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

April 5, 2013

Eric Dahl
Nexlink Global Services
55 Lynn Road
Ivoryton, CT 06442

RE: **EM-AT&T-060-130322** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 500 Cooks Lane, Guilford, Connecticut.

Dear Mr. Dahl:

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;
- Within 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 March 20, 2013. 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 Joseph S. Mazza, First Selectman, Town of Guilford
Regina Reid, Zoning Enforcement Officer, Town of Guilford

EM-AT&T-060-130322

March 20, 2013

VIA OVERNIGHT DELIVERY

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

RE: AT&T Mobility – Notice of Exempt Modification
500 Cooks Lane, Guilford, 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 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of the Town of Guilford.

AT&T plans to modify the existing facility at 500 Cooks Lane, Guilford, CT, owned by Menuncketuck Communications Corporation (coordinates 41°25'7.30"N, -72°42'41.96"W). 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 16-50j-72(b)(2).

1. AT&T proposes to 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 a 3" flex conduit alongside the existing coax on the tower.

2. The proposed changes will not extend the site boundaries. AT&T will install additional equipment within its existing equipment room Thus, there will be 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 changes 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 environments 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 1.42%; the combined site operations will result in a total power density of 9.01%.

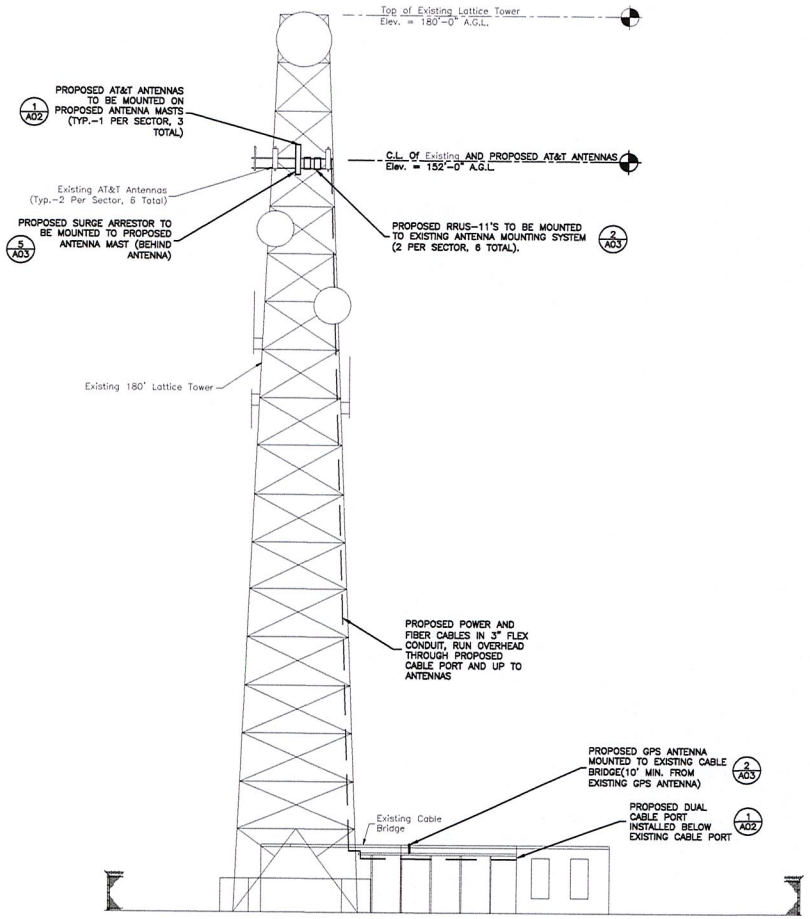
Please feel free to call me with any questions or concerns regarding this matter. Thank you for your consideration.

Respectfully submitted,
AT&T Mobility

By: _____
Eric Dahl, Consultant
edahl@comcast.net
860-227-1975

cc: Honorable Joseph S. Mazza, First Selectman, Town of Guilford

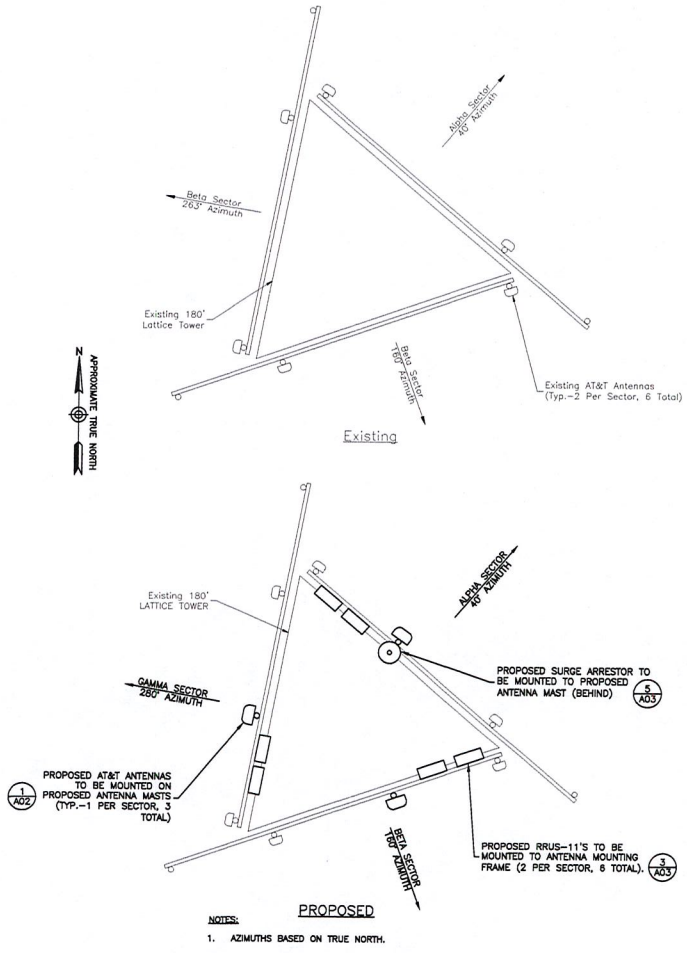
Attachments



A.G.L. = ABOVE GRADE LEVEL
C.L. = CENTER LINE

WEST ELEVATION
SCALE: 3/32"=1' FOR 11"x17"
3/16"=1' FOR 22"x34"

0' 4' 8' 12'



NOTES:
1. AZIMUTHS BASED ON TRUE NORTH.

PLATFORM ANTENNA ORIENTATION 1
SCALE: NTS

Dewberry®
Dewberry Engineers Inc.
800 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

NEXLINK GLOBAL SERVICES
800 MARSHALL PHELPS ROAD, #2A
WINDSOR, CT 06095

NORTH GUILFORD
SITE NO. CT2018
500 COOKS LANE
GUILFORD, CT 06437

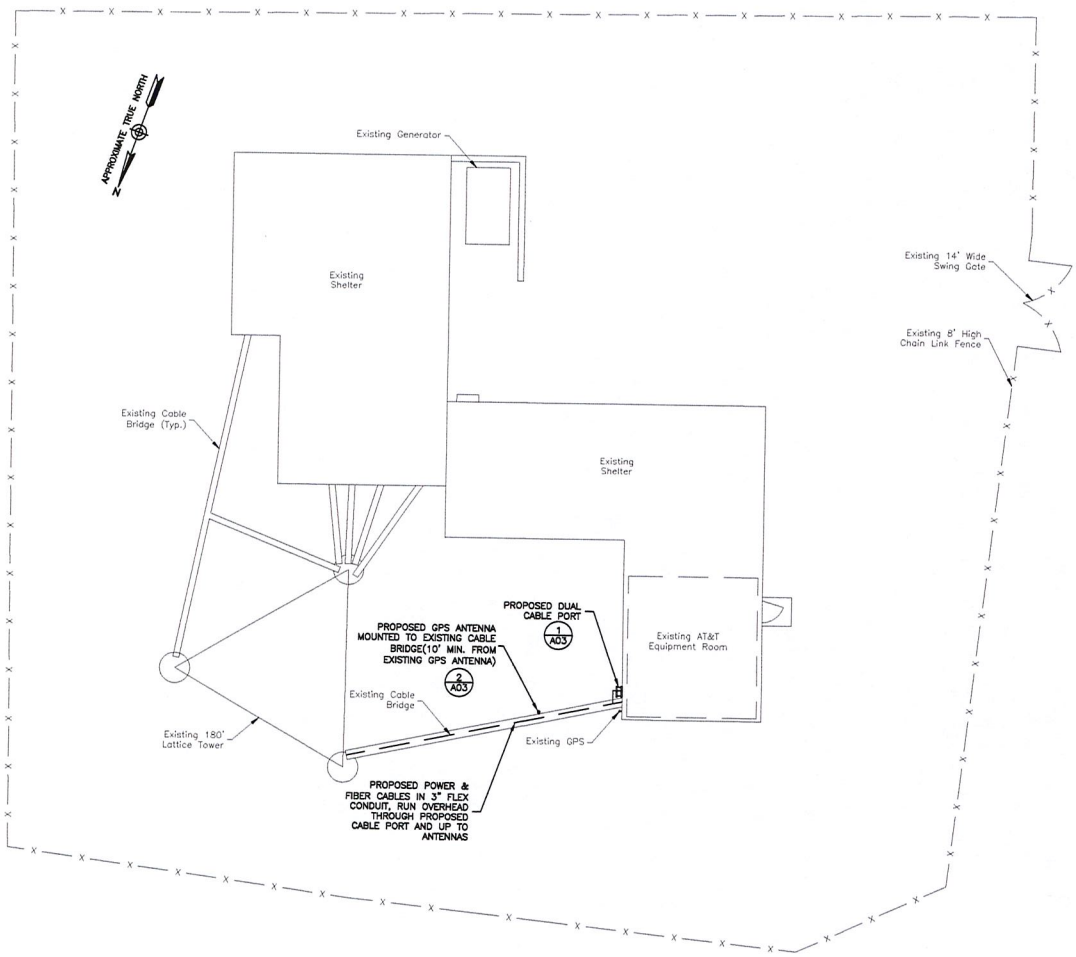
at&t
500 ENTERPRISE DRIVE,
SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	08/16/12	PRELIMINARY SUBMISSION	DER	GHN	GHN

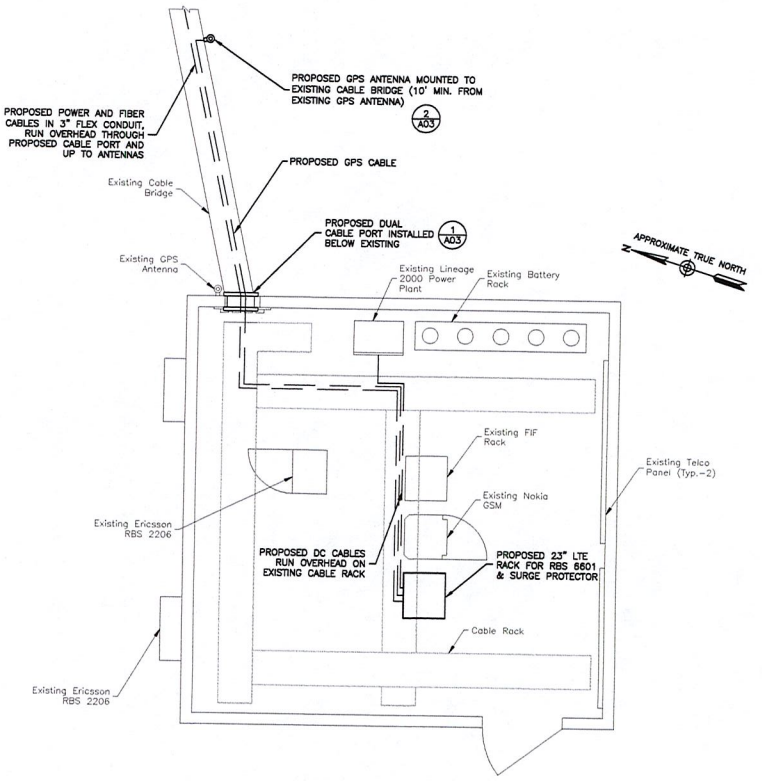
SCALE: AS SHOWN | DESIGNED BY: GMN | DRAWN BY: DER

ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50054281	A02	0



SITE PLAN
SCALE: 1"=200' FOR 11"x17"
1"=100' FOR 22"x34"
0' 100' 200'



SHELTER LAYOUT DETAIL
SCALE: 3/16"=1'-0" FOR 11"x17"
3/8"=1'-0" FOR 22"x34"
0' 1' 2' 4'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. ALL ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY AMERICAN TOWER AND AT&T RF DATA SHEET.
3. NOT ALL INFORMATION SHOWN FOR CLARITY.

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

NEXLINK GLOBAL SERVICES
800 MARSHALL PHELPS ROAD, #2A
WINDSOR, CT 06095

at&t
500 ENTERPRISE DRIVE,
SUITE 3A
ROCKY HILL, CT 06067

NORTH GUILFORD
SITE NO. CT2018
500 COOKS LANE
GUILFORD, CT 06437

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	08/16/12	PRELIMINARY SUBMISSION	DER	GHN	GHN

SCALE: AS SHOWN | DESIGNED BY: GMN | DRAWN BY: DER

SITE PLAN & SHELTER LAYOUT

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50054281	A01	0

Date: March 18, 2013

Mr. John Hernandez
Global Tower Partners
750 Park of Commerce Blvd, Suite 300
Boca Raton, FL 33487

MORRISON HERSHFIELD

Morrison Hershfield Corporation
1455 Lincoln Parkway, Ste. 500
Atlanta, GA. 30346
(770) 379-8500

Subject: **Structural Analysis Report**

GTP Site Number: CT-5043
GTP Site Name: Bartlett Land Corp & Memunketuck Comm. Corp.

