EM-AT&T-036-120830

August 24, 2012

VIA OVERNIGHT DELIVERY

ORIGINAL

RECEIVED
AUG 30 2012
CONNECTICUT
SITING COUNCIL

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

RE: AT&T Mobility – Notice of Exempt Modification
220 Winthrop Road, Deep River 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 Deep River.

AT&T plans to modify the existing facility at 220 Winthrop Road, Deep River owned by TowerCo (coordinates 41°21'57.1"N, -72°28'29.2"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.The height of the overall structure will be unaffected. 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 inside the monopole.

2.The proposed changes will not extend the site boundaries. AT&T will install additional equipment on a concrete pad, adjacent to its existing equipment. 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 1.44%; the combined site operations will result in a total power density of 10.09%.

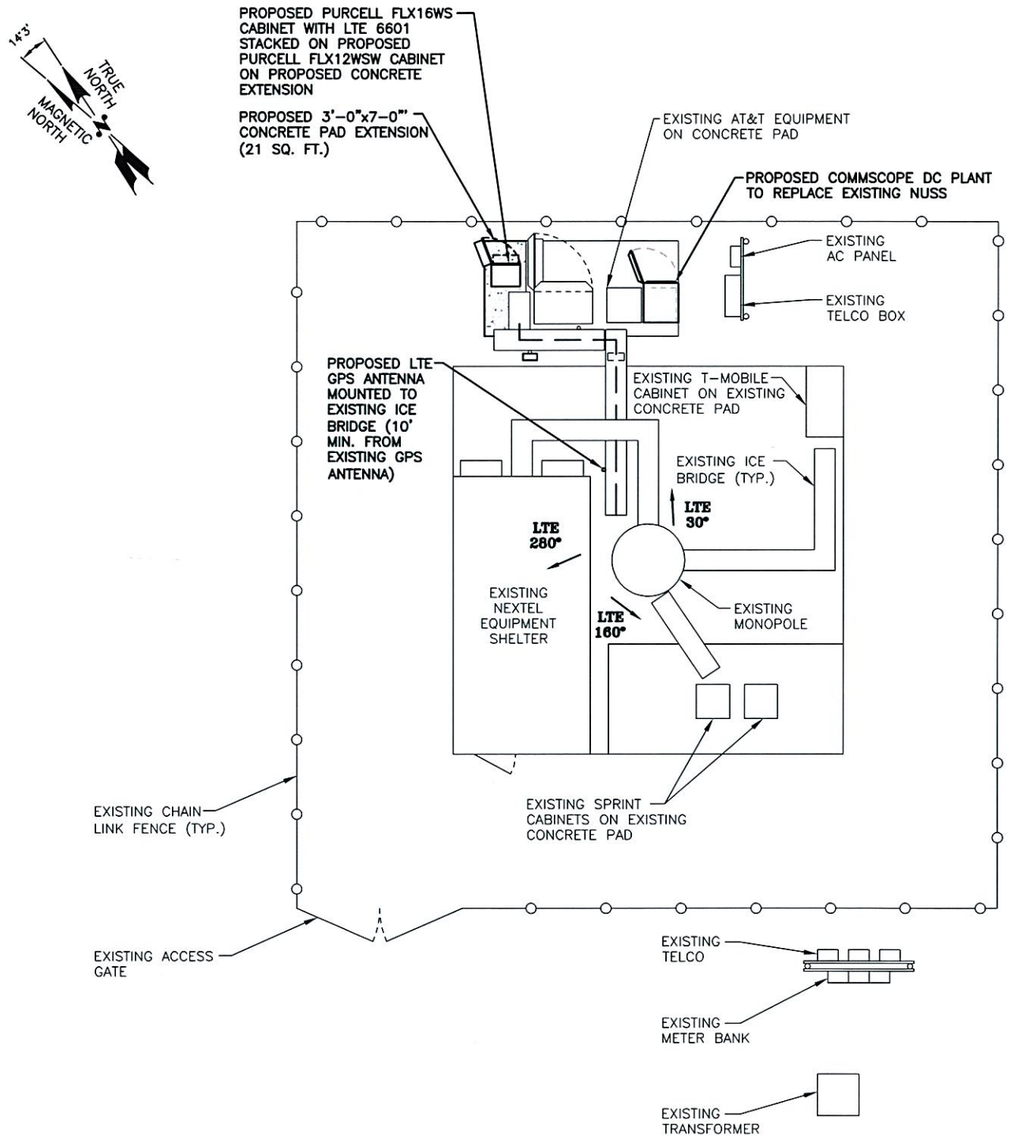
Please feel free to call me with any questions or concerns regarding this matter. Thank you for your consideration.

