2.500	18	16.900	20.730	0.575	2.302	56.6 ksi (57 ksi)
L4	46.100-12.000	36.600	0.000	16	19.297	24.350	0.738	2.950	56.1 ksi (56 ksi)
L5	12.000-0.000	12.000		18	24.350	25.800	0.992	3.968	56.5 ksi (57 ksi)

Tapered Pole Properties

Section	Tip Dia.	Area	I	r	C	I/C	J	It/Q	w	w/t
	in	in^2	in^4	in	in	in^3	in^4	in^2	in	
L1	14.876	8.607	227.445	5.134	7.442	30.561	455.189	4.304	2.248	11.991
	16.419	9.512	306.959	5.674	8.214	37.369	614.321	4.757	2.516	13.418
L2	16.094	12.156	360.450	5.439	7.909	45.572	721.374	6.079	2.300	9.201
	17.161	13.212	462.729	5.911	8.585	53.898	926.068	6.607	2.534	10.138
L3	17.161	29.814	1003.788	5.795	8.585	116.921	2008.896	14.910	1.962	3.409
	21.050	36.809	1889.021	7.155	10.531	179.380	3780.528	18.408	2.636	4.581
L4	20.027	43.669	1900.204	6.607	9.841	193.084	3829.180	21.592	2.372	3.216
	24.827	55.559	3913.329	8.406	12.419	315.121	7885.910	27.471	3.378	4.579
L5	24.726	73.552	5069.921	8.292	12.370	409.863	10146.513	36.783	2.540	2.56
	26.198	78.118	6073.931	8.807	13.106	463.432	12155.854	39.067	2.795	2.817

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 101.000-87.500				1	1	1		
L2 87.500-80.000				1	1	1		
L3 80.000-46.100				1	1	1		
L4 46.100-12.000				1	1	1		
L5 12.000-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		C_AA_A	Weight
				ft			ft^2/ft	klf
1 1/4	C	No	Inside Pole	101.000 - 5.000	12	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
DC/Fiber	C	No	Inside Pole	101.000 - 5.000	3	No Ice	0.000	0.000
(P)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
*****								
7/8	A	No	Inside Pole	91.500 - 5.000	18	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
*****								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1 5/8 (E-Outside)	B	No	CaAa (Out Of Face)	75.500 - 5.000	2	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
						1" Ice	0.398	0.005
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
1 5/8 (E-Outside Shielded)	B	No	CaAa (Out Of Face)	75.500 - 5.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.005
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
*****								
1/2 (E-Outside Shielded)	C	No	Inside Pole	9.000 - 5.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
******								
*****								
MP3-06 (E-Outside)	A	No	CaAa (Out Of Face)	45.400 - 0.000	1	No Ice	0.434	0.000
						1/2" Ice	0.518	0.000
						1" Ice	0.601	0.000
						2" Ice	0.768	0.000
						4" Ice	1.101	0.000
MP3-05 (E-Outside)	A	No	CaAa (Out Of Face)	80.000 - 45.400	1	No Ice	0.348	0.000
						1/2" Ice	0.432	0.000
						1" Ice	0.515	0.000
						2" Ice	0.682	0.000
						4" Ice	1.015	0.000

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	101.000-87.500	A	0.000	0.000	0.000	0.000	0.039
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.117
L2	87.500-80.000	A	0.000	0.000	0.000	0.000	0.073
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.065
L3	80.000-46.100	A	0.000	0.000	0.000	11.809	0.330
		B	0.000	0.000	0.000	11.642	0.183
		C	0.000	0.000	0.000	0.000	0.294
L4	46.100-12.000	A	0.000	0.000	0.000	14.751	0.331
		B	0.000	0.000	0.000	13.504	0.213
		C	0.000	0.000	0.000	0.000	0.296
L5	12.000-0.000	A	0.000	0.000	0.000	5.212	0.068
		B	0.000	0.000	0.000	2.772	0.044
		C	0.000	0.000	0.000	0.000	0.062

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	101.000-87.500	A	1.134	0.000	0.000	0.000	0.000	0.039
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.117
L2	87.500-80.000	A	1.118	0.000	0.000	0.000	0.000	0.073
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.065
L3	80.000-46.100	A	1.080	0.000	0.000	0.000	17.912	0.330
		B		0.000	0.000	0.000	24.346	0.912
		C		0.000	0.000	0.000	0.000	0.294
L4	46.100-12.000	A	1.000	0.000	0.000	0.000	20.890	0.331
		B		0.000	0.000	0.000	28.239	1.058
		C		0.000	0.000	0.000	0.000	0.296
L5	12.000-0.000	A	1.000	0.000	0.000	0.000	7.212	0.068
		B		0.000	0.000	0.000	5.572	0.197
		C		0.000	0.000	0.000	0.000	0.062

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	101.000-87.500	0.000	0.000	0.000	0.000
L2	87.500-80.000	0.000	0.000	0.000	0.000
L3	80.000-46.100	0.314	-0.181	0.495	-0.129
L4	46.100-12.000	0.354	-0.243	0.571	-0.158
L5	12.000-0.000	0.225	-0.364	0.375	-0.351

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 3/4" x 5' (E)	C	None		0.000	104.000	No Ice	0.375	0.375	0.030
						1/2" Ice	0.890	0.890	0.034
						1" Ice	1.356	1.356	0.041
						2" Ice	1.993	1.993	0.066
						4" Ice	3.376	3.376	0.162
*****									
RA21.7770.00 w/ Mount Pipe (E)	C	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice	7.031	5.002	0.060
						1/2" Ice	7.608	5.960	0.112
						1" Ice	8.165	6.747	0.174
						2" Ice	9.310	8.370	0.322
						4" Ice	11.721	11.872	0.746
RA21.7770.00 w/ Mount Pipe (E)	B	From Leg	3.000 0.000	0.000	103.000	No Ice	7.031	5.002	0.060
						1/2" Ice	7.608	5.960	0.112

tnxTower	Job: 84425.001- Windsor, CT (Site# CT 1026)	Page: 5 of 15
B+T Group 1717 S.Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	Project: 101' EEI MP/ AT&T Mobility Co-Locate	Date: 10:10:44 06/22/12
	Client: Nexlinkgs	Designed by: skadam

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
			0.000			1" Ice	8.165	6.747	0.174
						2" Ice	9.310	8.370	0.322
						4" Ice	11.721	11.872	0.746
RA21.7770.00 w/ Mount Pipe (E)	A	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	7.031 7.608 8.165	5.002 5.960 6.747	0.060 0.112 0.174
						2" Ice	9.310	8.370	0.322
						4" Ice	11.721	11.872	0.746
(2) CG-1900W800-FULL-DIN (E)	C	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	1.284 1.438 1.600	0.313 0.410 0.517	0.012 0.019 0.028
						2" Ice	1.949	0.756	0.053
						4" Ice	2.753	1.338	0.133
(2) CG-1900W800-FULL-DIN (E)	B	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	1.284 1.438 1.600	0.313 0.410 0.517	0.012 0.019 0.028
						2" Ice	1.949	0.756	0.053
						4" Ice	2.753	1.338	0.133
(2) CG-1900W800-FULL-DIN (E)	A	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	1.284 1.438 1.600	0.313 0.410 0.517	0.012 0.019 0.028
						2" Ice	1.949	0.756	0.053
						4" Ice	2.753	1.338	0.133
TT19-08BP111-001 (E)	C	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
TT19-08BP111-001 (E)	B	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
TT19-08BP111-001 (E)	A	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	0.636 0.747 0.867	0.516 0.619 0.730	0.016 0.022 0.029
						2" Ice	1.133	0.980	0.049
						4" Ice	1.768	1.582	0.118
Platform Mount [LP 712-1] (E)	C	None		0.000	101.000	No Ice 1/2" Ice 1" Ice	24.530 29.940 35.350	24.530 29.940 35.350	1.335 1.646 1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
Platform Ladder (E)	C	None		0.000	101.000	No Ice 1/2" Ice 1" Ice	8.000 10.000 12.000	8.000 10.000 12.000	0.400 0.700 1.000
						2" Ice	16.000	16.000	1.600
						4" Ice	24.000	24.000	2.800
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	C	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.304 7.479 8.368	0.074 0.136 0.210
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	B	From Leg	3.000 0.000 0.000	0.000	103.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.304 7.479 8.368	0.074 0.136 0.210
						2" Ice	11.031	10.179	0.385

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	13.679	14.024	0.874
(2)	A	From Leg	3.000	0.000	103.000	No Ice	8.498	6.304	0.074
AM-X-CD-16-65-00T-RET			0.000			1/2" Ice	9.149	7.479	0.136
w/ Mount Pipe			0.000			1" Ice	9.767	8.368	0.210
(P)						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
DTMA1819VG12A	C	From Leg	3.000	0.000	103.000	No Ice	1.154	0.445	0.013
(P)			0.000			1/2" Ice	1.305	0.563	0.020
			0.000			1" Ice	1.464	0.689	0.029
						2" Ice	1.809	0.968	0.054
						4" Ice	2.602	1.629	0.133
DTMA1819VG12A	B	From Leg	3.000	0.000	103.000	No Ice	1.154	0.445	0.013
(P)			0.000			1/2" Ice	1.305	0.563	0.020
			0.000			1" Ice	1.464	0.689	0.029
						2" Ice	1.809	0.968	0.054
						4" Ice	2.602	1.629	0.133
DTMA1819VG12A	A	From Leg	3.000	0.000	103.000	No Ice	1.154	0.445	0.013
(P)			0.000			1/2" Ice	1.305	0.563	0.020
			0.000			1" Ice	1.464	0.689	0.029
						2" Ice	1.809	0.968	0.054
						4" Ice	2.602	1.629	0.133
(2) RRU-11	C	From Leg	3.000	0.000	103.000	No Ice	1.912	1.472	0.044
(P)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
(2) RRU-11	B	From Leg	3.000	0.000	103.000	No Ice	1.912	1.472	0.044
(P)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
(2) RRU-11	A	From Leg	3.000	0.000	103.000	No Ice	1.912	1.472	0.044
(P)			0.000			1/2" Ice	2.102	1.645	0.060
			0.000			1" Ice	2.301	1.827	0.078
						2" Ice	2.725	2.218	0.123
						4" Ice	3.676	3.102	0.254
DC6-48-60-18-8F	C	From Leg	3.000	0.000	103.000	No Ice	2.567	4.317	0.019
(P)			0.000			1/2" Ice	2.798	4.596	0.050
			0.000			1" Ice	3.038	4.885	0.085
						2" Ice	3.543	5.488	0.167
						4" Ice	4.658	6.797	0.383
*****									
(2) APX16DWV-16DWVS-C	C	From Leg	3.000	0.000	93.500	No Ice	7.466	3.494	0.061
w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
(2) APX16DWV-16DWVS-C	B	From Leg	3.000	0.000	93.500	No Ice	7.466	3.494	0.061
w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683
(2) APX16DWV-16DWVS-C	A	From Leg	3.000	0.000	93.500	No Ice	7.466	3.494	0.061
w/ Mount Pipe			0.000			1/2" Ice	7.994	4.263	0.108
(E)			0.000			1" Ice	8.518	4.960	0.164
						2" Ice	9.595	6.403	0.298
						4" Ice	11.873	9.490	0.683