Carrier: AT&T
Carrier Site Name: N. Guilford
Carrier Site Number: CT2018

Site Address: 500 Cooks Lane, Guilford, New Haven County, CT
Site Coordinates: Latitude 41° 25' 7.2"N, Longitude 72° 42' 41.8"W
Tower Description: 180 Foot – Self-Support Tower

Morrison Hershfield Project Number: 6130048 / GTP-625

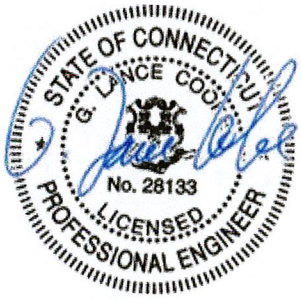
Dear Mr. Hernandez,

Morrison Hershfield Corporation has carried out a structural analysis of the above referenced structure for the existing and proposed antenna and equipment noted in Table 2. This rigorous analysis has been performed in accordance with the ANSI/TIA-222-F *Structural Standard for Antenna Supporting and Antennas* using a fastest mile wind speed of 90 mph (equivalent to a 110 mph 3-second gust wind speed) meeting the requirements of the 2005 Connecticut State Building Code with 2009 Amendments (IBC 2003). This analysis is subject to the assumptions noted.

Our analysis demonstrates that the existing tower and foundation **are in conformance (tower at 86.1% and foundation at 37.3%)** with the requirements of the above noted standards under the effects of loading described in Table 2.

We at Morrison Hershfield Corporation appreciate the opportunity of providing our continuing professional services to you and Global Tower Partners. If you have any questions or need further assistance on this or any other projects please give us a call.

Sincerely,
Morrison Hershfield Corporation



G. Lance Cooke, P.E. (CT License No. PEN.0028133)
Senior Engineer

INTRODUCTION

This tower is a 180ft self-support tower manufactured by Rohn in 1996. The original tower drawings were not available. The tower geometry and member sizes have been obtained from a tower mapping by Global Tower Partners, site ID: CT-5043, dated 2/5/13, and are considered to be accurate. Yield strengths of 50 ksi for the tower legs, 36 ksi for bracing member, A325 for bolts, and A354 Grade BC for the anchor bolts have been assumed based on experience with similar towers.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut State Building Code with 2009 Amendments (IBC 2003) and the ANSI/TIA-222-F Structural standard for Antenna supporting Structures using a fastest mile wind speed of 90 mph without radial ice, 38 mph wind speed with 3/4" radial ice, and 50 mph under service loads.

The structural analysis was based on the following documentation:

Table 1 – Documentation

Document	Description	Source
Tower Mapping	Global Tower Partners, CT-5043, dated 2/5/2013	Global Tower Partners
Foundation Drawings	Rohn Drawing No. A961124-1, dated 02/26/1996	Global Tower Partners
Geotechnical Report	FDH, Project No. 1300551600, dated 2/05/2013	Global Tower Partners
Proposed Loading	GTP application form, dated 8/30/2012	Global Tower Partners

1.0 ANALYSIS LOADING

The existing and proposed antennas, transmission lines, and other equipment considered in this analysis were provided by the client and are noted in Table 2.

Table 2 – Antenna Loads

Elev. (ft)	QTY.	Antenna/Appurtenance Description	Carrier	QTY.	TX-Lines	Notes
		Proposed				
152	2	Commscope SBNH-1D6565C Panel Antenna	AT&T	1 2	Fiber (10 mm) DC (3/4")	2
	1	KMW AM-X-CD-16-65-00T-RET Panel Antenna				
	6	Ericsson RRU-11				
	1	Raycap DC6-48-60-18-8F				
		Existing				
186	1	12' Omni	Radio Room 2	1	7/8"	-
185	1	8' Omni	Radio Room 2	1	7/8"	-
181	1	Pipe Mount				
185	1	10' Dipole	Unknown	-	-	1
185	1	8' Omni	State Police	1	7/8"	-
184.5	1	9' Omni	Menunchetuck Comm.	1	7/8"	-
184	1	8' Omni	Menunchetuck	1	7/8"	-

180	1	Pipe Mount	Comm.			

Elev. (ft)	QTY.	Antenna/Appurtenance Description	Carrier	QTY.	TX-Lines	Notes
		Existing				
183	1	4' Omni	Menunchetuck Comm.	1	7/8"	-
181	1	Pipe Mount				
179	1	10' FM (2 bays) Antenna	Radio Room 2	1	7/8"	-
174.5	1	3' x 6' Grid Dish	Radio Room 2	1	1-1/4"	-
174	1	14'-6" Dipole	Radio Room 2	1	7/8"	-
172.5	1	8' Dia. Dish	Menunchetuck Comm.	1	EW67	-
168.3	1	12' Omni	Radio Room 2	2	7/8"	-
162.3	1	3' Standoff				
152	6	Powerwave 7770 Panel Antenna	AT&T	12	1-5/8"	-
	6	Powerwave LGP17201 TMA				
	3	T-Frame				
142.3	1	12' Omni	Radio Room 2	1	7/8"	-
136.3	1	2' Side Arm				
141.3	1	10' Omni	Menunchetuck Comm.	1	7/8"	-
136.3	1	6' Side Arm				
139	1	12' Omni	Menunchetuck Comm.	1	7/8"	-
133	1	6' Side Arm				
133	1	6' Dia. Dish	Menunchetuck Comm.	1	EW52	-
	1	Pipe Mount				
129.7	1	6' Dia. Grid Dish	Radio Room 2	1	7/8"	-
	1	Pipe Mount				
126.7	1	6' Dia. Dish	State Police	1	EW34	-
	1	Pipe Mount				
124.5	1	6' Dia. Dish	Verizon	1	EW34	-
	1	Pipe Mount				
117.2	1	12' Omni	Verizon	1	1-1/4"	1
111.2	1	6' Side Arm				
115.2	1	4' Dia. Dish	Radio Room 2	1	7/8"	-
	1	Pipe Mount				
115.7	1	3' Dia. Dish	State Police	2	1/4"	-
	1	Airmux-200 ODU				
115.2	1	16' Pipe Mount				
112.7	1	2' Dia. Dish				

	1	Airmux-200 ODU				

Elev. (ft)	QTY.	Antenna/Appurtenance Description	Carrier	QTY.	TX-Lines	Notes
		Existing				
111.7	1	10' Omni	Verizon	2 2	1-5/8" 1/2"	-
106.7	1	6' Side Arm				
101.7	1	10' Omni				
111.7	1	10' Omni	State Police	1	1-5/8"	-
106.7	1	6' Side Arm				
101.7	1	10' Omni				
106.2	1	3' x 6' Grid Dish	Menunchetuck Comm.	2	7/8"	-
104.3	1	10' Pipe Mount				
100.6	1	3' x 6' Grid Dish				
102.7	1	10' Omni	Verizon	3 1	1-5/8" 5/8"	-
97.7	1	T-Frame				
90.2	2	15' Omni				
101.4	1	10' Omni	Verizon	2 2	1-5/8" 1/2"	-
96.4	1	7' Side Arm				
	1	18" x 16" x 6" TMA				
91.4	1	10' Omni				
99.5	1	10' Dipole	Menunchetuck Comm.	1	7/8"	-
94.5	1	3' Standoff				
92.8	1	8'-6" Omni	Menunchetuck Comm.	1	7/8"	-
88.6	1	18" Standoff				
88	1	10' Omni	Radio Room 2	1	1/2"	-
85	1	4' Yagi				
83	1	18" Side Arm				
84.7	3	15' Omni	Verizon	3 1	1-5/8" 1/2"	-
77.4	1	T-Frame				
	1	18" x 18" x 6" TMA				
70	2	15' Omni				
72.75	1	3' x 6' Grid Dish	Radio Room 2	1	1/2"	-
	1	Pipe Mount				
74.75	1	12' Omni	Radio Room 2	1	7/8"	-
68.75	2	3' Yagi				
	1	3' Side Arm				
71	1	10' Dipole	State Police	1	7/8"	-
66	1	Pipe Mount				

58.75	1	14' Omni	Radio Room 2	1	5/8"	-
51.75	1	1' Side Arm				
41	1	3' Yagi	Radio Room 2	1	1/2"	-
	1	Pipe Mount				

Note:
1. Coax is cut at antenna.
2. Proposed loading is addition to existing loading.

2.0 ANALYSIS PROCEDURE

tnxTower version 6.0.4.0, 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 attached at the end of this report.

3.0 ASSUMPTIONS

The analysis provided by Morrison Hershfield is based on the theoretical capacity of the structure and is not a condition assessment of the tower. Morrison Hershfield has not performed an engineering inspection of the tower and the analysis was completed based on information supplied by the customer. Morrison Hershfield has not made any independent determination of the accuracy of the information provided.

1) Tower and structures were built in accordance with the manufacturer's specifications and the applicable ANSI/TIA/EIA standard.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The tower is assumed to be in good condition and capable of supporting its full design capacity.
4) The foundation was properly designed and constructed for the original design loads.
5) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 2.
6) All existing/proposed antennas and antenna mounts are assumed to be adequate for the existing/proposed loads. Analysis of these antennas and antenna mounts is considered to be outside of the scope of this analysis. Morrison Hershfield has not performed an analysis of the existing/proposed antennas or antenna mounts.
7) The existing and proposed AT&T loading has been taken from the Collocation Application form from GTP, dated 08/29/2012.

If any assumptions are not valid or have been made in error, this analysis is invalid. Morrison Hershfield Corporation should be notified to determine the effect on the structural integrity of the tower.

4.0 SUMMARY OF RESULTS

The following tables summarize the location and utilized percentage of available capacity for each component of the tower. With consideration to the appropriate safety factors, 100% represents the full capacity of the component. Percentages below 100% indicate available capacity and conformance of the component. Percentages above 105% indicate an overstressed situation requiring structural modification to ensure conformance with the applicable codes and standards.

Based on our analysis results, the **tower and foundation are within capacity** to support the loads under the existing and proposed loadings (Table 2).

Table 3 – Tower Section Capacity

Section No.	*Elevation ft*	*Component Type*	*Size*	*% Capacity*	*Pass Fail*
T1	180 - 160	Leg	Pipe 3.5 x 0.3	7.5	Pass
T2	160 - 140	Leg	Pipe 3.5 x 0.3	28.7	Pass
T3	140 - 120	Leg	P4.5 x .337	35.7	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
T4	120 - 100	Leg	P5.5x.375	43.1	Pass
T5	100 - 80	Leg	P6.625x.375	46.3	Pass
T6	80 - 60	Leg	Pipe 6.625" x 0.432" (6 XS)	53.7	Pass
T7	60 - 40	Leg	P8.625x0.322	61.1	Pass
T8	40 - 20	Leg	P8.625x0.322	72.5	Pass
T9	20 - 0	Leg	Pipe 8.625" x 0.500" (8 XS)	51.6	Pass
T1	180 - 160	Diagonal	P2-1/2 STD	13.5	Pass
T2	160 - 140	Diagonal	P2 STD	48.0	Pass
T3	140 - 120	Diagonal	P2 STD	71.3	Pass
T4	120 - 100	Diagonal	P2-1/2 STD	85.3	Pass
T5	100 - 80	Diagonal	P3 STD	53.4	Pass
T6	80 - 60	Diagonal	P3 STD	66.0	Pass
T7	60 - 40	Diagonal	P3 STD	75.0	Pass
T8	40 - 20	Diagonal	P3 STD	86.1	Pass
T9	20 - 0	Diagonal	P3 STD	75.7	Pass
T1	180 - 160	Horizontal	P2 STD	8.6	Pass
T2	160 - 140	Horizontal	Pipe 1.9" x 0.145" (1.5 STD)	27.1	Pass
T3	140 - 120	Horizontal	P2 STD	27.6	Pass
T4	120 - 100	Horizontal	P2 STD	41.7	Pass
T5	100 - 80	Horizontal	P2-1/2 STD	30.1	Pass
T6	80 - 60	Horizontal	P3 STD	25.0	Pass
T7	60 - 40	Horizontal	P3 STD	29.9	Pass
T8	40 - 20	Horizontal	P3 STD	36.6	Pass
T9	20 - 0	Horizontal	P3 STD	42.2	Pass
T1	180 - 160	Top Girt	P2 STD	2.4	Pass
T9	20 - 0	Redund Horz 1 Bracing	P2 STD	19.2	Pass
T9	20 - 0	Redund Diag 1 Bracing	P2 STD	45.1	Pass
T9	20 - 0	Redund Hip 1 Bracing	P2 STD	0.3	Pass
T9	20 - 0	Redund Hip Diagonal Bracing	P2-1/2 STD	0.7	Pass
T1	180 - 160	Inner Bracing	L2x2x1/4	0.2	Pass
T2	160 - 140	Inner Bracing	L2x2x1/8	0.3	Pass
T3	140 - 120	Inner Bracing	L2x2x1/8	0.4	Pass
T4	120 - 100	Inner Bracing	L2x2x1/8	0.4	Pass
T5	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	0.3	Pass
T6	80 - 60	Inner Bracing	L3x3x1/4	0.3	Pass
T7	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	0.5	Pass
T8	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	0.5	Pass
T9	20 - 0	Inner Bracing	P3 STD	0.4	Pass
				Summary	
			Leg (T9)	72.5	Pass
			Diagonal (T8)	86.1	Pass
			Horizontal (T9)	42.2	Pass
			Top Girt (T1)	2.4	Pass
			Redund Horz 1 Bracing (T9)	19.2	Pass
			Redund Diag 1 Bracing (T9)	45.1	Pass
			Redund Hip 1 Bracing (T9)	0.3	Pass
			Redund Hip Diagonal Bracing (T9)	0.7	Pass
			Inner Bracing (T8)	0.5	Pass
			Bolt Checks	47.8	Pass
			RATING =	**86.1**	**Pass**