Respectfully submitted,
AT&T Mobility

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

cc: Richard H. Smith, First Selectman, Town of Deep River

Attachments



COMPOUND PLAN

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

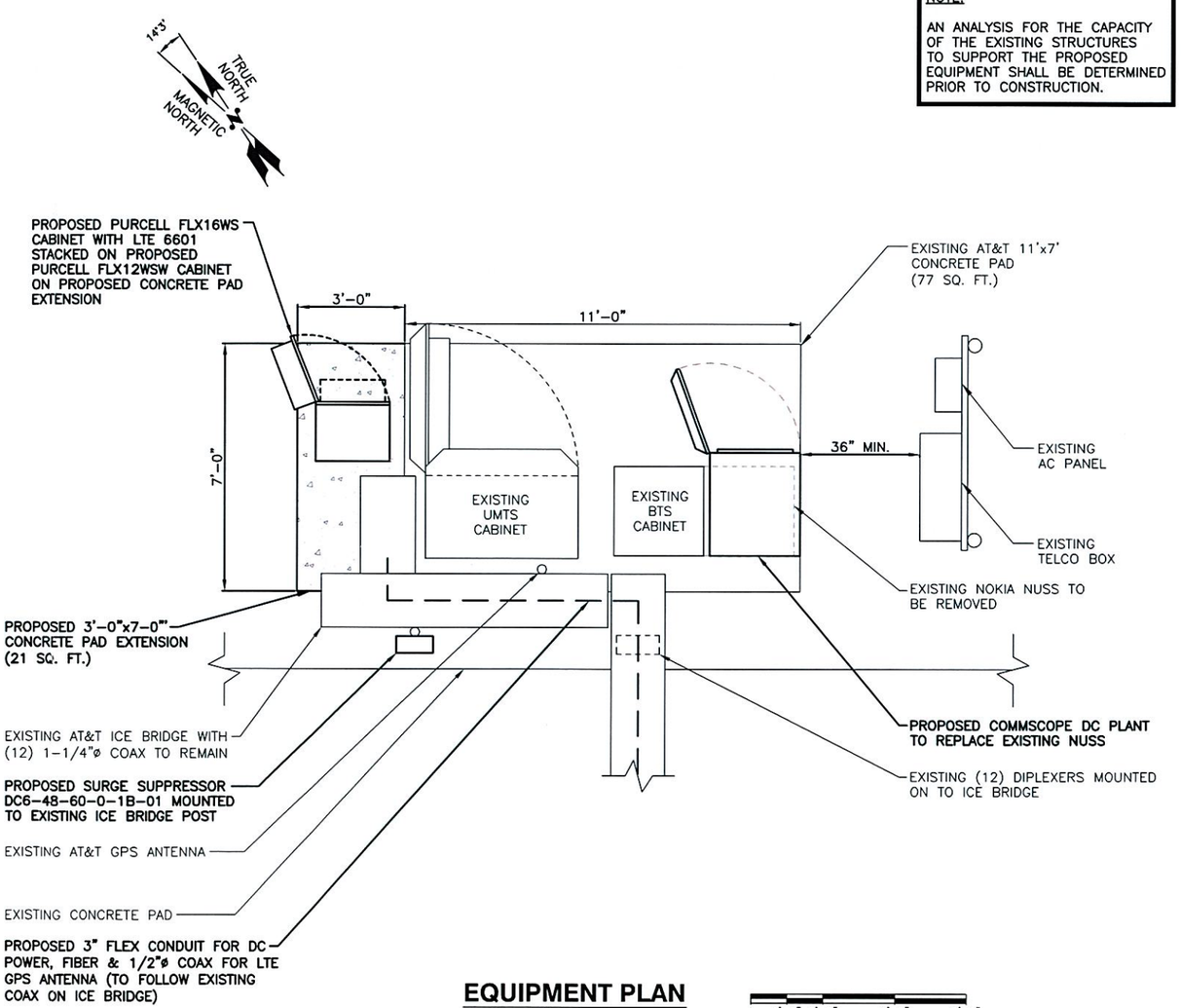
0 2'-8" 5'-4" 10'-8" 16'-0"

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.