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
KRY 112 71/2	C	From Leg	3.000	0.000	93.500	No Ice	0.681	0.510	0.013
(E)			0.000			1/2" Ice	0.802	0.623	0.019
			0.000			1" Ice	0.932	0.744	0.026
						2" Ice	1.219	1.013	0.046
						4" Ice	1.896	1.653	0.114
KRY 112 71/2	B	From Leg	3.000	0.000	93.500	No Ice	0.681	0.510	0.013
(E)			0.000			1/2" Ice	0.802	0.623	0.019
			0.000			1" Ice	0.932	0.744	0.026
						2" Ice	1.219	1.013	0.046
						4" Ice	1.896	1.653	0.114
KRY 112 71/2	A	From Leg	3.000	0.000	93.500	No Ice	0.681	0.510	0.013
(E)			0.000			1/2" Ice	0.802	0.623	0.019
			0.000			1" Ice	0.932	0.744	0.026
						2" Ice	1.219	1.013	0.046
						4" Ice	1.896	1.653	0.114
E15S09P94	C	From Leg	3.000	0.000	93.500	No Ice	0.664	0.367	0.015
(E)			0.000			1/2" Ice	0.778	0.461	0.020
			0.000			1" Ice	0.901	0.564	0.026
						2" Ice	1.172	0.796	0.045
						4" Ice	1.817	1.364	0.108
E15S09P94	B	From Leg	3.000	0.000	93.500	No Ice	0.664	0.367	0.015
(E)			0.000			1/2" Ice	0.778	0.461	0.020
			0.000			1" Ice	0.901	0.564	0.026
						2" Ice	1.172	0.796	0.045
						4" Ice	1.817	1.364	0.108
E15S09P94	A	From Leg	3.000	0.000	93.500	No Ice	0.664	0.367	0.015
(E)			0.000			1/2" Ice	0.778	0.461	0.020
			0.000			1" Ice	0.901	0.564	0.026
						2" Ice	1.172	0.796	0.045
						4" Ice	1.817	1.364	0.108
Platform Mount [LP 303-1]	C	None		0.000	91.500	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
6' x 2" Mount Pipe	C	From Leg	3.000	0.000	91.500	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	B	From Leg	3.000	0.000	91.500	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	91.500	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
						4" Ice	4.702	4.702	0.231
*****									
APX18-206517S-C-A20 w/Mount Pipe	C	From Leg	1.000	0.000	75.500	No Ice	5.404	4.700	0.052
(E)			0.000			1/2" Ice	5.960	5.860	0.094
			0.000			1" Ice	6.481	6.734	0.148
						2" Ice	7.547	8.515	0.280
						4" Ice	9.919	12.277	0.679
APX18-206517S-C-A20	B	From Leg	1.000	0.000	75.500	No Ice	5.404	4.700	0.052

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
w/Mount Pipe			0.000			1/2" Ice	5.960	5.860	0.094
(E)			0.000			1" Ice	6.481	6.734	0.148
						2" Ice	7.547	8.515	0.280
						4" Ice	9.919	12.277	0.679
APX18-206517S-C-A20	A	From Leg	1.000	0.000	75.500	No Ice	5.404	4.700	0.052
w/Mount Pipe			0.000			1/2" Ice	5.960	5.860	0.094
(E)			0.000			1" Ice	6.481	6.734	0.148
						2" Ice	7.547	8.515	0.280
						4" Ice	9.919	12.277	0.679
*****									
Side Arm Mount [SO 701-1]	C	From Leg	0.000	0.000	9.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
GPS_A	C	From Leg	2.000	0.000	11.000	No Ice	0.297	0.297	0.001
(E)			0.000			1/2" Ice	0.374	0.374	0.005
			0.000			1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
**********									
*****									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight K
*****										

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

Comb. No.	Description
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	101 - 87.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-10.112	0.304	-0.187
			Max. Mx	11	-4.420	71.438	0.396
			Max. My	8	-4.413	-0.387	-71.886
			Max. Vy	5	7.425	-71.320	-0.426
			Max. Vx	8	7.461	-0.387	-71.886
			Max. Torque	7			-0.609
L2	87.5 - 80	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-11.023	0.300	-0.199
			Max. Mx	11	-5.110	143.470	0.686
			Max. My	8	-5.104	-0.675	-144.258
			Max. Vy	5	7.735	-143.352	-0.728
			Max. Vx	8	7.771	-0.675	-144.258
			Max. Torque	13			0.608
L3	80 - 46.1	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-17.296	-0.299	-0.561
			Max. Mx	5	-9.659	-430.337	-1.790
			Max. My	8	-9.655	-1.757	-432.322
			Max. Vy	5	10.128	-430.337	-1.790
			Max. Vx	8	10.164	-1.757	-432.322
			Max. Torque	13			0.608
L4	46.1 - 12	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-26.694	-1.184	-1.072
			Max. Mx	5	-17.413	-837.117	-3.025
			Max. My	8	-17.412	-3.058	-840.324
			Max. Vy	5	12.060	-837.117	-3.025
			Max. Vx	8	12.095	-3.058	-840.324

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	13			0.547
L5	12 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-30.606	-1.252	-1.236
			Max. Mx	5	-20.872	-985.063	-3.528
			Max. My	8	-20.872	-3.484	-988.863
			Max. Vy	5	12.600	-985.063	-3.528
			Max. Vx	8	12.646	-3.484	-988.863
			Max. Torque	13			0.538

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	20	30.606	-1.906	-3.300
	Max. H_x	11	20.877	12.592	0.039
	Max. H_z	2	20.877	0.039	12.637
	Max. M_x	2	988.324	0.039	12.637
	Max. M_z	5	985.063	-12.592	-0.039
	Max. Torsion	13	0.524	6.330	10.964
	Min. Vert	1	20.877	0.000	0.000
	Min. H_x	5	20.877	-12.592	-0.039
	Min. H_z	8	20.877	-0.039	-12.637
	Min. M_x	8	-988.863	-0.039	-12.637
	Min. M_z	11	-984.620	12.592	0.039
	Min. Torsion	7	-0.524	-6.330	-10.964

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	20.877	0.000	0.000	0.262	-0.215	0.000
Dead+Wind 0 deg - No Ice	20.877	-0.039	-12.637	-988.324	3.032	-0.466
Dead+Wind 30 deg - No Ice	20.877	6.262	-10.924	-854.257	-489.825	-0.280
Dead+Wind 60 deg - No Ice	20.877	10.885	-6.285	-491.213	-851.499	-0.017
Dead+Wind 90 deg - No Ice	20.877	12.592	0.039	3.528	-985.063	0.250
Dead+Wind 120 deg - No Ice	20.877	10.924	6.353	497.388	-854.743	0.448
Dead+Wind 150 deg - No Ice	20.877	6.330	10.964	858.041	-495.461	0.524
Dead+Wind 180 deg - No Ice	20.877	0.039	12.637	988.863	-3.484	0.459
Dead+Wind 210 deg - No Ice	20.877	-6.262	10.924	854.804	489.377	0.274
Dead+Wind 240 deg - No Ice	20.877	-10.885	6.285	491.757	851.056	0.017
Dead+Wind 270 deg - No Ice	20.877	-12.592	-0.039	-2.989	984.620	-0.244
Dead+Wind 300 deg - No Ice	20.877	-10.924	-6.353	-496.852	854.296	-0.442
Dead+Wind 330 deg - No Ice	20.877	-6.330	-10.964	-857.504	495.010	-0.524
Dead+Ice+Temp	30.606	0.000	0.000	1.236	-1.252	0.000
Dead+Wind 0 deg+Ice+Temp	30.606	-0.011	-3.805	-308.870	-0.492	-0.106
Dead+Wind 30 deg+Ice+Temp	30.606	1.886	-3.289	-266.915	-155.212	-0.054
Dead+Wind 60 deg+Ice+Temp	30.606	3.278	-1.893	-153.098	-268.689	0.012
Dead+Wind 90 deg+Ice+Temp	30.606	3.792	0.011	2.086	-310.519	0.075
Dead+Wind 120 deg+Ice+Temp	30.606	3.289	1.912	157.054	-269.493	0.118
Dead+Wind 150 deg+Ice+Temp	30.606	1.906	3.300	270.283	-156.604	0.129
Dead+Wind 180 deg+Ice+Temp	30.606	0.011	3.805	311.434	-2.100	0.105

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 210 deg+Ice+Temp	30.606	-1.886	3.289	269.480	152.620	0.054
Dead+Wind 240 deg+Ice+Temp	30.606	-3.278	1.893	155.662	266.099	-0.012
Dead+Wind 270 deg+Ice+Temp	30.606	-3.792	-0.011	0.478	307.929	-0.075
Dead+Wind 300 deg+Ice+Temp	30.606	-3.289	-1.912	-154.490	266.902	-0.118
Dead+Wind 330 deg+Ice+Temp	30.606	-1.906	-3.300	-267.719	154.012	-0.129
Dead+Wind 0 deg - Service	20.877	-0.015	-4.875	-381.588	1.036	-0.181
Dead+Wind 30 deg - Service	20.877	2.416	-4.215	-329.801	-189.336	-0.108
Dead+Wind 60 deg - Service	20.877	4.199	-2.424	-189.569	-329.036	-0.007
Dead+Wind 90 deg - Service	20.877	4.858	0.015	1.531	-380.629	0.097
Dead+Wind 120 deg - Service	20.877	4.215	2.451	192.293	-330.295	0.174
Dead+Wind 150 deg - Service	20.877	2.442	4.230	331.603	-191.517	0.204
Dead+Wind 180 deg - Service	20.877	0.015	4.875	382.132	-1.481	0.180
Dead+Wind 210 deg - Service	20.877	-2.416	4.215	330.346	188.892	0.108
Dead+Wind 240 deg - Service	20.877	-4.199	2.424	190.114	328.593	0.007
Dead+Wind 270 deg - Service	20.877	-4.858	-0.015	-0.987	380.185	-0.096
Dead+Wind 300 deg - Service	20.877	-4.215	-2.451	-191.749	329.851	-0.173
Dead+Wind 330 deg - Service	20.877	-2.442	-4.230	-331.059	191.072	-0.204