Capacity of Additional Components

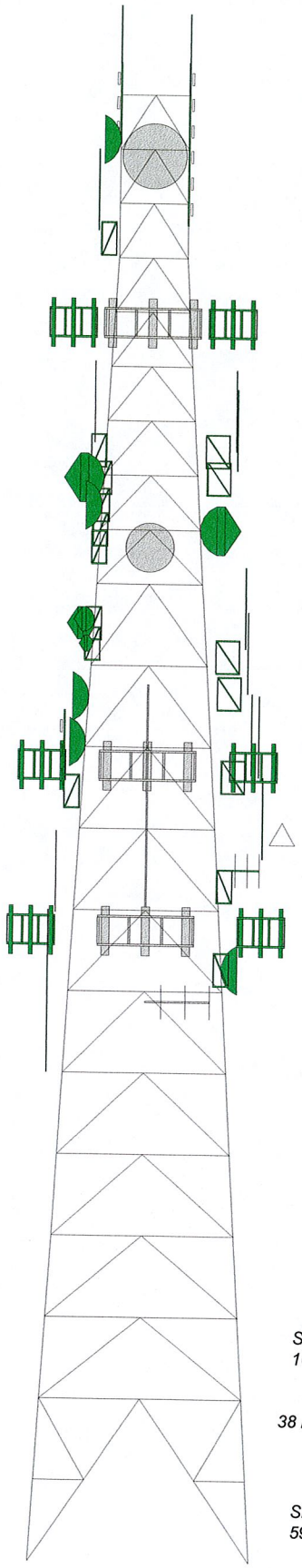
Component	*Capacity*	*Pass/Fail*
Anchor Bolt	43.5	Pass
Foundation Compression	37.3	Pass
Foundation Uplift	27.3	Pass

5.0 RECOMMENDATIONS

1. All assumptions made in this analysis should be carefully reviewed. Morrison Hershfield should be contacted for any discrepancies so that a full assessment may be made to validate the results of this analysis.

ATTACHMENTS: Tower Profile, Program Output, Coax Layout, Additional Calculations, and Collocation Application.

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs	Pipe 3.5 x 0.3		P4.5 x .337	P5.5x.375	P6.625x.375	A	P8.625x0.322		B
Leg Grade					A572-50				
Diagonals		C		P2-1/2 STD			P3 STD		
Diagonal Grade	P2-1/2 STD		P2 STD		A36				
Top Girts					N.A.				
Horizontals	P2 STD			P2 STD			P3 STD		
Red. Horizontals	P2 STD		L2x2x1/8		L2 1/2x2 1/2x3/16	L3x3x1/4			
Red. Diagonals				N.A.	P2-1/2 STD				P2 STD
Red. Hips				N.A.					P2 STD
Inner Bracing				N.A.			L3 1/2x3 1/2x1/4		P3 STD
Face Width (ft)	L2x2x1/4		10.875	13.25	15.625	18	20.375	22.75	25.125
# Panels @ (ft)	8.5	9 @ 6.66667				10 @ 10			1 @ 20
Weight (K)	1.8	1.5	2.0	2.5	3.4	4.1	4.4	4.6	5.3
	27.5								29.6



DESIGNED APPURTENANCE LOADING

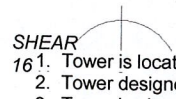
TYPE	ELEVATION	TYPE	ELEVATION
12' Omni (Radio Room 2)	186	12' Omni	117.167
8' Omni (Radio Room 2)	185	3' Dia. Dish	115.667
10' Dipole (Unknown)	185	Dish Mount	115.167
8' Omni (State Police)	185	8' x 3" Mount Pipe (State Police)	115.167
9' Omni (Menunchetuck Comm)	184.5	Airmux-200/ODU (State Police)	115.167
8' Omni (Menunchetuck Comm)	184	4' Dia. Dish	115.167
4' Omni (Menunchetuck Comm)	183	8' x 3" Mount Pipe (State Police)	112.667
2' x 2-1/2" Mount Pipe (Radio Room 2)	181	Airmux-200/ODU (State Police)	112.667
2' x 2-1/2" Mount Pipe (Menunchetuck Comm)	181	2' Dia. Dish	112.667
2' x 2-1/2" Mount Pipe (Menunchetuck Comm)	180	10' Omni (Verizon)	111.667
2-Bay FM Antenna (Radio Room 2)	179	10' Omni (State Police)	111.667
3' x 6' Grid Dish	174.5	6' Sidearm	111.167
14.5' Dipole (Radio Room 2)	174	6' Sidearm (State Police)	106.667
8' Dia. Dish	172.5	6' Sidearm (Verizon)	106.667
12' Omni	168.333	3' x 6' Grid Dish	106.167
3' Standoff Mount	162.333	10' x 2" Mount Pipe	104.333
12' T-Frame	152	10' Omni (Verizon)	102.667
(2) 7770.00 w/ pipe mount	152	10' Omni (State Police)	101.667
(2) 7770.00 w/ pipe mount	152	10' Omni (Verizon)	101.667
(2) 7770.00 w/ pipe mount	152	10' Omni (Verizon)	101.417
(2) LGP17201	152	3' x 6' Grid Dish	100.583
(2) LGP17201	152	10' Dipole	99.5
(2) LGP17201	152	12' T-Frame (Verizon)	97.6667
SBNH-1D6565C w/ pipe mount	152	7' Sidearm (Verizon)	96.4167
SBNH-1D6565C w/ pipe mount	152	Tower Mounted Amplifier (Verizon)	96.4167
AM-X-CD-16-65-00T-RET w/ pipe mount	152	3' Standoff Mount	94.5
(2) RRUS-11	152	8'-6" Omni	92.6667
(2) RRUS-11	152	10' Omni (Verizon)	91.4167
(2) RRUS-11	152	15' Omni (Verizon)	90.1667
DC6-48-60-18-8F Squid	152	18" Standoff	88.5833
12' T-Frame	152	10' Omni	88
12' T-Frame	152	4' Yagi Antenna	85
12' Omni	142.333	(3) 15' Omni (Verizon)	84.6667
10' Omni	141.333	18" Side Arm	83
12' Omni	139	Tower Mounted Amplifier	77.4167
2' Straight Arm (1 Sector)	136.333	12' T-Frame (Verizon)	77.4167
6' Sidearm	136.333	12' Omni	74.75
6' Sidearm	133	Dish Mount	72.75
Dish Mount	133	3' x 6' Grid Dish	72.75
6' Dia. Dish	133	10' Dipole	71
Dish Mount	129.667	(2) 15' Omni (Verizon)	70
6' Grid Dish	129.667	(2) Yagi Antenna (3')	68.75
Dish Mount	126.667	3' Standoff Mount	68.75
6' Dia. Dish	126.667	2' x 2-1/2" Mount Pipe	66
Dish Mount	124.5	14' x 3"Ø Omni	58.75
6' Dia. Dish	124.5	1' Standoff Mount	51.75
		2' x 2-1/2" Mount Pipe	41
		Yagi Antenna (3')	41

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 6.625" x 0.432" (6 XS)	C	Pipe 1.9" x 0.145" (1.5 STD)
B	Pipe 8.625" x 0.500" (8 XS)		

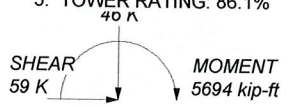
MATERIAL STRENGTH

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



TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 86.1%

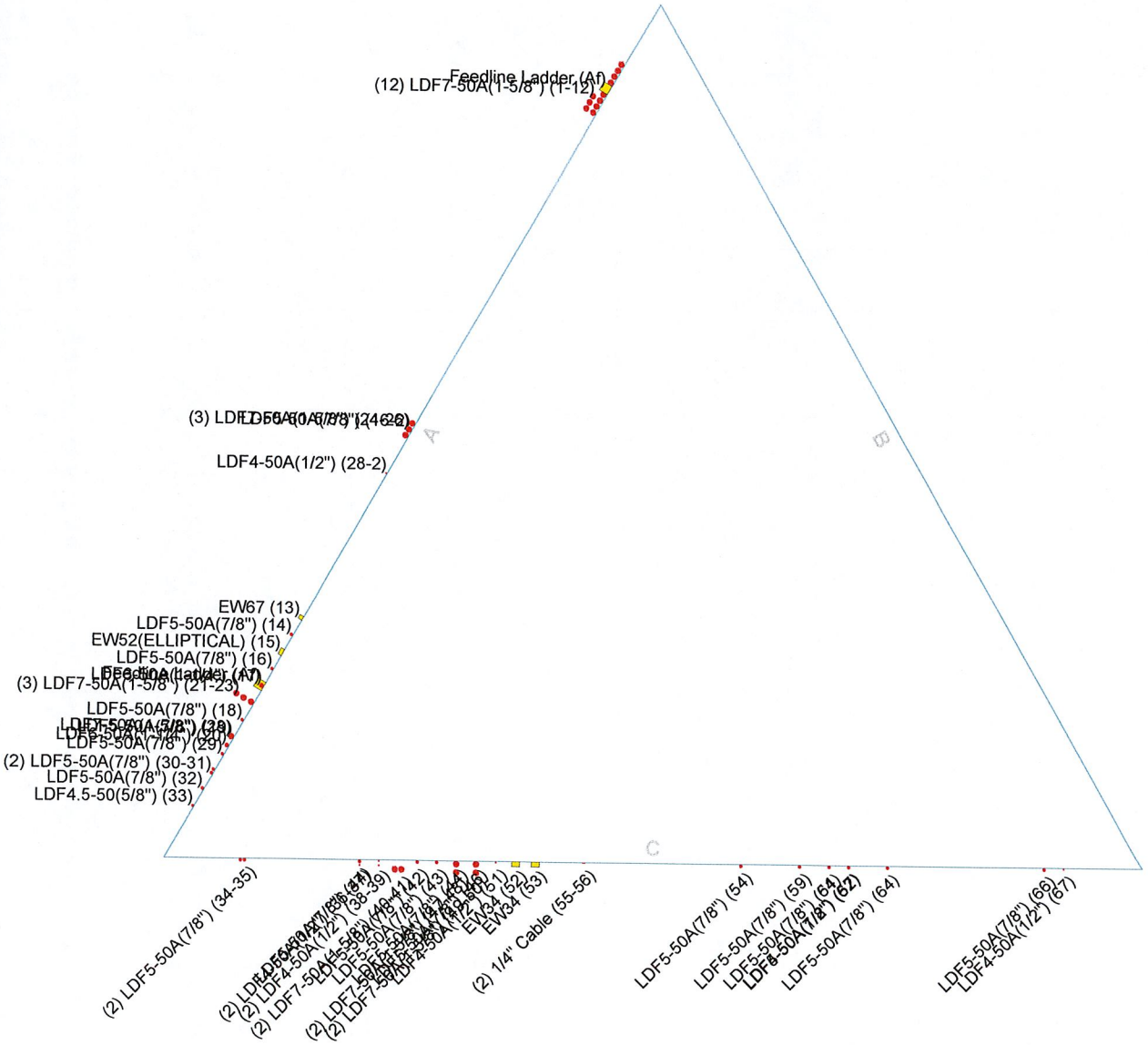


TORQUE 49 kip-ft
REACTIONS - 90 mph WIND

Morrison Hershfield Corp
1455 Lincoln Center Pkwy Ste. 500
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501
Consulting Engineers

Job: GTP-625 / 6130048			
Project: Barlett Land Corp & Memunketuck Comm. Corp. - CT-5			
Client: Global Tower Partners	Drawn by: cmackay	App'd:	
Code: TIA/EIA-222-F	Date: 02/25/13	Scale: NTS	
Path: P:\Projects\Tower Projects\GTP\GTP-625 - CT-5043\GTP-625 SA\Analysis\GTP-625.en		Dwg No. E-1	

Round Flat App In Face App Out Face



Morrison Hershfield 1455 Lincoln Parkway, Suite 500 Atlanta, GA 30346 Phone: (770)-379-8500 FAX: (770)-379-8501 Consulting Engineers	Job: GTP-625 / 6130048		
	Project: Barlett Land Corp & Memunketuck Comm. Corp. - CT-5		
	Client: Global Tower Partners	Drawn by: bvo	App'd:
	Code: TIA/EIA-222-F	Date: 02/20/13	Scale: NTS
	Path: C:\Users\bvo\Desktop\GTP-625 SA\Analysis\GTP-625.eri		Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 8'6" at the top and 27'6" at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

1. Tower is located in New Haven County, Connecticut.
2. Basic wind speed of 90 mph.
3. Nominal ice thickness of 0.7500 in.
4. Ice thickness is considered to increase with height.
5. Ice density of 56 pcf.
6. A wind speed of 38 mph is used in combination with ice.
7. Temperature drop of 50 °F.
8. Deflections calculated using a wind speed of 50 mph.
9. A non-linear (P-delta) analysis was used.
10. Pressures are calculated at each section.
11. Stress ratio used in tower member design is 1.333.
12. 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		