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-20.877	0.000	0.000	20.877	0.000	0.000%
2	-0.039	-20.877	-12.637	0.039	20.877	12.637	0.000%
3	6.262	-20.877	-10.924	-6.262	20.877	10.924	0.000%
4	10.885	-20.877	-6.285	-10.885	20.877	6.285	0.000%
5	12.592	-20.877	0.039	-12.592	20.877	-0.039	0.000%
6	10.924	-20.877	6.353	-10.924	20.877	-6.353	0.000%
7	6.330	-20.877	10.964	-6.330	20.877	-10.964	0.000%
8	0.039	-20.877	12.637	-0.039	20.877	-12.637	0.000%
9	-6.262	-20.877	10.924	6.262	20.877	-10.924	0.000%
10	-10.885	-20.877	6.285	10.885	20.877	-6.285	0.000%
11	-12.592	-20.877	-0.039	12.592	20.877	0.039	0.000%
12	-10.924	-20.877	-6.353	10.924	20.877	6.353	0.000%
13	-6.330	-20.877	-10.964	6.330	20.877	10.964	0.000%
14	0.000	-30.606	0.000	-0.000	30.606	-0.000	0.000%
15	-0.011	-30.606	-3.805	0.011	30.606	3.805	0.000%
16	1.886	-30.606	-3.289	-1.886	30.606	3.289	0.000%
17	3.278	-30.606	-1.893	-3.278	30.606	1.893	0.000%
18	3.792	-30.606	0.011	-3.792	30.606	-0.011	0.000%
19	3.289	-30.606	1.912	-3.289	30.606	-1.912	0.000%
20	1.906	-30.606	3.300	-1.906	30.606	-3.300	0.000%
21	0.011	-30.606	3.805	-0.011	30.606	-3.805	0.000%
22	-1.886	-30.606	3.289	1.886	30.606	-3.289	0.000%
23	-3.278	-30.606	1.893	3.278	30.606	-1.893	0.000%
24	-3.792	-30.606	-0.011	3.792	30.606	0.011	0.000%
25	-3.289	-30.606	-1.912	3.289	30.606	1.912	0.000%
26	-1.906	-30.606	-3.300	1.906	30.606	3.300	0.000%
27	-0.015	-20.877	-4.875	0.015	20.877	4.875	0.000%
28	2.416	-20.877	-4.215	-2.416	20.877	4.215	0.000%
29	4.199	-20.877	-2.424	-4.199	20.877	2.424	0.000%
30	4.858	-20.877	0.015	-4.858	20.877	-0.015	0.000%
31	4.215	-20.877	2.451	-4.215	20.877	-2.451	0.000%
32	2.442	-20.877	4.230	-2.442	20.877	-4.230	0.000%
33	0.015	-20.877	4.875	-0.015	20.877	-4.875	0.000%
34	-2.416	-20.877	4.215	2.416	20.877	-4.215	0.000%
35	-4.199	-20.877	2.424	4.199	20.877	-2.424	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
36	-4.858	-20.877	-0.015	4.858	20.877	0.015	0.000%
37	-4.215	-20.877	-2.451	4.215	20.877	2.451	0.000%
38	-2.442	-20.877	-4.230	2.442	20.877	4.230	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	5	0.00000001	0.00005898
3	Yes	5	0.00000001	0.00086560
4	Yes	5	0.00000001	0.00088016
5	Yes	4	0.00000001	0.00091517
6	Yes	5	0.00000001	0.00092462
7	Yes	5	0.00000001	0.00086687
8	Yes	4	0.00000001	0.00099457
9	Yes	5	0.00000001	0.00089838
10	Yes	5	0.00000001	0.00088080
11	Yes	4	0.00000001	0.00062264
12	Yes	5	0.00000001	0.00086881
13	Yes	5	0.00000001	0.00092957
14	Yes	4	0.00000001	0.00001391
15	Yes	5	0.00000001	0.00025534
16	Yes	5	0.00000001	0.00039720
17	Yes	5	0.00000001	0.00039835
18	Yes	5	0.00000001	0.00025572
19	Yes	5	0.00000001	0.00041411
20	Yes	5	0.00000001	0.00040330
21	Yes	5	0.00000001	0.00025735
22	Yes	5	0.00000001	0.00040460
23	Yes	5	0.00000001	0.00040217
24	Yes	5	0.00000001	0.00025439
25	Yes	5	0.00000001	0.00039666
26	Yes	5	0.00000001	0.00040851
27	Yes	4	0.00000001	0.00024885
28	Yes	5	0.00000001	0.00007796
29	Yes	5	0.00000001	0.00008071
30	Yes	4	0.00000001	0.00016993
31	Yes	5	0.00000001	0.00008879
32	Yes	5	0.00000001	0.00007760
33	Yes	4	0.00000001	0.00022411
34	Yes	5	0.00000001	0.00008440
35	Yes	5	0.00000001	0.00008090
36	Yes	4	0.00000001	0.00014795
37	Yes	5	0.00000001	0.00007780
38	Yes	5	0.00000001	0.00008972

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 87.5	23.979	32	2.208	0.009
L2	89.5 - 80	18.818	32	2.036	0.005
L3	80 - 46.1	14.984	32	1.783	0.003
L4	48.6 - 12	5.358	32	1.090	0.001
L5	12 - 0	0.272	32	0.217	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.000	Lighting Rod 3/4" x 5'	32	23.979	2.208	0.009	5104
103.000	RA21.7770.00 w/ Mount Pipe	32	23.979	2.208	0.009	5104
101.000	Platform Mount [LP 712-1]	32	23.979	2.208	0.009	5104
93.500	(2) APX16DWV-16DWVS-C w/ Mount Pipe	32	20.569	2.110	0.006	3406
91.500	Platform Mount [LP 303-1]	32	19.685	2.076	0.005	2747
75.500	APX18-206517S-C-A20 w/Mount Pipe	32	13.319	1.667	0.002	2586
11.000	GPS_A	32	0.231	0.198	0.000	2557
9.000	Side Arm Mount [SO 701-1]	32	0.162	0.159	0.000	3019

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 87.5	61.918	7	5.707	0.022
L2	89.5 - 80	48.608	7	5.262	0.012
L3	80 - 46.1	38.716	7	4.610	0.008
L4	48.6 - 12	13.854	7	2.820	0.003
L5	12 - 0	0.705	7	0.562	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.000	Lighting Rod 3/4" x 5'	7	61.918	5.707	0.022	2012
103.000	RA21.7770.00 w/ Mount Pipe	7	61.918	5.707	0.022	2012
101.000	Platform Mount [LP 712-1]	7	61.918	5.707	0.022	2012
93.500	(2) APX16DWV-16DWVS-C w/ Mount Pipe	7	53.122	5.455	0.015	1342
91.500	Platform Mount [LP 303-1]	7	50.842	5.366	0.014	1082
75.500	APX18-206517S-C-A20 w/Mount Pipe	7	34.418	4.310	0.006	1013
11.000	GPS_A	7	0.597	0.511	0.000	989
9.000	Side Arm Mount [SO 701-1]	7	0.420	0.412	0.000	1167

tnxTower	Job	Page
	84425.001- Windsor, CT (Site# CT 1026)	14 of 15
B+T Group 1717 S.Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 587-4630	Project 101' EEI MP/ AT&T Mobility Co-Locate	Date 10:10:44 06/22/12
	Client Nexlinkgs	Designed by skadam

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
L1	101 - 87.5 (1)	TP16.17x14.65x0.188	13.500	0.000	0.0	39.000	9.378	-4.410	365.725	0.012
L2	87.5 - 80 (2)	TP16.9x15.57x0.25	9.500	0.000	0.0	39.000	13.212	-5.101	515.259	0.010
L3	80 - 46.1 (3)	TP20.73x16.9x0.575	33.900	0.000	0.0	33.960	36.293	-9.653	1232.510	0.008
L4	46.1 - 12 (4)	TP24.35x19.297x0.738	36.600	0.000	0.0	33.660	55.559	-17.412	1870.100	0.009
L5	12 - 0 (5)	TP25.8x24.35x0.992	12.000	0.000	0.0	33.900	78.118	-20.872	2648.210	0.008

Pole Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		kip-ft	ksi	ksi		kip-ft	ksi	ksi	
L1	101 - 87.5 (1)	TP16.17x14.65x0.188	72.088	23.820	39.000	0.611	0.000	0.000	39.000	0.000
L2	87.5 - 80 (2)	TP16.9x15.57x0.25	144.630	32.201	39.000	0.826	0.000	0.000	39.000	0.000
L3	80 - 46.1 (3)	TP20.73x16.9x0.575	433.309	29.829	33.960	0.878	0.000	0.000	33.960	0.000
L4	46.1 - 12 (4)	TP24.35x19.297x0.738	842.042	32.065	33.660	0.953	0.000	0.000	33.660	0.000
L5	12 - 0 (5)	TP25.8x24.35x0.992	990.817	25.656	33.900	0.757	0.000	0.000	33.900	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V	Actual f_v	Allow. F_v	Ratio $\frac{f_v}{F_v}$	Actual T	Actual f_{vt}	Allow. F_{vt}	Ratio $\frac{f_{vt}}{F_{vt}}$
	ft		K	ksi	ksi		kip-ft	ksi	ksi	
L1	101 - 87.5 (1)	TP16.17x14.65x0.188	7.479	0.798	26.000	0.061	0.608	0.098	26.000	0.004
L2	87.5 - 80 (2)	TP16.9x15.57x0.25	7.789	0.590	26.000	0.045	0.608	0.066	26.000	0.003
L3	80 - 46.1 (3)	TP20.73x16.9x0.575	10.183	0.281	22.640	0.025	0.555	0.018	22.640	0.001
L4	46.1 - 12 (4)	TP24.35x19.297x0.738	12.112	0.218	22.440	0.020	0.476	0.009	22.440	0.000
L5	12 - 0 (5)	TP25.8x24.35x0.992	12.668	0.162	22.600	0.014	0.526	0.006	22.600	0.000