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180'-160'			8'6"	1	20'
T2	160'-140'			8'6"	1	20'
T3	140'-120'			10'10-9/16"	1	20'
T4	120'-100'			13'3"	1	20'
T5	100'-80'			15'7-9/16"	1	20'
T6	80'-60'			18'	1	20'
T7	60'-40'			20'4-9/16"	1	20'
T8	40'-20'			22'9"	1	20'

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T9	20'-0'			25'1-9/16"	1	20'

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180'-160'	6'8-1/32"	K Brace Down	No	Yes	0.0000	0.0000
T2	160'-140'	6'8-1/32"	K Brace Down	No	Yes	0.0000	0.0000
T3	140'-120'	6'8-1/32"	K Brace Down	No	Yes	0.0000	0.0000
T4	120'-100'	10'	K Brace Down	No	Yes	0.0000	0.0000
T5	100'-80'	10'	K Brace Down	No	Yes	0.0000	0.0000
T6	80'-60'	10'	K Brace Down	No	Yes	0.0000	0.0000
T7	60'-40'	10'	K Brace Down	No	Yes	0.0000	0.0000
T8	40'-20'	10'	K Brace Down	No	Yes	0.0000	0.0000
T9	20'-0'	20'	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180'-160'	Pipe	Pipe 3.5 x 0.3	A572-50 (50 ksi)	Pipe	P2-1/2 STD	A36 (36 ksi)
T2 160'-140'	Pipe	Pipe 3.5 x 0.3	A572-50 (50 ksi)	Pipe	P2 STD	A36 (36 ksi)
T3 140'-120'	Pipe	P4.5 x .337	A572-50 (50 ksi)	Pipe	P2 STD	A36 (36 ksi)
T4 120'-100'	Pipe	P5.5x.375	A572-50 (50 ksi)	Pipe	P2-1/2 STD	A36 (36 ksi)
T5 100'-80'	Pipe	P6.625x.375	A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)
T6 80'-60'	Pipe	Pipe 6.625" x 0.432" (6 XS)	A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)
T7 60'-40'	Pipe	P8.625x0.322	A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)
T8 40'-20'	Pipe	P8.625x0.322	A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)
T9 20'-0'	Pipe	Pipe 8.625" x 0.500" (8 XS)	A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180'-160'	Pipe	P2 STD	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180'-160'	None	Flat Bar		A36 (36 ksi)	Pipe	P2 STD	A36 (36 ksi)
T2 160'-140'	None	Flat Bar		A36 (36 ksi)	Pipe	Pipe 1.9" x 0.145" (1.5 STD)	A36 (36 ksi)
T3 140'-120'	None	Flat Bar		A36 (36 ksi)	Pipe	P2 STD	A36 (36 ksi)
T4 120'-100'	None	Flat Bar		A36 (36 ksi)	Pipe	P2 STD	A36 (36 ksi)
T5 100'-80'	None	Flat Bar		A36 (36 ksi)	Pipe	P2-1/2 STD	A36 (36 ksi)
T6 80'-60'	None	Flat Bar		A36 (36 ksi)	Pipe	P3 STD	A36 (36 ksi)
T7 60'-40'	None	Flat Bar		A36 (36 ksi)	Pipe	P3 STD	A36 (36 ksi)
T8 40'-20'	None	Flat Bar		A36 (36 ksi)	Pipe	P3 STD	A36 (36 ksi)
T9 20'-0'	None	Flat Bar		A36 (36 ksi)	Pipe	P3 STD	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 180'-160'	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160'-140'	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 140'-120'	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 120'-100'	Solid Round		A572-50 (50 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 100'-80'	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 80'-60'	Solid Round		A572-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 60'-40'	Solid Round		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T8 40'-20'	Solid Round		A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 20'-0'	Solid Round		A572-50 (50 ksi)	Pipe	P3 STD	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T9 20'-0'	A36 (36 ksi)	Horizontal (1)	Pipe	P2 STD	1
		Diagonal (1)	Pipe	P2 STD	1
		Hip (1)	Pipe	P2 STD	1
		Hip Diagonal		P2-1/2 STD	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8") (1-12)	A	Yes	Ar (CfAe)	152' - 8'	0.0000	0.4	12	9	0.2500 0.7500	1.9800		0.82
Feedline Ladder (Af)	A	Yes	Af (CfAe)	152' - 8'	0.0000	0.4	1	1	3.0000	3.0000	12.0000	8.40
Feedline Ladder (Af)	A	Yes	Af (CfAe)	180' - 8'	0.0000	-0.3	1	1	3.0000	3.0000	12.0000	8.40
LDF4.5-50(5/8") (33)	A	Yes	Ar (CfAe)	51'9" - 8'	0.0000	-0.44	1	1	0.2500 0.7500	0.8650		0.15
LDF5-50A(7/8") (32)	A	Yes	Ar (CfAe)	88'6-31/32" - 8'	0.0000	-0.42	1	1	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (30-31)	A	Yes	Ar (CfAe)	68'9" - 8'	0.0000	-0.4	2	2	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (29)	A	Yes	Ar (CfAe)	180' - 8'	0.0000	-0.38	1	1	0.2500 0.7500	1.0900		0.33
LDF7-50A(1-5/8") (28)	A	Yes	Ar (CfAe)	97'8-1/32" - 8'	0.0000	-0.36	1	1	1.9800	1.9800		0.82
LDF5-50A(7/8") (16)	A	Yes	Ar (CfAe)	94'5-1/32" - 8'	0.0000	-0.28	1	1	0.2500 0.7500	1.0900		0.33
EW52(ELLIPTICAL) (15)	A	Yes	Af (CfAe)	133' - 8'	0.0000	-0.26	1	1	0.2500 0.7500	2.2500	7.0686	0.59
LDF5-50A(7/8") (14)	A	Yes	Ar (CfAe)	129'8-1/32" - 8'	0.0000	-0.24	1	1	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (19)	A	Yes	Ar (CfAe)	133' - 8'	0.0000	-0.36	1	1	0.2500 0.7500	1.0900		0.33
LDF6-50A(1-1/4") (20)	A	Yes	Ar (CfAe)	111'2-1/32" - 8'	0.0000	-0.37	1	1	1.5500	1.5500		0.66
LDF5-50A(7/8") (18)	A	Yes	Ar (CfAe)	180' - 8'	0.0000	-0.34	1	1	0.2500 0.7500	1.0900		0.33
EW67 (13)	A	Yes	Af (CfAe)	172'6" - 8'	0.0000	-0.22	1	1	0.2500 0.7500	1.4000	5.6000	0.45
LDF6-50A(1-	A	Yes	Ar (CfAe)	174'6" - 8'	0.0000	-0.3	1	1	0.2500	1.5500		0.66

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/4")									0.7500			
(17)												
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	180' - 8'	0.0000	0	1	1	0.2500 1.0900	1.0900		0.33
(16-2)												
LDF7-50A(1-5/8")	A	Yes	Ar (CfAe)	97'8-1/32" - 8'	0.0000	-0.32	3	1	0.2500 0.7500	1.9800		0.82
(21-23)												
LDF7-50A(1-5/8")	A	Yes	Ar (CfAe)	77'3-31/32" - 8'	0.0000	0	3	3	0.2500 0.7500	1.9800		0.82
(24-26)												
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	77'3-31/32" - 8'	0.0000	-0.05	1	1	0.2500 0.7500	0.6300		0.15
(28-2)												
*****												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	83' - 8'	0.0000	-0.42	1	1	0.6300	0.6300		0.15
(67)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	175' - 8'	0.0000	-0.4	1	1	0.2500 0.7500	1.0900		0.33
(66)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	180' - 8'	0.0000	0.3	1	1	0.2500 0.7500	1.0900		0.33
(44)												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	41' - 8'	0.0000	-0.2	1	1	0.2500 0.7500	0.6300		0.15
(57)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	66' - 8'	0.0000	-0.18	1	1	0.2500 0.7500	1.0900		0.33
(54)												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	72'9" - 8'	0.0000	0.16	1	1	0.2500 0.7500	0.6300		0.15
(51)												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	96'5-1/32" - 8'	0.0000	0.3	2	1	0.2500 0.7500	0.6300		0.15
(36-37)												
LDF7-50A(1-5/8")	C	Yes	Ar (CfAe)	96'5-1/32" - 8'	0.0000	0.2	2	1	0.2500 0.7500	1.9800		0.82
(47-48)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	104'3-31/32" - 8'	0.0000	0.42	2	2	0.2500 0.7500	1.0900		0.33
(34-35)												
LDF7-50A(1-5/8")	C	Yes	Ar (CfAe)	106'8-1/32" - 8'	0.0000	0.18	2	1	0.2500 0.7500	1.9800		0.82
(49-50)												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	106'8-1/32" - 8'	0.0000	0.28	2	1	0.2500 0.7500	0.6300		0.15
(38-39)												
LDF7-50A(1-5/8")	C	Yes	Ar (CfAe)	106'8-1/32" - 8'	2.0000	0.26	2	2	0.2500 0.7500	1.9800		0.82
(40-41)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	180' - 8'	0.0000	0.2	1	1	0.2500 0.7500	1.0900		0.33
(44)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	136'3-31/32" - 8'	0.0000	0.22	1	1	0.2500 0.7500	1.0900		0.33
(43)												
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	162'3-31/32" - 8'	0.0000	0.24	1	1	0.2500 0.7500	1.0900		0.33
(42)												
LDF5-50A(7/	C	Yes	Ar (CfAe)	162'3-31/32" - 8'	0.0000	0.18	1	1	0.2500	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
8") (46)									0.7500			
EW34 (52)	C	Yes	Af (CfAe)	126'8-1/32" - 8'	0.0000	0.14	1	1	0.2500 0.7500	2.5895	8.1937	1.13
EW34 (53)	C	Yes	Af (CfAe)	124'6" - 8'	0.0000	0.12	1	1	0.2500 0.7500	2.5895	8.1937	1.13
1/4" Cable (55-56)	C	Yes	Ar (CfAe)	115'3" - 8'	0.0000	0.07	2	2	0.2500 0.7500	0.3450		0.06
LDF5-50A(7/8") (54)	C	Yes	Ar (CfAe)	180' - 8'	0.0000	-0.09	1	1	1.0900	1.0900		0.33
LDF5-50A(7/8") (59)	C	Yes	Ar (CfAe)	115'3" - 8'	0.0000	-0.15	1	1	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (62)	C	Yes	Ar (CfAe)	136'3-31/32" - 8'	0.0000	-0.2	1	1	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (61)	C	Yes	Ar (CfAe)	180' - 8'	0.0000	-0.18	1	1	0.2500 0.7500	1.0900		0.33
LDF5-50A(7/8") (64)	C	Yes	Ar (CfAe)	166'9-31/32" - 8'	0.0000	-0.24	1	1	0.2500 0.7500	1.0900		0.33

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
12' Omni (Radio Room 2)	C	From Leg	0.00 0' 0'	0.0000	186'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.23 5.47 7.69 10.71	3.00 4.23 5.47 7.69 10.71	0.02 0.04 0.07 0.16 0.42
***** 8' Omni (Radio Room 2)	B	From Leg	0.00 0' 0'	0.0000	185'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	0.02 0.04 0.06 0.12 0.32
2' x 2-1/2" Mount Pipe (Radio Room 2)	B	From Leg	0.00 0' 0'	0.0000	181'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.36 0.49 0.65 1.01 1.87	0.36 0.49 0.65 1.01 1.87	0.03 0.03 0.04 0.05 0.11
***** 10' Dipole (Unknown)	A	From Leg	0.00 0' 0'	0.0000	185'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.00 2.25 2.50 3.00 4.00	2.00 2.25 2.50 3.00 4.00	0.02 0.03 0.04 0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
*****									
8' Omni (State Police)	B	From Leg	0.00 0' 0'	0.0000	185'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	0.02 0.04 0.06 0.12 0.32
*****									
9' Omni (Menunchetuck Comm)	C	From Leg	0.00 0' 0'	0.0000	184'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 3.63 4.33 5.44 7.79	2.70 3.63 4.33 5.44 7.79	0.02 0.04 0.07 0.13 0.35
****									
8' Omni (Menunchetuck Comm)	B	From Leg	0.00 0' 0'	0.0000	184'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	0.02 0.04 0.06 0.12 0.32
2' x 2-1/2" Mount Pipe (Menunchetuck Comm)	B	From Leg	0.00 0' 0'	0.0000	180'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.36 0.49 0.65 1.01 1.87	0.36 0.49 0.65 1.01 1.87	0.03 0.03 0.04 0.05 0.11
*****									
4' Omni (Menunchetuck Comm)	B	From Leg	0.00 0' 0'	0.0000	183'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.79 1.03 1.28 1.81 3.11	0.79 1.03 1.28 1.81 3.11	0.02 0.02 0.03 0.06 0.15
2' x 2-1/2" Mount Pipe (Menunchetuck Comm)	B	From Leg	0.00 0' 0'	0.0000	181'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.36 0.49 0.65 1.01 1.87	0.36 0.49 0.65 1.01 1.87	0.03 0.03 0.04 0.05 0.11
*****									
2-Bay FM Antenna (Radio Room 2)	C	From Leg	0.00 0' 0'	0.0000	179'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.40 15.00 18.60 25.80 40.20	11.40 15.00 18.60 25.80 40.20	0.22 0.25 0.28 0.35 0.50
*****									
14.5' Dipole (Radio Room 2)	B	From Leg	0.00 0' 0'	0.0000	174'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.38 3.75 4.50 6.00	3.00 3.38 3.75 4.50 6.00	0.04 0.04 0.05 0.07 0.11
*****									
3' Standoff Mount	C	From Leg	1.50 0' 0'	0.0000	162'3-31/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
12' Omni	C	From Leg	3.00 0' 0'	0.0000	168'3-31/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.23 5.47 7.69 10.71	3.00 4.23 5.47 7.69 10.71	0.02 0.04 0.07 0.16 0.42