Pole Interaction Design Data

Section No.	Elevation	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
	ft								
L1	101 - 87.5 (1)	0.012	0.611	0.000	0.061	0.004	0.624 ✓	1.333	H1-3+VT ✓
L2	87.5 - 80 (2)	0.010	0.826	0.000	0.045	0.003	0.836 ✓	1.333	H1-3+VT ✓
L3	80 - 46.1 (3)	0.008	0.878	0.000	0.025	0.001	0.886 ✓	1.333	H1-3+VT ✓

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
L4	46.1 - 12 (4)	0.009	0.953	0.000	0.020	0.000	0.962 ✔	1.333	H1-3+VT ✔
L5	12 - 0 (5)	0.008	0.757	0.000	0.014	0.000	0.765 ✔	1.333	H1-3+VT ✔

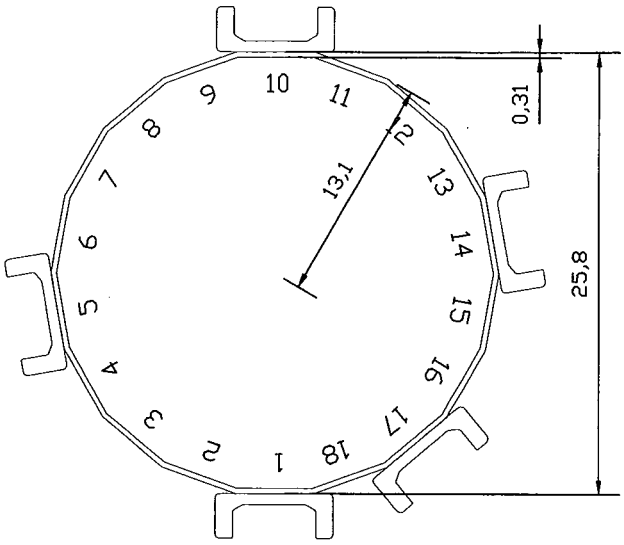
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	101 - 87.5	Pole	TP16.17x14.65x0.188	1	-4.410	487.511	46.8	Pass
L2	87.5 - 80	Pole	TP16.9x15.57x0.25	2	-5.101	686.840	62.7	Pass
L3	80 - 46.1	Pole	TP20.73x16.9x0.575	3	-9.653	1642.936	66.5	Pass
L4	46.1 - 12	Pole	TP24.35x19.297x0.738	4	-17.412	2492.843	72.2	Pass
L5	12 - 0	Pole	TP25.8x24.35x0.992	5	-20.872	3530.064	57.4	Pass
							Summary	
						Pole (L4)	72.2	Pass
						RATING =	**72.2**	**Pass**

Program Version 6.0.4.0 - 1/27/2012

APPENDIX C

ADDITIONAL CALCULATIONS



Section 0'-12'

---------- REGIONS ----------

Area: 67.7126

Perimeter: 271.0432

Bounding Box:

Lower Bound: X= -16.941 Y= -14.1784

Upper Bound: X= 14.713 Y= 16.8336

Centroid: X= -0 Y= 0

Moments of inertia: X= 6386.0058 Y= 5957.8022

Products of inertia:

XY: -136.7441

Radii of gyration: X= 9.7114 Y= 9.3801

PROJECT **84425.001 - Windsor, CT**

SUBJECT **Bolted Channel MOI - Equiv Thickness Calc**

DATE **06/22/12** PAGE 1 OF 1

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Modified Pole Rev F_Ver_1.00_030811_0'-12.0'.xlsx SSK

Elevation: .00 ft to 12.00 ft

MP3 and Pole Information:

Applied Moment	990.8 k-ft	
Combined MOI	5957.8 in^4	
MP3 Type	MP3-06	
MP3 Grade	65.00 ksi	
MP3 Ultimate Stress	80.00 ksi	
Pole Diameter	25.80 in	
Pole Fb	39.00 ksi	No 1/3 Increase
Bolt Spacing	24.00 in	
Hole Size	1	
k	.80 in	

MP3 Compression Analysis:

Ybar (MP3)	13.83 in		
S (MP3)	430.79 in^3		
fb (MP3)	27.60 ksi		
ry	2.4900 in		
kl/r	7.7108		
Cc	93.8441		
Fa	50.89 ksi	Unity% =	54.2 %

MP3 Tension Analysis:

Ag	8.47 in^2		
An	7.83 in^2		
U	0.976		
Ae	7.64 in^2		
Ta (Yielding)	440.44 k		
Ta (Rupture)	407.58 k		
Ft (Equiv)	48.12 ksi	Unity% =	57.4 %

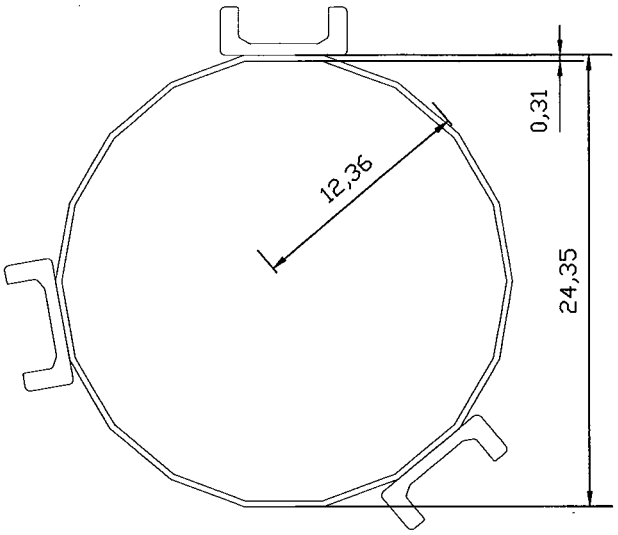
Pole Analysis:

Ybar (Pole)	13.10 in		
S (Pole)	454.79 in^3		
fb (Pole)	26.14 ksi		
Fb (Pole)	52.00 ksi	Unity% =	50.3 %

Equivalent Thickness:

ro	12.90 in	
ri	11.91 in	
teq	**.9921 in**	**Adjust Fy in Risa such that Bending Unity% Matches**

57.4 %



Section 12'-46.1'

---------- REGIONS ----------

Area: 49.3012
Perimeter: 218.1372
Bounding Box:
Lower Bound: X= -14.3416 Y= -13.5658
Upper Bound: X= 13.1342 Y= 14.645
Centroid: X= 0 Y= 0
Moments of inertia: X= 4175.0714 Y= 3816.889
Products of inertia:
XY: -447.8282
Radii of gyration: X= 9.2024 Y= 8.7989

PROJECT **84425.001 - Windsor, CT**

SUBJECT **Bolted Channel MOI - Equiv Thickness Calc**

DATE **06/22/12** PAGE 1 OF 1

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Modified Pole Rev F_Ver_1.00_030811_12.0'-46.1'.xlsx SSK

Elevation: 12.00 ft to 46.10 ft

MP3 and Pole Information:

Applied Moment	842.0 k-ft	
Combined MOI	3816.9 in^4	
MP3 Type	MP3-06	
MP3 Grade	65.00 ksi	
MP3 Ultimate Stress	80.00 ksi	
Pole Diameter	24.35 in	
Pole Fb	39.00 ksi	No 1/3 Increase
Bolt Spacing	24.00 in	
Hole Size	1	
k	.80 in	

MP3 Compression Analysis:

Ybar (MP3)	13.11 in		
S (MP3)	291.26 in^3		
fb (MP3)	34.69 ksi		
ry	2.4900 in		
kl/r	7.7108		
Cc	93.8441		
Fa	50.89 ksi	Unity% =	68.2 %

MP3 Tension Analysis:

Ag	8.47 in^2		
An	7.83 in^2		
U	0.976		
Ae	7.64 in^2		
Ta (Yielding)	440.44 k		
Ta (Rupture)	407.58 k		
Ft (Equiv)	48.12 ksi	Unity% =	72.1 %

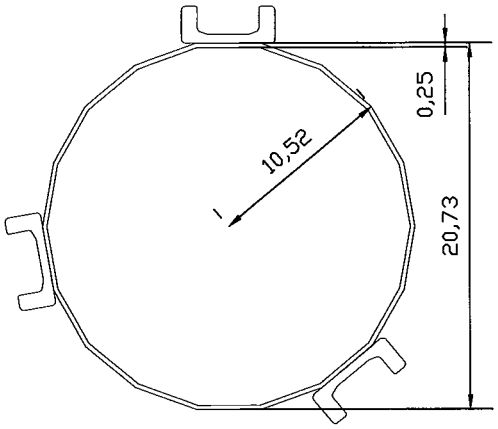
Pole Analysis:

Ybar (Pole)	12.36 in		
S (Pole)	308.81 in^3		
fb (Pole)	32.72 ksi		
Fb (Pole)	52.00 ksi	Unity% =	62.9 %

Equivalent Thickness:

ro	12.18 in	
ri	11.44 in	
teq	**.7376 in**	**Adjust Fy in Risa such that Bending Unity% Matches**

72.1 %



Section 46.1'-80.0'

---------- REGIONS ----------

Area: 33.1418
Perimeter: 181.313
Bounding Box:
Lower Bound: X= -12.0433 Y= -11.2718
Upper Bound: X= 11.1728 Y= 12.3408
Centroid: X= -0 Y= 0
Moments of inertia: X= 2024.4629 Y= 1851.5187
Products of inertia:
XY: -216.6083
Radii of gyration: X= 7.8157 Y= 7.4744

PROJECT **84425.001 - Windsor, CT**

SUBJECT **Bolted Channel MOI - Equiv Thickness Calc**

DATE **06/22/12** PAGE 1 OF 1

B&T Engineering, Inc.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Modified Pole Rev F_Ver_1.00_030811_46.1'-80.0'.xlsx SSK