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
****									
12' T-Frame	A	From Leg	1.50 0' 0'	0.0000	152'	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
						1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
						4" Ice	52.00	52.00	1.54
12' T-Frame	B	From Leg	1.50 0' 0'	0.0000	152'	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
						1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
						4" Ice	52.00	52.00	1.54
12' T-Frame	C	From Leg	1.50 0' 0'	0.0000	152'	No Ice	13.60	13.60	0.47
						1/2" Ice	18.40	18.40	0.60
						1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
						4" Ice	52.00	52.00	1.54
(2) 7770.00 w/ pipe mount	A	From Leg	3.00 0' 0'	0.0000	152'	No Ice	6.22	4.35	0.06
						1/2" Ice	6.77	5.20	0.11
						1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.30
						4" Ice	10.69	10.76	0.68
(2) 7770.00 w/ pipe mount	B	From Leg	3.00 0' 0'	0.0000	152'	No Ice	6.22	4.35	0.06
						1/2" Ice	6.77	5.20	0.11
						1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.30
						4" Ice	10.69	10.76	0.68
(2) 7770.00 w/ pipe mount	C	From Leg	3.00 0' 0'	0.0000	152'	No Ice	6.22	4.35	0.06
						1/2" Ice	6.77	5.20	0.11
						1" Ice	7.30	5.92	0.16
						2" Ice	8.38	7.41	0.30
						4" Ice	10.69	10.76	0.68
(2) LGP17201	A	From Leg	3.00 0' 0'	0.0000	152'	No Ice	1.95	0.52	0.03
						1/2" Ice	2.13	0.64	0.04
						1" Ice	2.33	0.77	0.06
						2" Ice	2.75	1.06	0.09
						4" Ice	3.69	1.73	0.19
(2) LGP17201	B	From Leg	3.00 0' 0'	0.0000	152'	No Ice	1.95	0.52	0.03
						1/2" Ice	2.13	0.64	0.04
						1" Ice	2.33	0.77	0.06
						2" Ice	2.75	1.06	0.09
						4" Ice	3.69	1.73	0.19
(2) LGP17201	C	From Leg	3.00 0' 0'	0.0000	152'	No Ice	1.95	0.52	0.03
						1/2" Ice	2.13	0.64	0.04
						1" Ice	2.33	0.77	0.06
						2" Ice	2.75	1.06	0.09
						4" Ice	3.69	1.73	0.19
*****									
SBNH-1D6565C w/ pipe mount	C	From Leg	3.00 0' 0'	0.0000	152'	No Ice	11.45	9.60	0.10
						1/2" Ice	12.06	11.02	0.18
						1" Ice	12.69	12.29	0.28
						2" Ice	14.03	14.51	0.51
						4" Ice	17.05	19.14	1.13
SBNH-1D6565C w/ pipe mount	B	From Leg	3.00 0' 0'	0.0000	152'	No Ice	11.45	9.60	0.10
						1/2" Ice	12.06	11.02	0.18
						1" Ice	12.69	12.29	0.28
						2" Ice	14.03	14.51	0.51
						4" Ice	17.05	19.14	1.13

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
AM-X-CD-16-65-00T-RET w/ pipe mount	A	From Leg	3.00 0' 0'	0.0000	152'	No Ice	8.50	6.30	0.08
						1/2" Ice	9.15	7.48	0.15
						1" Ice	9.77	8.37	0.22
						2" Ice	11.03	10.18	0.39
						4" Ice	13.68	14.02	0.88
(2) RRUS-11	A	From Leg	3.00 0' 0'	0.0000	152'	No Ice	2.94	1.25	0.06
						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
(2) RRUS-11	B	From Leg	3.00 0' 0'	0.0000	152'	No Ice	2.94	1.25	0.06
						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
(2) RRUS-11	C	From Leg	3.00 0' 0'	0.0000	152'	No Ice	2.94	1.25	0.06
						1/2" Ice	3.17	1.41	0.07
						1" Ice	3.41	1.59	0.10
						2" Ice	3.91	1.96	0.15
						4" Ice	5.02	2.82	0.30
DC6-48-60-18-8F Squid	C	From Leg	3.00 0' 0'	0.0000	152'	No Ice	1.60	1.60	0.03
						1/2" Ice	1.81	1.81	0.05
						1" Ice	2.02	2.02	0.07
						2" Ice	2.49	2.49	0.13
						4" Ice	3.56	3.56	0.27
*****									
2' Straight Arm (1 Sector)	C	From Leg	1.00 0' 0'	0.0000	136'3-31/32"	No Ice	4.50	4.50	0.17
						1/2" Ice	5.50	5.50	0.22
						1" Ice	6.50	6.50	0.26
						2" Ice	8.50	8.50	0.34
						4" Ice	12.50	12.50	0.51
12' Omni	C	From Leg	2.00 0' 0'	0.0000	142'3-31/32"	No Ice	3.00	3.00	0.02
						1/2" Ice	4.23	4.23	0.04
						1" Ice	5.47	5.47	0.07
						2" Ice	7.69	7.69	0.16
						4" Ice	10.71	10.71	0.42
*****									
6' Sidearm	B	From Leg	3.00 0' 0'	0.0000	136'3-31/32"	No Ice	10.00	10.00	0.10
						1/2" Ice	13.00	13.00	0.14
						1" Ice	16.00	16.00	0.18
						2" Ice	22.00	22.00	0.26
						4" Ice	34.00	34.00	0.42
10' Omni	B	From Leg	6.00 0' 0'	0.0000	141'3-31/32"	No Ice	3.00	3.00	0.02
						1/2" Ice	4.03	4.03	0.04
						1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
*****									
6' Sidearm	B	From Leg	3.00 0' 0'	0.0000	133'	No Ice	10.00	10.00	0.10
						1/2" Ice	13.00	13.00	0.14
						1" Ice	16.00	16.00	0.18
						2" Ice	22.00	22.00	0.26
						4" Ice	34.00	34.00	0.42
12' Omni	B	From Leg	6.00 0' 0'	0.0000	139'	No Ice	3.00	3.00	0.02
						1/2" Ice	4.23	4.23	0.04
						1" Ice	5.47	5.47	0.07
						2" Ice	7.69	7.69	0.16

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	10.71	10.71	0.42
*****									
Dish Mount	C	From Leg	0.00 0' 0'	0.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
Dish Mount	C	From Leg	0.00 0' 0'	0.0000	129'8-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
Dish Mount	C	From Leg	0.00 0' 0'	0.0000	126'8-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
Dish Mount	C	From Leg	0.00 0' 0'	0.0000	124'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
6' Sidearm	B	From Leg	3.00 0' 0'	0.0000	111'2-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.00 13.00 16.00 22.00 34.00	10.00 13.00 16.00 22.00 34.00	0.10 0.14 0.18 0.26 0.42
12' Omni	B	From Leg	6.00 0' 0'	0.0000	117'2-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.23 5.47 7.69 10.71	3.00 4.23 5.47 7.69 10.71	0.02 0.04 0.07 0.16 0.42
*****									
Dish Mount	C	From Leg	0.00 0' 0'	0.0000	115'2-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
8' x 3" Mount Pipe (State Police)	C	From Leg	0.00 0' 0'	0.0000	115'2-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	0.04 0.06 0.08 0.14 0.34
8' x 3" Mount Pipe (State Police)	C	From Leg	0.00 0' 0'	0.0000	112'8-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	0.04 0.06 0.08 0.14 0.34
Airmux-200/ODU (State Police)	C	From Leg	0.00 0' 0'	0.0000	115'2-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice	1.40 1.56 1.73 2.09	0.26 0.35 0.46 0.69	0.01 0.02 0.03 0.05

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	2.92	1.27	0.13
Airmux-200/ODU	C	From Leg	0.00	0.0000	112'8-1/32"	No Ice	1.40	0.26	0.01
(State Police)			0'			1/2" Ice	1.56	0.35	0.02
			0'			1" Ice	1.73	0.46	0.03
						2" Ice	2.09	0.69	0.05
						4" Ice	2.92	1.27	0.13
*****									
6' Sidearm	B	From Leg	3.00	0.0000	106'8-1/32"	No Ice	10.00	10.00	0.10
(Verizon)			0'			1/2" Ice	13.00	13.00	0.14
			0'			1" Ice	16.00	16.00	0.18
						2" Ice	22.00	22.00	0.26
						4" Ice	34.00	34.00	0.42
10' Omni	B	From Leg	6.00	0.0000	111'8-1/32"	No Ice	3.00	3.00	0.02
(Verizon)			0'			1/2" Ice	4.03	4.03	0.04
			0'			1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
10' Omni	B	From Leg	6.00	0.0000	101'8-1/32"	No Ice	3.00	3.00	0.02
(Verizon)			0'			1/2" Ice	4.03	4.03	0.04
			0'			1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
*****									
6' Sidearm	B	From Leg	3.00	0.0000	106'8-1/32"	No Ice	10.00	10.00	0.10
(State Police)			0'			1/2" Ice	13.00	13.00	0.14
			0'			1" Ice	16.00	16.00	0.18
						2" Ice	22.00	22.00	0.26
						4" Ice	34.00	34.00	0.42
10' Omni	B	From Leg	6.00	0.0000	111'8-1/32"	No Ice	3.00	3.00	0.02
(State Police)			0'			1/2" Ice	4.03	4.03	0.04
			0'			1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
10' Omni	B	From Leg	6.00	0.0000	101'8-1/32"	No Ice	3.00	3.00	0.02
(State Police)			0'			1/2" Ice	4.03	4.03	0.04
			0'			1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
*****									
10' x 2" Mount Pipe	C	From Leg	0.00	0.0000	104'3-31/32"	No Ice	2.00	2.00	0.08
			0'			1/2" Ice	3.02	3.02	0.10
			0'			1" Ice	4.07	4.07	0.12
						2" Ice	5.70	5.70	0.18
						4" Ice	8.26	8.26	0.39
*****									
12' T-Frame	A	From Leg	1.50	0.0000	97'8-1/32"	No Ice	13.60	13.60	0.47
(Verizon)			0'			1/2" Ice	18.40	18.40	0.60
			0'			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
						4" Ice	52.00	52.00	1.54
10' Omni	A	From Leg	3.00	0.0000	102'8-1/32"	No Ice	3.00	3.00	0.02
(Verizon)			0'			1/2" Ice	4.03	4.03	0.04
			0'			1" Ice	5.03	5.03	0.07
						2" Ice	6.26	6.26	0.14
						4" Ice	8.83	8.83	0.38
15' Omni	A	From Leg	3.00	0.0000	90'2-1/32"	No Ice	3.00	3.00	0.02
(Verizon)			0'			1/2" Ice	4.53	4.53	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	6.07	6.07	0.07
						2" Ice	9.20	9.20	0.17
						4" Ice	13.87	13.87	0.48
*****									
10' Omni (Verizon)	B	From Leg	7.00 0' 0'	0.0000	101'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	0.02 0.04 0.07 0.14 0.38
7' Sidearm (Verizon)	B	From Leg	3.00 0' 0'	0.0000	96'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.00 13.00 16.00 22.00 34.00	10.00 13.00 16.00 22.00 34.00	0.10 0.14 0.18 0.26 0.42
Tower Mounted Amplifier (Verizon)	B	From Leg	7.00 0' 0'	0.0000	96'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 1.60 1.81 2.25 3.23	1.40 1.60 1.81 2.25 3.23	0.03 0.04 0.06 0.09 0.21
10' Omni (Verizon)	B	From Leg	7.00 0' 0'	0.0000	91'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	0.02 0.04 0.07 0.14 0.38
*****									
3' Standoff Mount	C	From Leg	1.50 0' 0'	0.0000	94'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
10' Dipole	C	From Leg	3.00 0' 0'	0.0000	99'6"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.00 2.25 2.50 3.00 4.00	2.00 2.25 2.50 3.00 4.00	0.02 0.03 0.04 0.05 0.07
*****									
18" Standoff	A	From Leg	1.00 0' 0'	0.0000	88'6-31/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
8'-6" Omni	A	From Leg	1.50 0' 0'	0.0000	92'8-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 3.63 4.33 5.44 7.79	2.70 3.63 4.33 5.44 7.79	0.02 0.04 0.07 0.13 0.35
*****									
18" Side Arm	B	From Leg	1.00 0' 0'	0.0000	83'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
10' Omni	B	From Leg	1.50 0' 0'	0.0000	88'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	0.02 0.04 0.07 0.14 0.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
4' Yagi Antenna	B	From Leg	1.50 0' 0'	0.0000	85'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 3.22 4.64 7.48 13.16	1.80 3.22 4.64 7.48 13.16	0.01 0.02 0.03 0.04 0.07
*****									
12' T-Frame (Verizon)	C	From Leg	1.50 0' 0'	0.0000	77'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.60 18.40 23.20 32.80 52.00	13.60 18.40 23.20 32.80 52.00	0.47 0.60 0.73 1.00 1.54
(3) 15' Omni (Verizon)	C	From Leg	3.00 0' 0'	0.0000	84'8-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.53 6.07 9.20 13.87	3.00 4.53 6.07 9.20 13.87	0.02 0.04 0.07 0.17 0.48
(2) 15' Omni (Verizon)	C	From Leg	3.00 0' 0'	0.0000	70'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.53 6.07 9.20 13.87	3.00 4.53 6.07 9.20 13.87	0.02 0.04 0.07 0.17 0.48
Tower Mounted Amplifier	C	From Leg	3.00 0' 0'	0.0000	77'5-1/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 1.60 1.81 2.25 3.23	1.40 1.60 1.81 2.25 3.23	0.03 0.04 0.06 0.09 0.21
*****									
Dish Mount	B	From Leg	0.00 0' 0'	0.0000	72'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.50 5.50 6.50 8.50 12.50	4.50 5.50 6.50 8.50 12.50	0.17 0.22 0.26 0.34 0.51
*****									
3' Standoff Mount	A	From Leg	1.50 0' 0'	0.0000	68'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
(2) Yagi Antenna (3')	A	From Leg	3.00 0' 0'	0.0000	68'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.82 2.50 3.86 6.58	1.14 1.82 2.50 3.86 6.58	0.01 0.01 0.02 0.02 0.04
12' Omni	A	From Leg	3.00 0' 0'	0.0000	74'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.23 5.47 7.69 10.71	3.00 4.23 5.47 7.69 10.71	0.02 0.04 0.07 0.16 0.42
*****									
2' x 2-1/2" Mount Pipe	C	From Leg	0.00 0' 0'	0.0000	66'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.36 0.49 0.65 1.01 1.87	0.36 0.49 0.65 1.01 1.87	0.03 0.03 0.04 0.05 0.11
10' Dipole	C	From Leg	0.00 0' 0'	0.0000	71'	No Ice 1/2" Ice 1" Ice	2.00 2.25 2.50	2.00 2.25 2.50	0.02 0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.00	3.00	0.05
						4" Ice	4.00	4.00	0.07
*****									
1' Standoff Mount	B	From Leg	0.50 0' 0'	0.0000	51'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.31 0.49 0.67 1.03 1.75	0.47 0.72 0.98 1.48 2.50	0.01 0.01 0.02 0.03 0.05
14' x 3"Ø Omni	B	From Leg	1.00 0' 0'	0.0000	58'9"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.20 5.63 7.08 9.95 13.44	4.20 5.63 7.08 9.95 13.44	0.04 0.07 0.11 0.22 0.54
*****									
2' x 2-1/2" Mount Pipe	A	From Leg	0.00 0' 0'	0.0000	41'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.36 0.49 0.65 1.01 1.87	0.36 0.49 0.65 1.01 1.87	0.03 0.03 0.04 0.05 0.11
Yagi Antenna (3')	A	From Leg	0.00 0' 0'	0.0000	41'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.82 2.50 3.86 6.58	1.14 1.82 2.50 3.86 6.58	0.01 0.01 0.02 0.02 0.04