Elevation: 46.10 ft to 80.00 ft

MP3 and Pole Information:

Applied Moment	433.3 k-ft	
Combined MOI	1851.5 in^4	
MP3 Type	MP3-05	
MP3 Grade	65.00 ksi	
MP3 Ultimate Stress	80.00 ksi	
Pole Diameter	20.73 in	
Pole Fb	39.00 ksi	No 1/3 Increase
Bolt Spacing	18.00 in	
Hole Size	1	
k	.80 in	

MP3 Compression Analysis:

Ybar (MP3)	11.16 in		
S (MP3)	165.98 in^3		
fb (MP3)	31.33 ksi		
ry	1.9180 in		
kl/r	7.5078		
Cc	93.8441		
Fa	50.92 ksi	Unity% =	61.5 %

MP3 Tension Analysis:

Ag	5.65 in^2		
An	5.15 in^2		
U	0.971		
Ae	5.00 in^2		
Ta (Yielding)	293.80 k		
Ta (Rupture)	266.70 k		
Ft (Equiv)	47.20 ksi	Unity% =	66.4 %

Pole Analysis:

Ybar (Pole)	10.52 in		
S (Pole)	176.00 in^3		
fb (Pole)	29.54 ksi		
Fb (Pole)	52.00 ksi	Unity% =	56.8 %

Equivalent Thickness:

ro	10.37 in	
ri	9.79 in	
teq	**.5754 in**	**Adjust Fy in Risa such that Bending Unity% Matches**

66.4 %

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *CT1026*
Site Name: *Windsor, CT*
App #:

Anchor Rod Data		
Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	53	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	48.5	in
Thick:	2.5	in
Grade:	60	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Stiffened	
Weld Type:	Fillet	**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.4375	in
Fillet V. Weld:	0.25	in
Width:	12	in
Height:	48	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	25.8	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	991	ft-kips
Unfactored Axial, P:	13	kips
Unfactored Shear, V:	12	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	110.6 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	56.7% Pass

Base Plate Results

Base Plate Stress:	Shear Check Only
Allowable PL Bending Stress:	Base plate check on
Base Plate Stress Ratio:	next sheet

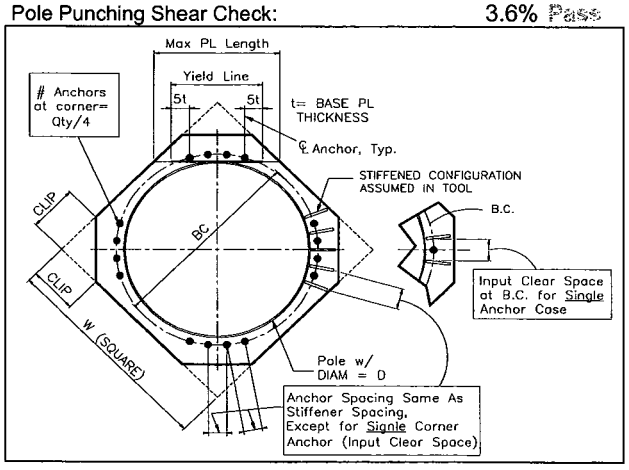
PL Ref. Data
Yield Line (in):
N/A, Roark
Max PL Length:
42.79

Stiffener Results

Horizontal Weld :
Vertical Weld: Stiffner Check on next
Plate Flex+Shear, fb/Fb+(fv/Fv)^2: sheet
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:
Plate Comp. (AISC Bracket):

Pole Results

Pole Punching Shear Check: 3.6% Pass



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

Analysis date: 6/22/2012

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

TIA Rev F

Site Data

BU#: *CT1026*
Site Name: *Windsor, CT*
App #:

Pole Manufacturer:	*Other*

Reactions		
Moment:	991	ft-kips
Axial:	13	kips
Shear:	12	kips

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

Anchor Rod Data		
Qty:	4	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	53	in

Plate Data		
Diam:	53	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	20.47	in

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Groove	
Groove Depth:	0.4375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.4375	<-- Disregard
Fillet V. Weld:	0.25	in
Width:	12	in
Height:	48	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi
Clear Space between Stiffeners (b):	20	in

Pole Data		
Diam:	25.8	in
Thick:	0.3125	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	

Anchor Rod Results

Maximum Rod Tension:	221.1	Kips
Anchor rod tension on the previous page		

Stiffened
Service, ASD
Fty*ASIF

Base Plate Results — Flexural Check

Base Plate Stress:	32.0	ksi
Allowable Plate Stress:	60.0	ksi
Base Plate Stress Ratio:	53.4%	Pass

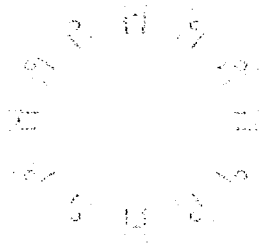
Stiffened
Service, ASD
0.75*Fy*ASIF
Y.L. Length:
N/A, Roark

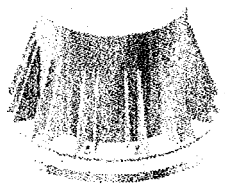
Stiffener Results

Horizontal Weld :	70.0%	Pass
Vertical Weld:	31.0%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	4.0%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	30.8%	Pass
Plate Comp. (AISC Bracket):	30.7%	Pass

Pole Results

Pole Punching Shear Check:	5.2%	Pass

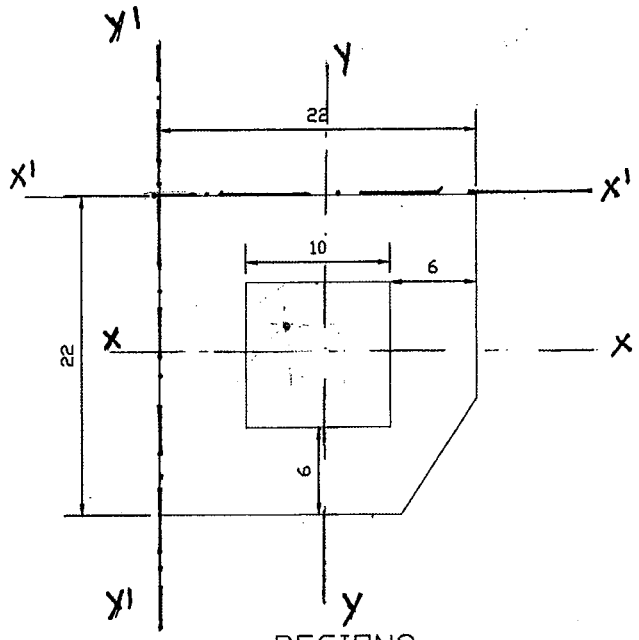




* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

Analysis Date: 6/22/2012



---------- REGIONS ----------

Area: 363

Perimeter: 124.3188

Bounding Box:

Lower Bound: X= -11 Y= -11

Upper Bound: X= 11 Y= 11

Centroid: X= -0.5351 Y= 0.4821

Moments of inertia: X= 17155 Y= 16859.0313

Products of inertia:

XY: 1594.25

Radii of gyration: X= 6.8745 Y= 6.815

PROJECT 84425.001 - Windsor

SUBJECT Check for Overturning.

DATE 9/21/12 PAGE 1 OF 1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Overturning check :-

Overturning Moment = 991 K-ft + 13 X 3 = 1030 K-ft

Resisting Moment => (About Y'-Y' direction)

Weight of Existing Concrete = $1000 \times 0.15 = 150^{K}$

Weight of concrete collar = $368\ ft^2 \times 8\ ft \times 0.15\ K/ft^3 = 163.3^{K}$

Axial Force = 21^{K}

$$M_R = \frac{150 \times 11 + 21 \times 11}{1.5} + 163.3 \times (11 - 0.5351) = 2593.3\ K\text{-}ft$$

$$\text{Overturning capacity} = \frac{M_{OT}}{M_R} = \frac{1030}{2593.3} \times 100 = 39.7\ \%$$

Resisting Moment (About X'-X' direction)

$$M_R = \frac{150 \times 11 + 21 \times 11}{1.5} + 163.3 \times (11 - 0.4821) = 2349.05\ K\text{-}ft$$

$$\text{Overturning capacity} = \frac{M_{OT}}{M_R} = \frac{1030}{2349.05} = 42.9\ \%$$

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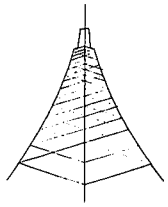


Letter of Explanation (LOE)
MUST be attached to any Structural Analysis

Site Name **Windsor**
Site Number **59344-A**
PE of Record **Chad E. Tuttle, P.E.**
COA: 23924 Exp: 1/31/2013

ALL STRUCTURES	Statement in COL A is Correct	from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Structure Analyzed to F Code	X								
Note: ALL G analyses MUST be justified. A simple notation of jurisdiction requirement will suffice. F BUILT TOWERS in G Code jurisdictions MUST Have the new "5% Grace" Test Applied.G to be applied ONLY where this is exceeded. This 5% test applies to "like for like" only									
Guy Tensions Adjusted Within Code to Find Optimum tension / Minimum Reinforcement (Applies to Guyed Tower Failures Only). Note : AT&T requires a pulse chart for altered Tensions			X						
Antenna Azimuths Inputted Per AT&T Information. NOTE that new antennas should be calculated at 0 degrees to allow flexibility.	X								
All Yield Stresses > = 50 ksi (legs)			X		Monopole; Shaft = 65 ksi				
All Yield Stresses > = 36 ksi (Diagonals and Horizontals))			X		Monopole				
Structures Designated Class II (G Only)			X						
Exposure B Rating Used (Topography)			X						
K value for Slenderness ratio < 1.0			X		Monopole				
Shielding of All Appurtenances Used when Appropriate PER 2.6.9.4 (G Code Only)			X						
0.75 Reduction "Shape" Factor (Figure 2.6) for platform mounts, 0.8 for T-Boom Mounts Used (G Only)			X						
Pipes and round Members have 1.0 Drag Factors. Note if Pipe is attached to flat antenna, these must be considered separately if differing Drag factors are Used		X			In compliance with the TIA-222-F Table 3				
Are Tower Diagonals Designed as "Tension Only"			X		Monopole				