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
3' x 6' Grid Dish	C	Grid	From Leg	0.00 0' 0'	0.0000		174'6"	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.07 29.86 31.44 34.60	0.20 0.35 0.50 0.80 1.39
*****											
8' Dia. Dish	A	Paraboloid w/Shroud (HP)	From Leg	0.00 0' 0'	0.0000		172'6"	8.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	50.27 51.32 52.37 54.48 58.69	0.47 1.01 1.55 2.63 4.79
*****											
6' Dia. Dish	C	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		133'	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.07 29.86 31.44 34.60	0.38 0.45 0.52 0.66 0.94
*****											
6' Grid Dish	C	Grid	From Leg	0.00 0'	0.0000		129'8-1/32"	6.00	No Ice 1/2" Ice	28.27 29.07	0.20 0.35

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
				0'					1" Ice	29.86	0.50
									2" Ice	31.44	0.80
									4" Ice	34.60	1.39
*****											
6' Dia. Dish	B	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		126'8-1/32"	6.00	No Ice	28.27	0.38
									1/2" Ice	29.07	0.45
									1" Ice	29.86	0.52
									2" Ice	31.44	0.66
									4" Ice	34.60	0.94
*****											
6' Dia. Dish	A	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		124'6"	6.00	No Ice	28.27	0.38
									1/2" Ice	29.07	0.45
									1" Ice	29.86	0.52
									2" Ice	31.44	0.66
									4" Ice	34.60	0.94
*****											
4' Dia. Dish	C	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		115'2-1/32"	4.00	No Ice	12.57	0.14
									1/2" Ice	13.10	0.28
									1" Ice	13.62	0.42
									2" Ice	14.68	0.71
									4" Ice	16.80	1.28
*****											
3' Dia. Dish	C	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		115'8-1/32"	3.00	No Ice	7.07	0.18
									1/2" Ice	7.47	0.22
									1" Ice	7.86	0.26
									2" Ice	8.66	0.33
									4" Ice	10.25	0.49
*****											
2' Dia. Dish	C	Paraboloid w/Radome	From Leg	0.00 0' 0'	0.0000		112'8-1/32"	2.00	No Ice	3.14	0.07
									1/2" Ice	3.41	0.28
									1" Ice	3.68	0.49
									2" Ice	4.21	0.92
									4" Ice	5.28	1.77
*****											
3' x 6' Grid Dish	C	Grid	From Leg	0.00 0' 0'	0.0000		106'2-1/32"	6.00	No Ice	28.27	0.20
									1/2" Ice	29.07	0.35
									1" Ice	29.86	0.50
									2" Ice	31.44	0.80
									4" Ice	34.60	1.39
3' x 6' Grid Dish	C	Grid	From Leg	0.00 0' 0'	0.0000		100'6-31/32"	6.00	No Ice	28.27	0.20
									1/2" Ice	29.07	0.35
									1" Ice	29.86	0.50
									2" Ice	31.44	0.80
									4" Ice	34.60	1.39
*****											
3' x 6' Grid Dish	B	Grid	From Leg	0.00 0' 0'	0.0000		72'9"	6.00	No Ice	28.27	0.20
									1/2" Ice	29.07	0.35
									1" Ice	29.86	0.50
									2" Ice	31.44	0.80
									4" Ice	34.60	1.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	254.46	29.67	-17.22
	Max. H_x	10	254.46	29.67	-17.22
	Max. H_z	3	-182.88	-21.21	16.64
	Min. Vert	4	-211.79	-26.61	15.44
	Min. H_x	4	-211.79	-26.61	15.44
	Min. H_z	9	218.67	23.53	-17.74
Leg B	Max. Vert	6	247.34	-29.74	-16.08
	Max. H_x	12	-209.20	26.66	14.36
	Max. H_z	13	-179.12	21.51	14.85
	Min. Vert	12	-209.20	26.66	14.36
	Min. H_x	6	247.34	-29.74	-16.08
	Min. H_z	6	247.34	-29.74	-16.08
Leg A	Max. Vert	2	251.01	-1.02	33.97
	Max. H_x	11	14.86	5.55	1.21
	Max. H_z	2	251.01	-1.02	33.97
	Min. Vert	8	-214.79	0.96	-30.80
	Min. H_x	5	16.95	-5.59	1.43
	Min. H_z	8	-214.79	0.96	-30.80

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	46.45	-0.00	0.00	1.12	33.97	0.00
Dead+Wind 0 deg - No Ice	46.45	0.30	-58.61	-5609.21	-5.98	-47.51
Dead+Wind 30 deg - No Ice	46.45	28.41	-50.28	-4852.42	-2653.58	-31.53
Dead+Wind 60 deg - No Ice	46.45	49.00	-29.06	-2827.34	-4617.54	-2.54
Dead+Wind 90 deg - No Ice	46.45	57.42	-0.19	-34.83	-5434.46	26.14
Dead+Wind 120 deg - No Ice	46.45	50.14	29.92	2917.01	-4691.82	46.13
Dead+Wind 150 deg - No Ice	46.45	27.92	49.70	4791.92	-2588.71	48.89
Dead+Wind 180 deg - No Ice	46.45	-0.27	56.92	5484.09	73.27	44.92
Dead+Wind 210 deg - No Ice	46.45	-28.66	50.42	4892.71	2762.80	29.23
Dead+Wind 240 deg - No Ice	46.45	-50.66	30.57	3006.92	4835.69	1.38
Dead+Wind 270 deg - No Ice	46.45	-57.21	0.17	14.80	5476.04	-25.25
Dead+Wind 300 deg - No Ice	46.45	-48.36	-28.38	-2733.17	4600.93	-42.36
Dead+Wind 330 deg - No Ice	46.45	-27.73	-49.27	-4712.09	2631.15	-47.49
Dead+Ice+Temp	87.48	0.00	-0.00	22.10	101.72	-0.00
Dead+Wind 0 deg+Ice+Temp	87.48	0.76	-15.69	-1476.63	-8.09	-11.14
Dead+Wind 30 deg+Ice+Temp	87.48	7.95	-12.86	-1216.12	-674.50	-2.08
Dead+Wind 60 deg+Ice+Temp	87.48	12.92	-7.59	-722.16	-1142.72	5.42
Dead+Wind 90 deg+Ice+Temp	87.48	15.09	-0.59	-56.95	-1346.56	11.27
Dead+Wind 120 deg+Ice+Temp	87.48	13.89	7.17	689.99	-1227.24	16.23
Dead+Wind 150 deg+Ice+Temp	87.48	7.16	12.60	1227.11	-571.12	15.53
Dead+Wind 180 deg+Ice+Temp	87.48	-0.09	14.43	1408.17	115.29	11.47
Dead+Wind 210 deg+Ice+Temp	87.48	-7.34	12.88	1265.91	800.97	4.66
Dead+Wind 240 deg+Ice+Temp	87.48	-13.53	7.84	786.67	1378.59	-5.09
Dead+Wind 270 deg+Ice+Temp	87.48	-14.78	-0.10	14.59	1506.85	-13.21
Dead+Wind 300 deg+Ice+Temp	87.48	-12.45	-7.21	-667.81	1279.09	-16.89
Dead+Wind 330 deg+Ice+Temp	87.48	-7.22	-12.55	-1172.29	773.94	-16.15
Dead+Wind 0 deg - Service	46.45	0.09	-18.09	-1730.50	21.73	-14.66
Dead+Wind 30 deg - Service	46.45	8.77	-15.52	-1496.88	-795.48	-9.73
Dead+Wind 60 deg - Service	46.45	15.12	-8.97	-871.86	-1401.64	-0.79
Dead+Wind 90 deg - Service	46.45	17.72	-0.06	-9.98	-1653.78	8.07

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 120 deg - Service	46.45	15.47	9.23	901.14	-1424.57	14.24
Dead+Wind 150 deg - Service	46.45	8.62	15.34	1479.77	-775.47	15.09
Dead+Wind 180 deg - Service	46.45	-0.08	17.57	1693.41	46.14	13.86
Dead+Wind 210 deg - Service	46.45	-8.85	15.56	1510.89	876.25	9.02
Dead+Wind 240 deg - Service	46.45	-15.64	9.43	928.87	1516.09	0.42
Dead+Wind 270 deg - Service	46.45	-17.66	0.05	5.34	1713.68	-7.79
Dead+Wind 300 deg - Service	46.45	-14.93	-8.76	-842.81	1443.57	-13.08
Dead+Wind 330 deg - Service	46.45	-8.56	-15.21	-1453.61	835.55	-14.65

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	180 - 160	2.875	35	0.1234	0.0347
T2	160 - 140	2.355	35	0.1212	0.0322
T3	140 - 120	1.847	35	0.1106	0.0277
T4	120 - 100	1.379	35	0.0967	0.0219
T5	100 - 80	0.977	35	0.0820	0.0165
T6	80 - 60	0.644	35	0.0665	0.0131
T7	60 - 40	0.376	35	0.0504	0.0096
T8	40 - 20	0.178	35	0.0324	0.0065
T9	20 - 0	0.058	31	0.0128	0.0035

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
186'	12' Omni	35	2.875	0.1234	0.0347	Inf
185'	8' Omni	35	2.875	0.1234	0.0347	Inf
184'6"	9' Omni	35	2.875	0.1234	0.0347	Inf
184'	8' Omni	35	2.875	0.1234	0.0347	Inf
183'	4' Omni	35	2.875	0.1234	0.0347	Inf
181'	2' x 2-1/2" Mount Pipe	35	2.875	0.1234	0.0347	Inf
180'	2' x 2-1/2" Mount Pipe	35	2.875	0.1234	0.0347	Inf
179'	2-Bay FM Antenna	35	2.849	0.1234	0.0346	Inf
174'6"	3' x 6' Grid Dish	35	2.731	0.1233	0.0341	Inf
174'	14.5' Dipole	35	2.718	0.1233	0.0341	Inf
172'6"	8' Dia. Dish	35	2.679	0.1232	0.0339	Inf
168'3-31/32"	12' Omni	35	2.571	0.1229	0.0334	Inf
162'3-31/32"	3' Standoff Mount	35	2.415	0.1218	0.0326	776434
152'	12' T-Frame	35	2.149	0.1179	0.0306	213570
142'3-31/32"	12' Omni	35	1.905	0.1121	0.0283	114819
141'3-31/32"	10' Omni	35	1.880	0.1115	0.0281	109944
139'	12' Omni	35	1.822	0.1099	0.0274	101053
136'3-31/32"	2' Straight Arm (1 Sector)	35	1.757	0.1082	0.0267	93902
133'	6' Dia. Dish	35	1.677	0.1059	0.0258	86871
129'8-1/32"	6' Grid Dish	35	1.598	0.1036	0.0248	80837
126'8-1/32"	6' Dia. Dish	35	1.529	0.1015	0.0239	76080
124'6"	6' Dia. Dish	35	1.479	0.0999	0.0233	72980
117'2-1/32"	12' Omni	35	1.318	0.0946	0.0211	67388