MODIFICATION SECTION	Statement in COL A is Correct	Deviation from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Guyed									
Guyed Only: Reinforcement Recommendation accompanies Optimum Guy Tensioning Scenario.									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member									
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Self Supporting									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member									
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Monopole									
Compression Collars									
NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.									
Foundation									
Guyed Anchor Failure: Berm Solution									
SS Foundation Pad and Pier Failure Berm									
SS Foundation Caisson / Concrete Cap									
Monopole: Cap									

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS	
SITE ADDRESS:	419 BROAD STREET WINDSOR, CT 06095	
LATITUDE:	41.84588 N	41° 50' 45.1" N
LONGITUDE:	72.64614 W	72° 38' 46.1" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES	
CURRENT USE:	TELECOMMUNICATIONS FACILITY	
PROPOSED USE:	TELECOMMUNICATIONS FACILITY	

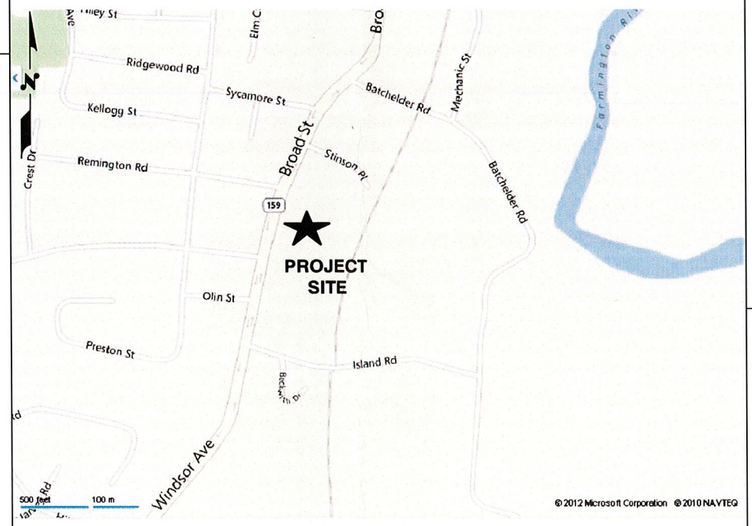
SITE NUMBER: CT1026
SITE NAME: WINDSOR

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD 0.3 MI. TURN LEFT ONTO CAPITAL BLVD 0.3 MI. TURN LEFT ONTO WEST ST 0.2 MI. TURN LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD 14.3 MI. TAKE EXIT 36 FOR CT-178/PARK AVE TOWARD BLOOMFIELD 0.2 MI. TURN RIGHT ONTO CT-178 E/PARK AVE 0.7 MI. TURN LEFT ONTO CT-159 N/WINDSOR AVE. CONTINUE TO FOLLOW CT-159 N. DESTINATION WILL BE ON THE 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.

CALL

BEFORE YOU DIG

CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

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STATE OF CONNECTICUT
DANIEL P. HAMM
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LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1026.01	T-1	2

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.

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 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 SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER

ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – NEXLINK
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. 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.

9. 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.

10. 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.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. 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.

18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
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.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ'D	REQUIRED		

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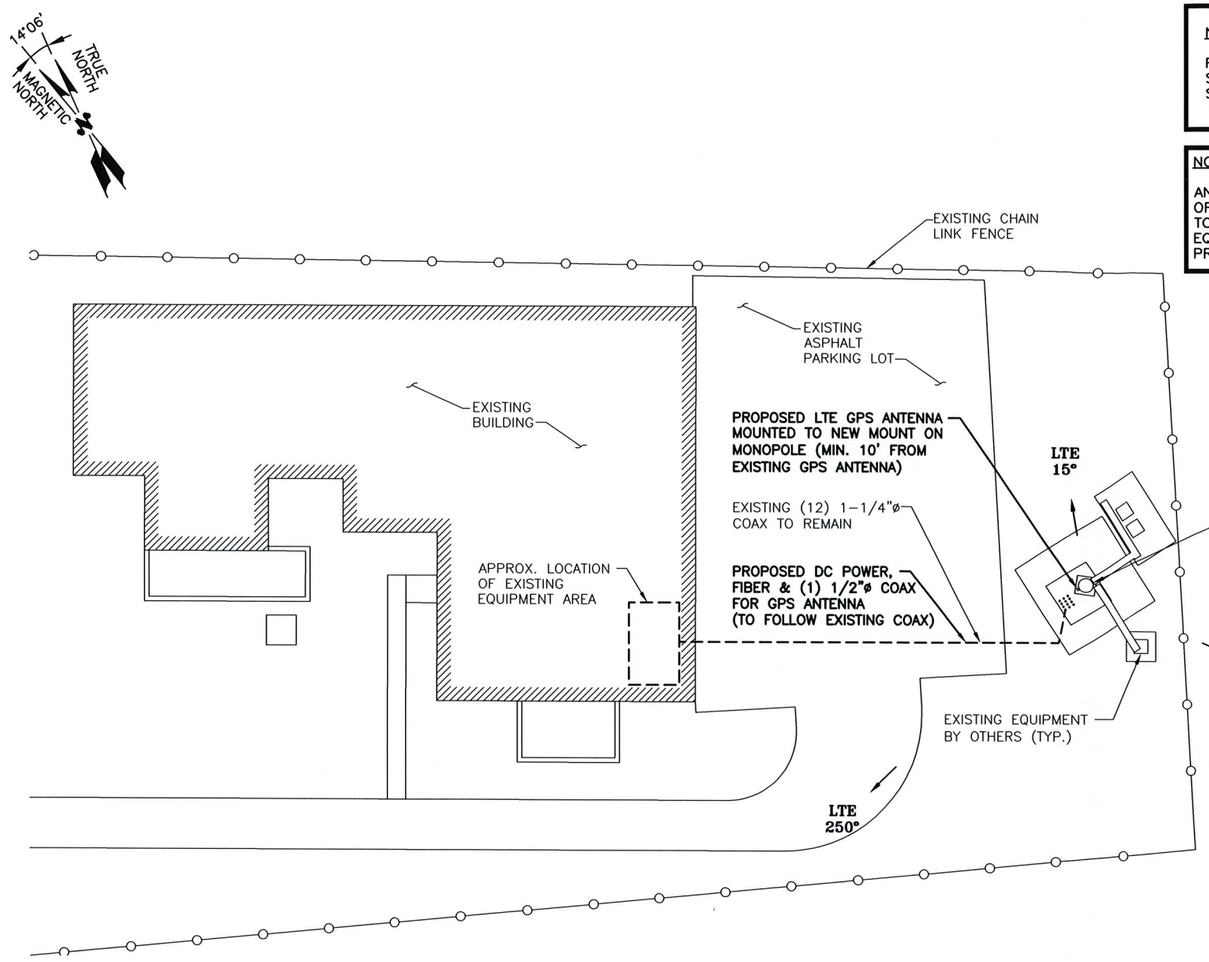
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: SF

STATE OF CONNECTICUT · DANIEL P. HARRIS · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES (LTE)

JOB NUMBER	DRAWING NUMBER	REV
26.01	GN-1	2



NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

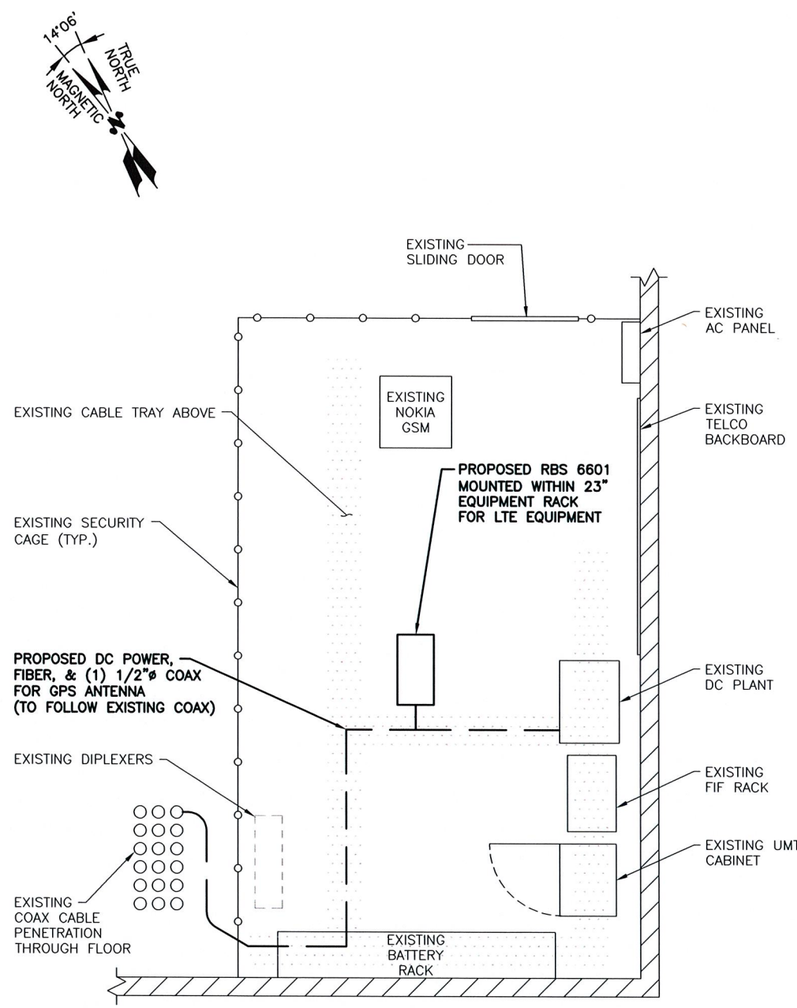
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

COMPOUND PLAN

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

0 8'-0" 16'-0" 32'-0" 48'-0"



EQUIPMENT PLAN

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

0 1'-0" 2'-0" 4'-0" 6'-0"

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: SF

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
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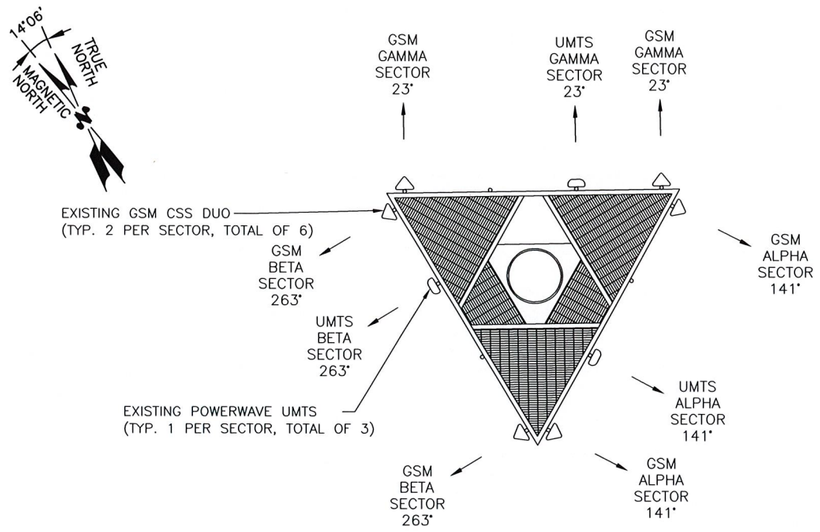


EXISTING GSM/UMTS ANTENNA PLAN

N.T.S.

NOTE:

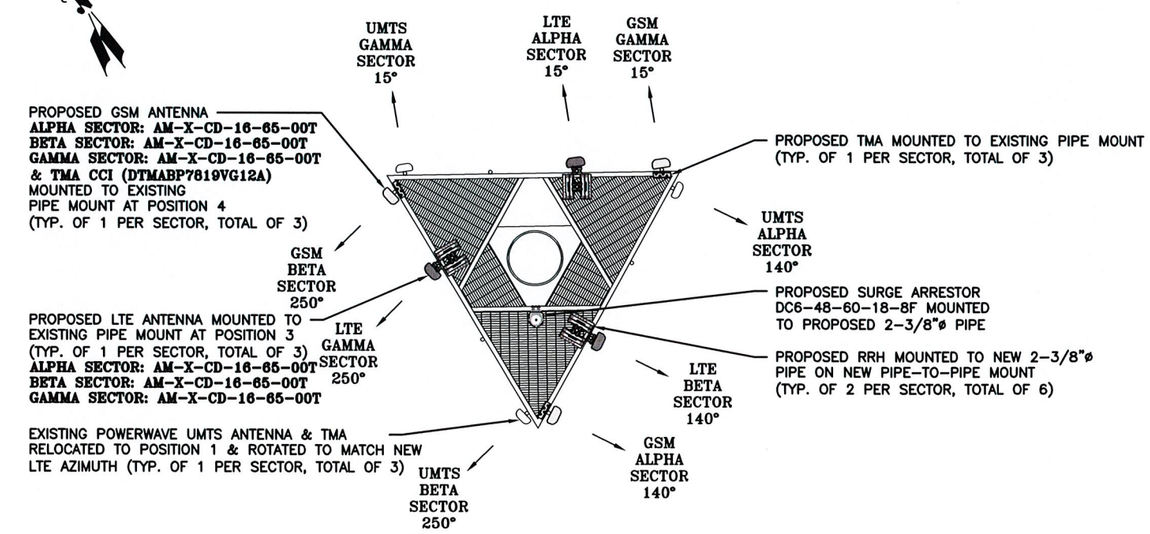
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

PAINT ALL VISIBLE PROPOSED EQUIPMENT TO MATCH EXISTING SURROUNDINGS.

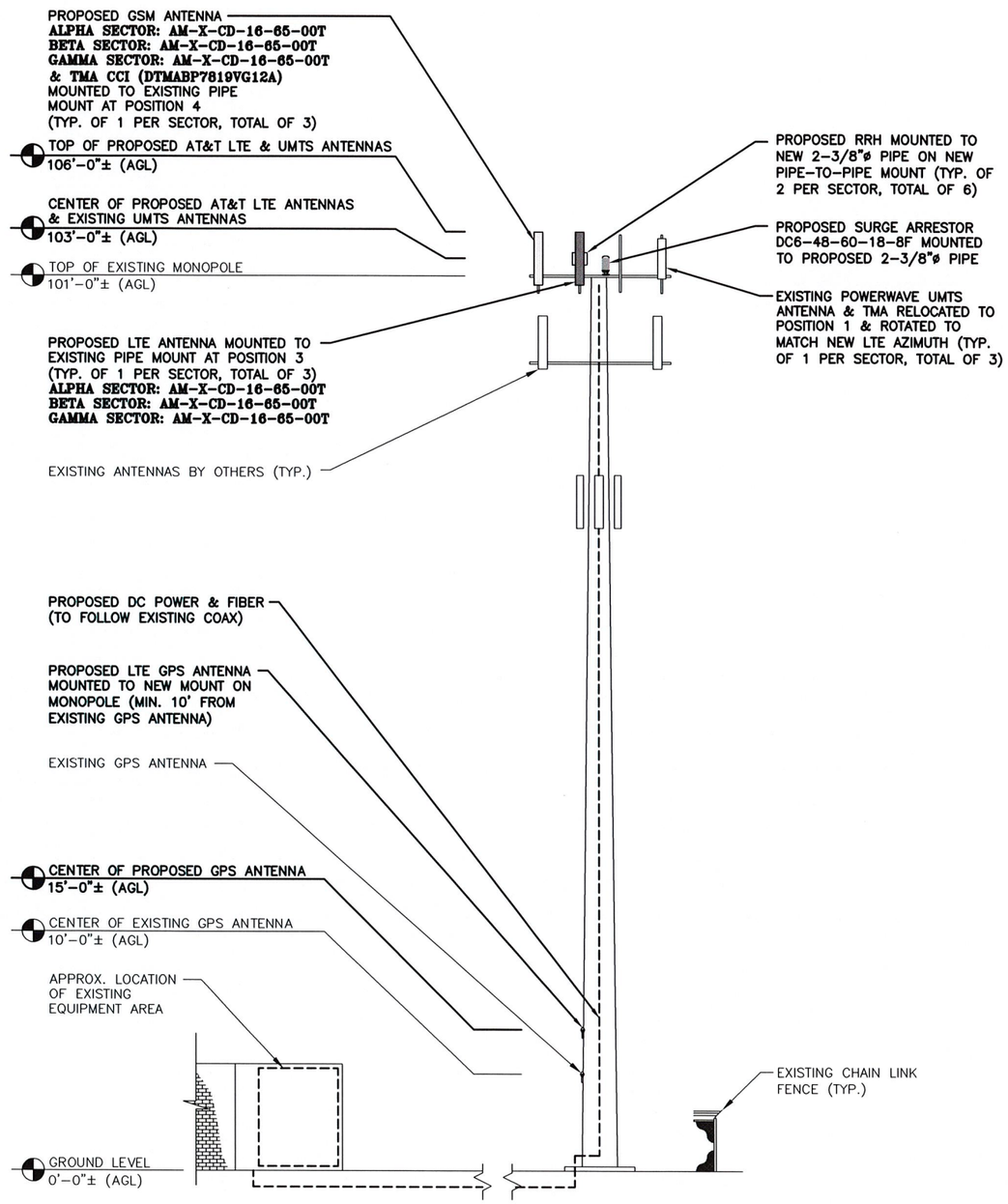
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



PROPOSED LTE ANTENNA PLAN

N.T.S.



SOUTH WEST ELEVATION

SCALE: 1/8"=1'-0"

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a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1026
SITE NAME: WINDSOR
419 BROAD STREET
WINDSOR, CT 06095
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	06/27/12	CONSTRUCTION REVISED	HC	DC	DPH
1	04/17/12	ISSUED FOR CONSTRUCTION	SF	DC	DPH
0	03/21/12	ISSUED FOR REVIEW	SF	DC	DPH

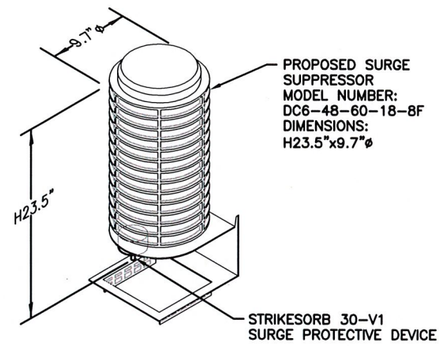
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: SF

STATE OF CONNECTICUT
DANIEL P. HANNON
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA & ELEVATION PLAN (LTE)

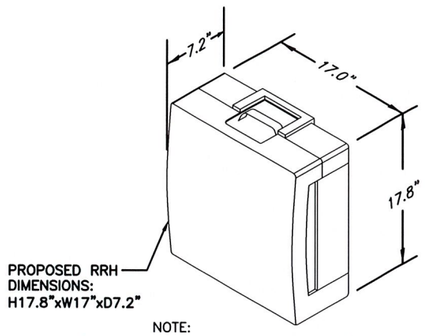
JOB NUMBER	DRAWING NUMBER	REV
1026.01	A-2	2



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

RRH DETAIL

SCALE: N.T.S.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

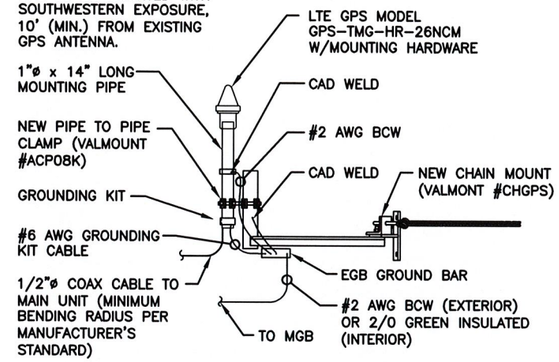
PAINT ALL VISIBLE PROPOSED EQUIPMENT TO MATCH EXISTING SURROUNDINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

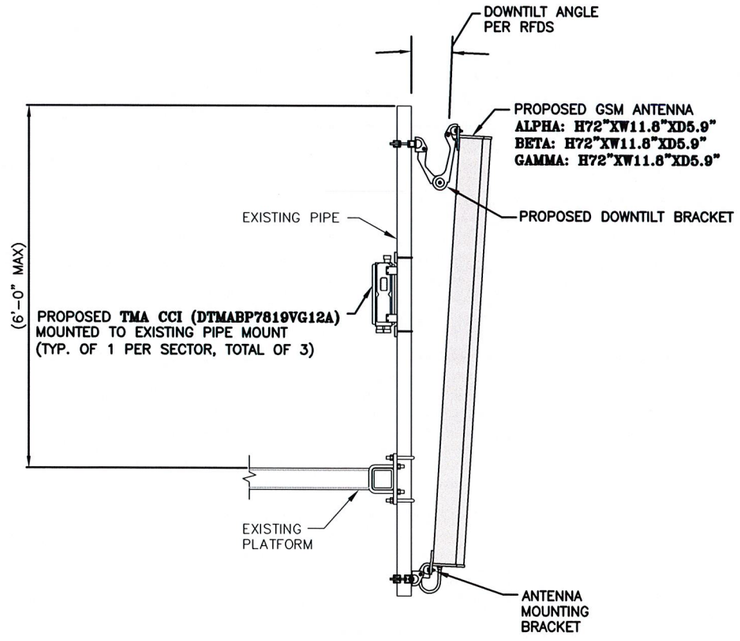
NOTE:

GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE, 10' (MIN.) FROM EXISTING GPS ANTENNA.