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
115'8-1/32"	3' Dia. Dish	35	1.286	0.0936	0.0206	67323
115'2-1/32"	4' Dia. Dish	35	1.276	0.0932	0.0205	67326
112'8-1/32"	2' Dia. Dish	35	1.224	0.0914	0.0198	67348
111'8-1/32"	10' Omni	35	1.203	0.0907	0.0195	67357
111'2-1/32"	6' Sidearm	35	1.193	0.0903	0.0193	67361
106'8-1/32"	6' Sidearm	35	1.103	0.0870	0.0181	67401
106'2-1/32"	3' x 6' Grid Dish	35	1.094	0.0866	0.0180	67406
104'3-31/32"	10' x 2" Mount Pipe	35	1.058	0.0853	0.0175	67423
102'8-1/32"	10' Omni	35	1.027	0.0840	0.0171	67470
101'8-1/32"	10' Omni	35	1.008	0.0833	0.0169	67542
101'5-1/32"	10' Omni	35	1.003	0.0831	0.0168	67567
100'6-31/32"	3' x 6' Grid Dish	35	0.988	0.0825	0.0166	67679
99'6"	10' Dipole	35	0.968	0.0816	0.0164	67897
97'8-1/32"	12' T-Frame	35	0.935	0.0803	0.0160	68448
96'5-1/32"	7' Sidearm	35	0.912	0.0793	0.0158	68918
94'6"	3' Standoff Mount	35	0.879	0.0778	0.0154	69711
92'8-1/32"	8'-6" Omni	35	0.847	0.0764	0.0151	70495
91'5-1/32"	10' Omni	35	0.826	0.0754	0.0149	71040
90'2-1/32"	15' Omni	35	0.805	0.0745	0.0147	71593
88'6-31/32"	18" Standoff	35	0.779	0.0732	0.0145	72306
88'	10' Omni	35	0.769	0.0728	0.0144	72573
85'	4' Yagi Antenna	35	0.721	0.0704	0.0139	73974
84'8-1/32"	(3) 15' Omni	35	0.716	0.0702	0.0138	74133
83'	18" Side Arm	35	0.689	0.0689	0.0136	74845
77'5-1/32"	12' T-Frame	35	0.605	0.0645	0.0127	75093
74'9"	12' Omni	35	0.567	0.0624	0.0122	74100
72'9"	3' x 6' Grid Dish	35	0.539	0.0608	0.0119	73315
71'	10' Dipole	35	0.515	0.0594	0.0116	72642
70'	(2) 15' Omni	35	0.501	0.0586	0.0114	72263
68'9"	3' Standoff Mount	35	0.485	0.0576	0.0112	71795
66'	2' x 2-1/2" Mount Pipe	35	0.449	0.0554	0.0107	70786
58'9"	14' x 3"Ø Omni	35	0.361	0.0494	0.0094	68073
51'9"	1' Standoff Mount	35	0.285	0.0433	0.0082	65108
41'	2' x 2-1/2" Mount Pipe	35	0.186	0.0333	0.0066	61201

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.8750	4	1.16	26.46	0.044 ✔	1.333	Bolt Tension
T2	160	Leg	A325N	1.0000	4	5.03	34.56	0.146 ✔	1.333	Bolt Tension
T3	140	Leg	A325N	1.0000	4	10.76	34.56	0.311 ✔	1.333	Bolt Tension
T4	120	Leg	A325N	1.0000	6	10.71	34.56	0.310 ✔	1.333	Bolt Tension
T5	100	Leg	A325N	1.0000	6	15.27	34.56	0.442 ✔	1.333	Bolt Tension
T6	80	Leg	A325N	1.0000	8	15.02	34.56	0.435 ✔	1.333	Bolt Tension
T7	60	Leg	A325N	1.0000	8	18.59	34.56	0.538 ✔	1.333	Bolt Tension
T8	40	Leg	A325N	1.0000	8	22.04	34.56	0.638 ✔	1.333	Bolt Tension
T9	20	Leg	A354-BC	1.0000	10	18.78	32.40	0.580 ✔	1.333	Bolt Tension

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
T1	180 - 160	Leg	Pipe 3.5 x 0.3	7.5	Pass
T2	160 - 140	Leg	Pipe 3.5 x 0.3	28.7	Pass
T3	140 - 120	Leg	P4.5 x .337	35.7	Pass
T4	120 - 100	Leg	P5.5x.375	43.1	Pass
T5	100 - 80	Leg	P6.625x.375	46.3	Pass
T6	80 - 60	Leg	Pipe 6.625" x 0.432" (6 XS)	53.7	Pass
T7	60 - 40	Leg	P8.625x0.322	61.1	Pass
T8	40 - 20	Leg	P8.625x0.322	72.5	Pass
T9	20 - 0	Leg	Pipe 8.625" x 0.500" (8 XS)	51.6	Pass
T1	180 - 160	Diagonal	P2-1/2 STD	13.5	Pass
T2	160 - 140	Diagonal	P2 STD	48.0	Pass
T3	140 - 120	Diagonal	P2 STD	71.3	Pass
T4	120 - 100	Diagonal	P2-1/2 STD	85.3	Pass
T5	100 - 80	Diagonal	P3 STD	53.4	Pass
T6	80 - 60	Diagonal	P3 STD	66.0	Pass
T7	60 - 40	Diagonal	P3 STD	75.0	Pass
T8	40 - 20	Diagonal	P3 STD	86.1	Pass
T9	20 - 0	Diagonal	P3 STD	75.7	Pass
T1	180 - 160	Horizontal	P2 STD	8.6	Pass
T2	160 - 140	Horizontal	Pipe 1.9" x 0.145" (1.5 STD)	27.1	Pass
T3	140 - 120	Horizontal	P2 STD	27.6	Pass
T4	120 - 100	Horizontal	P2 STD	41.7	Pass
T5	100 - 80	Horizontal	P2-1/2 STD	30.1	Pass
T6	80 - 60	Horizontal	P3 STD	25.0	Pass
T7	60 - 40	Horizontal	P3 STD	29.9	Pass
T8	40 - 20	Horizontal	P3 STD	36.6	Pass
T9	20 - 0	Horizontal	P3 STD	42.2	Pass
T1	180 - 160	Top Girt	P2 STD	2.4	Pass
T9	20 - 0	Redund Horz 1 Bracing	P2 STD	19.2	Pass
T9	20 - 0	Redund Diag 1 Bracing	P2 STD	45.1	Pass
T9	20 - 0	Redund Hip 1 Bracing	P2 STD	0.3	Pass
T9	20 - 0	Redund Hip Diagonal Bracing	P2-1/2 STD	0.7	Pass
T1	180 - 160	Inner Bracing	L2x2x1/4	0.2	Pass
T2	160 - 140	Inner Bracing	L2x2x1/8	0.3	Pass
T3	140 - 120	Inner Bracing	L2x2x1/8	0.4	Pass
T4	120 - 100	Inner Bracing	L2x2x1/8	0.4	Pass
T5	100 - 80	Inner Bracing	L2 1/2x2 1/2x3/16	0.3	Pass
T6	80 - 60	Inner Bracing	L3x3x1/4	0.3	Pass
T7	60 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	0.5	Pass
T8	40 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	0.5	Pass
T9	20 - 0	Inner Bracing	P3 STD	0.4	Pass
				Summary	
			Leg (T9)	72.5	Pass
			Diagonal (T8)	86.1	Pass
			Horizontal (T9)	42.2	Pass
			Top Girt (T1)	2.4	Pass
			Redund Horz 1 Bracing (T9)	19.2	Pass
			Redund Diag 1 Bracing (T9)	45.1	Pass
			Redund Hip 1 Bracing (T9)	0.3	Pass
			Redund Hip Diagonal Bracing (T9)	0.7	Pass
			Inner Bracing (T8)	0.5	Pass
			Bolt Checks	47.8	Pass
			RATING =	**86.1**	**Pass**

MORRISON HERSHFIELD

Caisson Analysis - TIA F

Project Number	CN1-178R2	
Date	3/18/2013	
Site Number	817218	
Site Name	Michiana	
Location	Leg	
Anchor Group Diameter:	0.333	ft
Anchor Depth:	19	ft
Number of Anchors:	14	
Depth to Water Table:	200	ft (200 if not applicable)
Grout Bond Strength :	50	PSI

Soil Profile:

Layer	Initial Depth	Final Depth	Ultimate Uplift Skin Friction (psf)	Ultimate Side Shear Capacity (Kips)	Ultimate Compression Skin Friction (psf)	Ultimate Compression Side Shear Capacity (Kips)
1	0	19	36000	10017.9	36000	715.6
2	19		0	0.0		0.0
3	0			0.0		0.0

Total Ultimate Uplift Side Shear Capacity = 10017.9 Kips

Total Ultimate Compression Side Shear Capacity = 715.6 Kips

Allowable Soil End Bearing Pressure: 20,000 PSF

Allowable End Capacity = 405 Kips

Unfactored Weight of Concrete = 30.8 Kips

TIA-F Compression Load = **254.0** **Kips**

Total Compression Load = 284.8 Kips

Compression Capacity = **37.3%** **OK**

TIA-F Tension Load = **215.0** **Kips**

Total Tension Capacity ($W_R/2 + W_C/1.25$) = 5033.6 Kips

Total Tension Capacity ($W_R + W_C)/1.5$ = 6699.2 Kips

Bond Area = 278.28 ft^2

Bond Strength = 2003.6 Kips

Tensile Strength of Steel = 786.24 Kips **Controls**

Total Rock Volume: 11042.2 ft^3

Rock Dead Weight: 1766.8 kips

Uplift Resist: 883.4 kips

Tension Capacity = **27.3%** **OK**

GTP-625 Rock anchor skin friction only

3/18/2013

GLOBAL TOWER PARTNERS

Collocation Application

Check one:	New ☐	Addition to Existing ☐	Modification ☒

PLEASE RETURN THIS APPLICATION TO: (E-MAIL IS PREFERRED)		
GTP		
750 Park of Commerce Blvd Suite 300	E-Mail:	sales@gtpsites.com
Boca Raton, FL 33487-3612 Attn: Leasing	Office: Fax:	(561) 995-0320 (561) 995-0321

LEASE # 13045	
GTP Site #:	CT-5043
GTP Site Name:	Bartlett Land Corp & Memuncketuck Comm. Corp.
GTP Date Received:	8-29-12
Revision Dates:	8-29-12
RSM Approval:	Anthony Cillo 8/30/12

APPLICANT/CARRIER INFORMATION

Carrier Name:	AT&T	Contact Name:	Eric Dahl
Carrier Site Name:	N. Guilford	Contact Number:	860-227-1975
Carrier Site Number:	CT2018	Contact Fax:	
Carrier Legal Entity Name, State of registration: Type of entity (LP, LLC, Corp) d/b/a/ (If applicable)	New Cingular Wireless PCS, LLC Delaware LLC	Contact Address:	55 Lynn Road Ivoryton, CT 06442
Notice Address for Lease: With copies to:	6100 Atlantic Blvd, Norross, GA 30071	Contact E-mail: Additional E-mail:	edahl@comcast.net
Carrier Invoice Address: Carrier Invoice Contact - Name, Title, Phone No.	6100 Atlantic Blvd, Norross, GA 30071	Other: Carrier NOC#	

ADDITIONAL CARRIER INFORMATION

Leasing Contact Name/Number:	Eric Dahl (860) 227-1975
RF Contact Name/Number:	Radu Alecsandru (860) 513-7598
Construction Contact Name/Number:	Brian Paul (201) 406-5586
Emergency Contact Name/Number:	NOC 866-915-5600

SITE INFORMATION

Latitude:	41	25	07.2	N	Existing Structure Type:	SST
Longitude:	72	42	41.8	W	Existing Structure Height:	180'
Site Address:	500 Cooks Lane, Guilford, CT					

Antenna Equipment Specifications

Sectors (1, 2, 3 etc. - if applicable)						
Equipment Type (Panel, Omni, RRU, TMA, RET, MW Dish etc.)	Panel	TMA	Panel	Panel	RRU	Surge Arrestor
Installation Status (Existing, Proposed etc.)	Existing (to remain)	Existing (to remain)	Proposed	Proposed	Proposed	Proposed
Rad Center AGL (ft)	152	152	152	152	152	152
Equipment Mount Height (ft)	152	152	152	152	152	152
Equipment Mount Type						
Equipment Quantity	6	6	1	2	6	1
Equipment Manufacturer	Powerwave	Powerwave	KMW	Commscope	Ericsson	Raycap
Equipment Model #	7770	LGP17201	AM-X-CD-16-65-00T-RET	SBNH-1D6565C	RRU-11	DC6-48-60-18-8F
Equipment Weight (per item in lbs))	35		48.5	60.85	55	20 lbs
Equipment Dimensions (HxWxD) (Indicate feet or inches)	55" x 11" x 5"		72" 11.8" x 5.9"	96" x 11.85" x 7"	17.8" x 17" x 7.2"	23.5" x 9.7"
TOTAL # of LINES for equipment in column	12	N/A	N/A	N/A	3	N/A
Line Type	Coax		N/A	N/A	(1) Fiber trunk/ (2) WR-VG86ST-BRD	

GLOBAL TOWER PARTNERS

Collocation Application

					DC Cables	
Line Diameter/Size	1 5/8"		N/A	N/A	10mm / 3/4 "	
Orientation/Azimuth (degrees from true north)	40, 160, 280		280	40, 160		
Mechanical Tilt (degrees)				0 - 8		
TX Frequency	880-894, 1930-1990		704-716	704-716		
RX Frequency	835-850, 1850-1910		734-746	734-746		
ERP (watts)			250	250		
Type of Technology (i.e. 3G, LTE, CMDA etc)	GSM/UMTS			LTE	LTE	LTE

Will RRU's be installed behind Antennas ☑ **Yes** ☐ **No**

If no, please explain:

FIBER: ☐ **Yes** ☐ **No** **Who is Provider?**

PLEASE NOTE - All Equipment Lines are required to be installed inside the tower when space is available. Carriers will be charged an additional $25.00 per line per month if equipment lines are installed on the outside of the tower even though there is available space inside the tower. GTP must approve any installation of lines on the outside of towers prior to installation commencement.