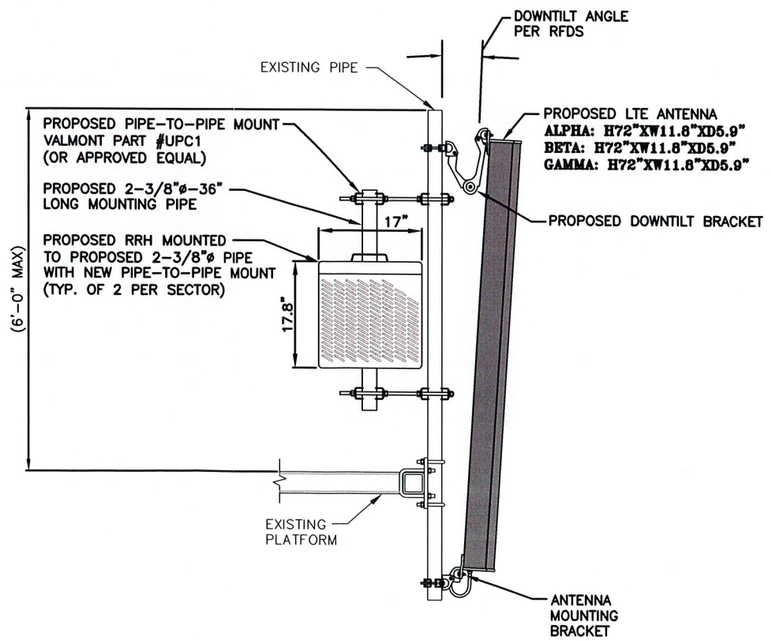
GPS MOUNTING DETAIL

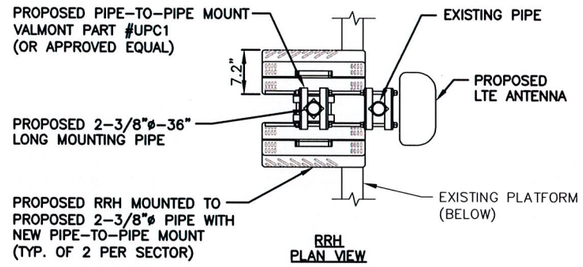
SCALE: N.T.S.



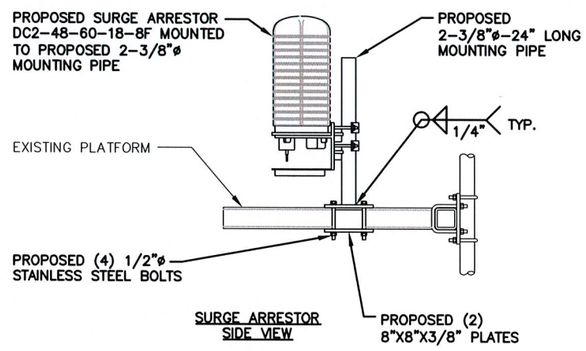
PROPOSED GSM ANTENNA MOUNTING DETAIL

SCALE: N.T.S.





RRH PLAN VIEW



SURGE ARRESTOR SIDE VIEW

PROPOSED LTE ANTENNA, RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: SF

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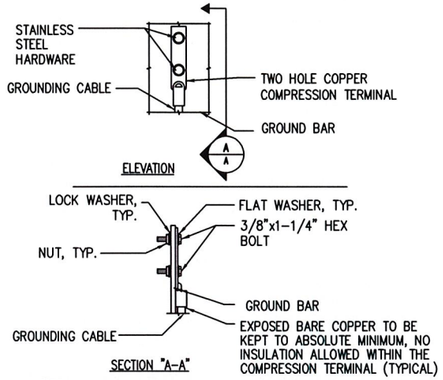
DETAILS (LTE)

JOB NUMBER: 1026.01 | DRAWING NUMBER: A-3 | REV: 2

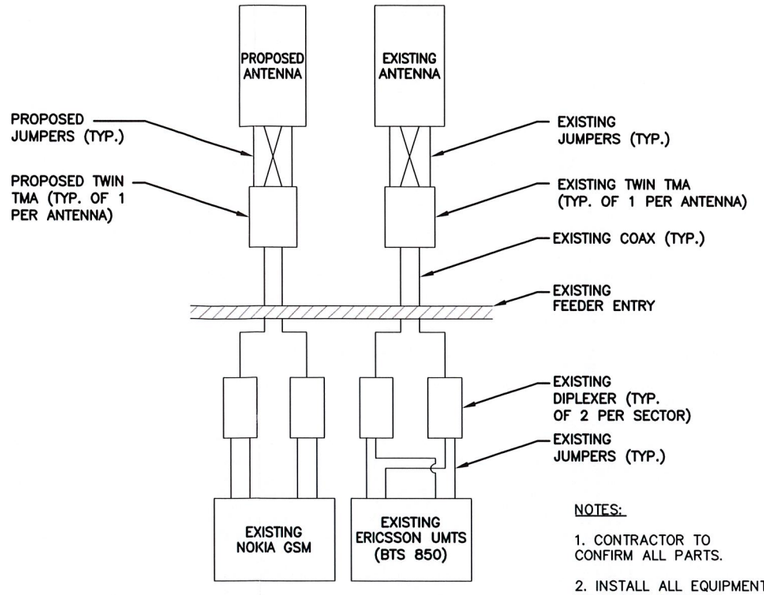
STATE OF CONNECTICUT
DANIEL P. HANNON
No. 24178
LICENSED PROFESSIONAL ENGINEER



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

1 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.

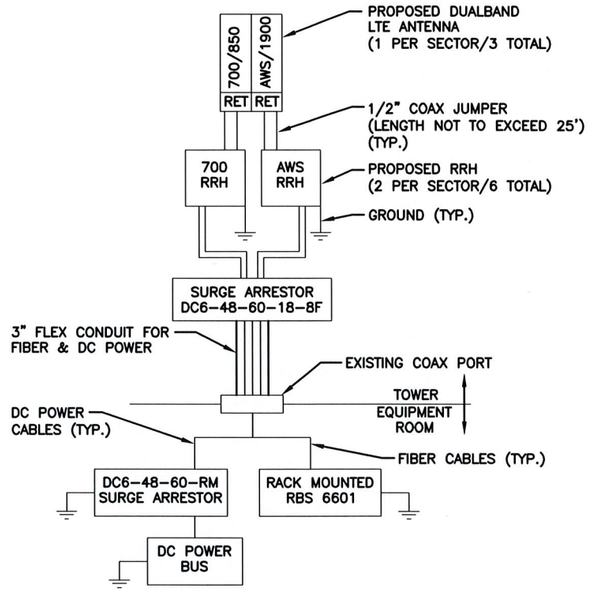


NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

2 UMTS /GSM PLUMBING DIAGRAM

N.T.S.

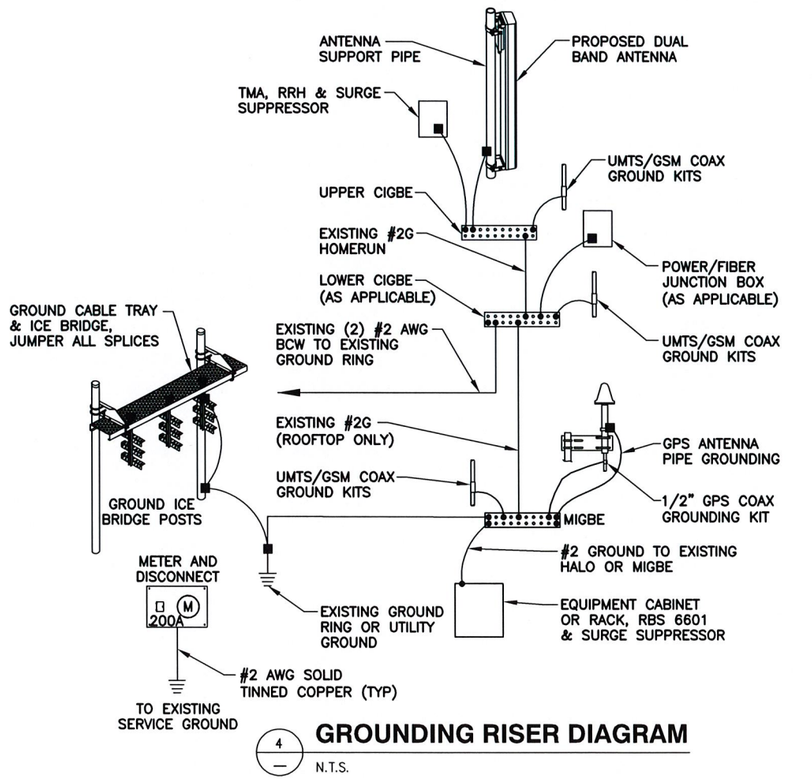


NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

3 PLUMBING DIAGRAM

N.T.S.



4 GROUNDING RISER DIAGRAM

N.T.S.

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

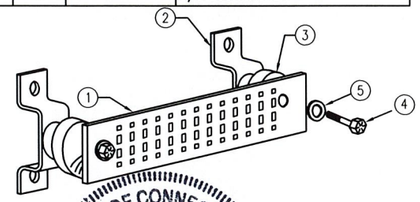
SECTION "P" – SURGE PRODUCERS

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)

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



5 GROUND BAR - DETAIL

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: SF

STATE OF CONNECTICUT
DANIEL P. HARRIS
No. 24170
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AT&T

PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1026.01	G-1	2