GROUND SPACE REQUIREMENTS

Total Ground Area Dimensions Required (length x width x height in ft.)	400 sq feet 20' x 20'	**Generator:** ☐ Diesel ☐ Propane ☐ Natural Gas Pad Dimension (L X W, ft.):	
Cabinet Pad Dimensions		Cabinet Manufacturer	
Shelter Pad Dimensions		Shelter Manufacturer	

AC POWER REQUIREMENTS.

Voltage:	Total Amperage:

Comments:

Scope of Work:

- Add three (3) new LTE antennas
- Add six (6) RRU's
- Add One (1) Ray Cap Surge Arrestor
- Add One (1) Rosenberger FB-L98B-002 fiber trunk
- Add two (2) WR-VG86ST-BRD DC cables

Final Configuration:

- Nine (9) Panel Antennas:
  - One (1) KMW AM-X-CD-16-65-00T (NEW)
  - Two (2) Commscope SBNH-1D6565C (NEW)
  - Six(6) Powerwave 7770
- Twelve (12) RFS 1 5/8" coax
- Six (6) Powerwave LGP217201 TMA's
- Six (6) Ericsson RRU-11 RRU's
- One (1) Raycap DC6-48-60-18-8F surge arrestor
- One (1) Rosenberger FB-L98B-002 fiber trunk 10 mm
- Two (2) WR-VG86ST-BRD DC cables @ ¾"

GLOBAL TOWER PARTNERS

Collocation Application

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

Calculated Radio Frequency Emissions

at&t

CT2018

(North Guilford)

500 Cooks Lane, Guilford, CT 06437

March 19, 2013

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 lattice tower located at 500 Cooks Lane in Guilford, CT. The coordinates of the tower are 41° 25' 07.30" N, 72° 42' 41.96" W.

AT&T is proposing the following modifications:

1) Install three multi-band (700/850/1900/2100 MHz) antennas for their LTE network (one 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
AT&T UMTS	*153*	*880*	*1*	*500*	*0.0077*	*0.5867*	*1.31%*
AT&T GSM	*153*	*880*	*4*	*296*	*0.0182*	*0.5867*	*3.10%*
AT&T GSM	*152.5*	*1900*	*2*	*427*	*0.0132*	*1.0000*	*1.32%*
BAM/Verizon	Dishes at Various Heights						0.01%
DPS - Antenna 1 (CSP)	130	6665	1	5532	0.0004	1.0000	0.04%
DPS - Antenna 2 (CSP)	130	6665	1	5516	0.0004	1.0000	0.04%
DPS - Antenna 3 (CSP)	120	866	5	198.6	0.0035	0.5773	0.60%
DPS - Antenna 4 (CSP)	120	866	5	198.6	0.0035	0.5773	0.60%
DPS - Antenna 5 (CSP)	120	866	5	198.6	0.0035	0.5773	0.60%
DPS - Antenna 9 (Private)	180	49	1	60	0.0001	0.2000	0.05%
DPS - Antenna 10 (Private)	180	98.1	1	10	0.0000	0.2000	0.01%
DPS - Antenna 13 (Private)	120	221	1	20	0.0002	0.2000	0.11%
DPS - Antenna 15 (Private)	80	449.475	1	25	0.0009	0.2997	0.31%
DPS - Antenna 16 (Private)	80	449.9	1	20	0.0002	0.2999	0.06%
DPS - Antenna 17 (Private)	100	451.425	1	750	0.0034	0.3010	1.14%
DPS - Antenna 18 (Private)	180	451.7	1	237	0.0004	0.3011	0.13%
DPS - Antenna 20 (Private)	120	452.125	1	301	0.0011	0.3014	0.35%
DPS - Antenna 21 (Private)	80	452.875	1	101	0.0009	0.3019	0.29%
DPS - Antenna 22 (Private)	120	460.9875	1	60	0.0000	0.3073	0.01%
DPS - Antenna 23 (Private)	100	461.9	1	316	0.0016	0.3079	0.53%
DPS - Antenna 24 (Private)	165	463.025	1	750	0.0014	0.3087	0.44%
DPS - Antenna 25 (Private)	165	463.1	1	750	0.0014	0.3087	0.44%
DPS - Antenna 26 (Private)	165	463.975	1	237	0.0005	0.3093	0.15%
DPS - Antenna 27 (Private)	80	692	1	316	0.0025	0.4613	0.53%
DPS - Antenna 28 (Private)	180	929.8125	1	1986	0.0033	0.6199	0.53%
DPS - Antenna 29 (Private)	170	929.8375	1	1986	0.0037	0.6199	0.59%
DPS - Antenna 30 (Private)	180	935.8125	1	143	0.0002	0.6239	0.04%
AT&T UMTS	152	880	2	565	0.0018	0.5867	0.30%
AT&T UMTS	152	1900	2	875	0.0027	1.0000	0.27%
AT&T LTE	152	734	1	1375	0.0021	0.4893	0.44%
AT&T GSM	152	880	1	283	0.0004	0.5867	0.08%
AT&T GSM	152	1900	4	525	0.0033	1.0000	0.33%
						Total	**9.01%**

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

[1] The existing CSC filing for AT&T 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 1/14/2013. 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 Morrison Hershfield Corporation Structural Analysis dated March 18, 2013.

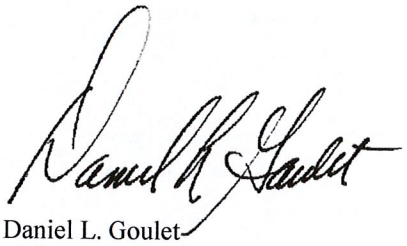
5. Conclusion

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 **9.01% 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

March 19, 2013
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.

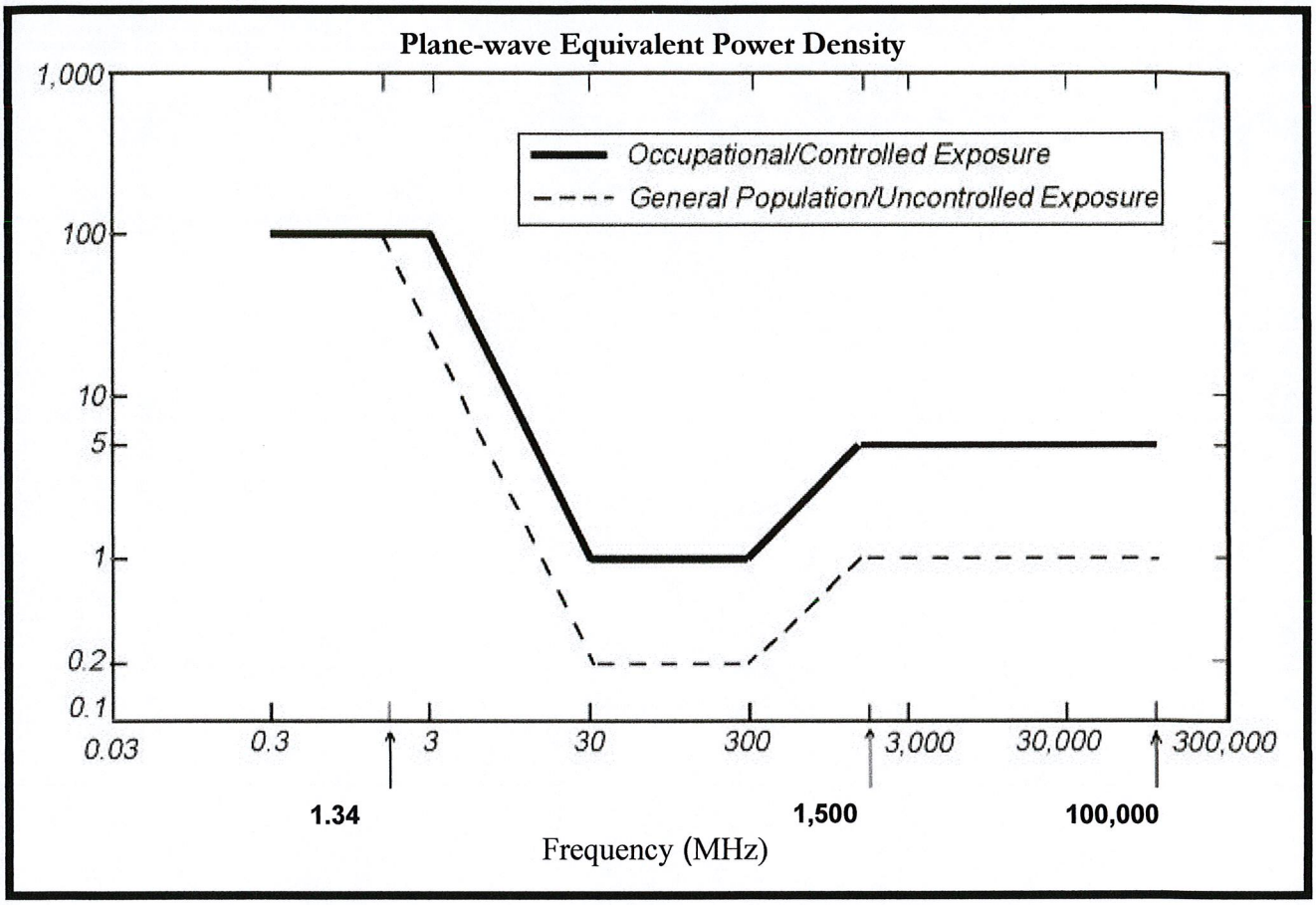
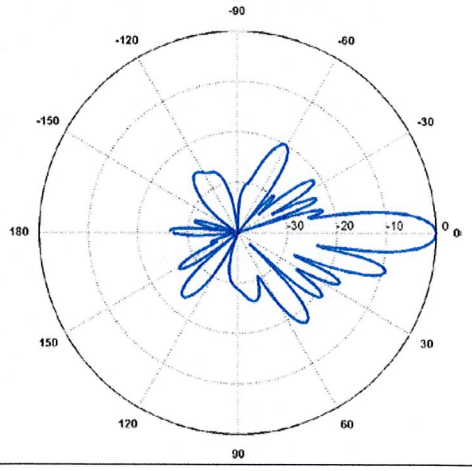


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

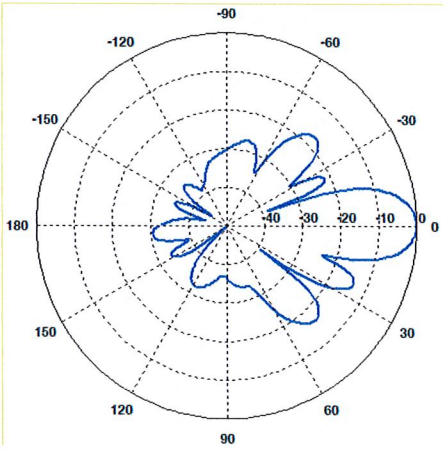
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.6" x 7.1"



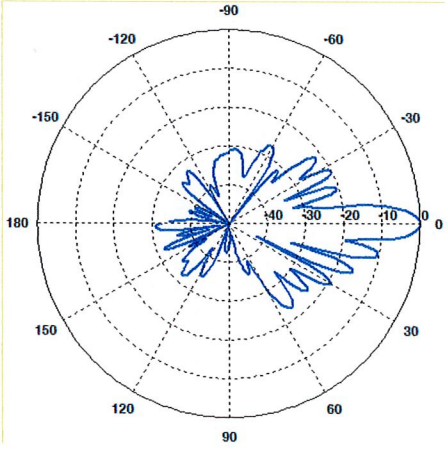
850 MHz

Manufacturer:	Powerwave
Model #:	7770.00
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

Manufacturer:	Powerwave
Model #:	7770.00
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"



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

March 22, 2013

The Honorable Joseph S. Mazza
First Selectman
Town of Guilford
31 Park Street
Guilford, CT 06437

RE: **EM-AT&T-060-130322** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 500 Cooks Lane, Guilford, Connecticut.

Dear First Selectman Mazza:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by April 5, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/cm

c: Regina Reid, Zoning Enforcement Officer, Town of Guilford

CSC
CONNECTICUT SITING COUNCIL