EQUIPMENT PLAN

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

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

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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

SITE NUMBER: CT5873
SITE NAME: DEEP RIVER CENTRAL
220 WINTHROP ROAD
DEEP RIVER, CT 06417
MIDDLESEX COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	08/23/12	ISSUED FOR PERMITTING	HC	DC	DPH
0	08/20/12	ISSUED FOR REVIEW	RM	DC	DPH

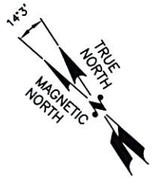
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

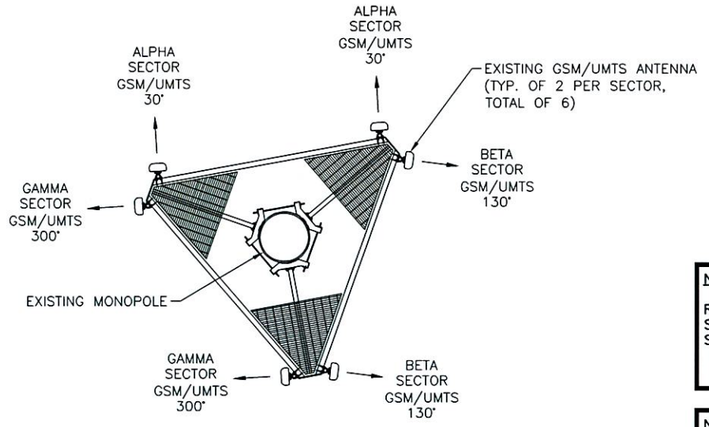
STATE OF CONNECTICUT
ROBERT P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
73.01	A-1	1





EXISTING GSM/UMTS ANTENNA PLAN

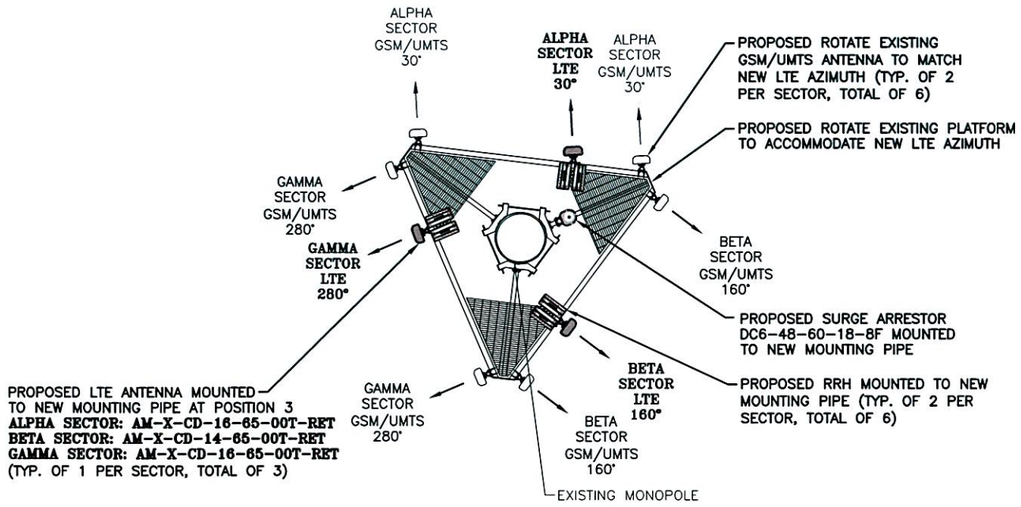
SCALE: N.T.S.

NOTE:

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

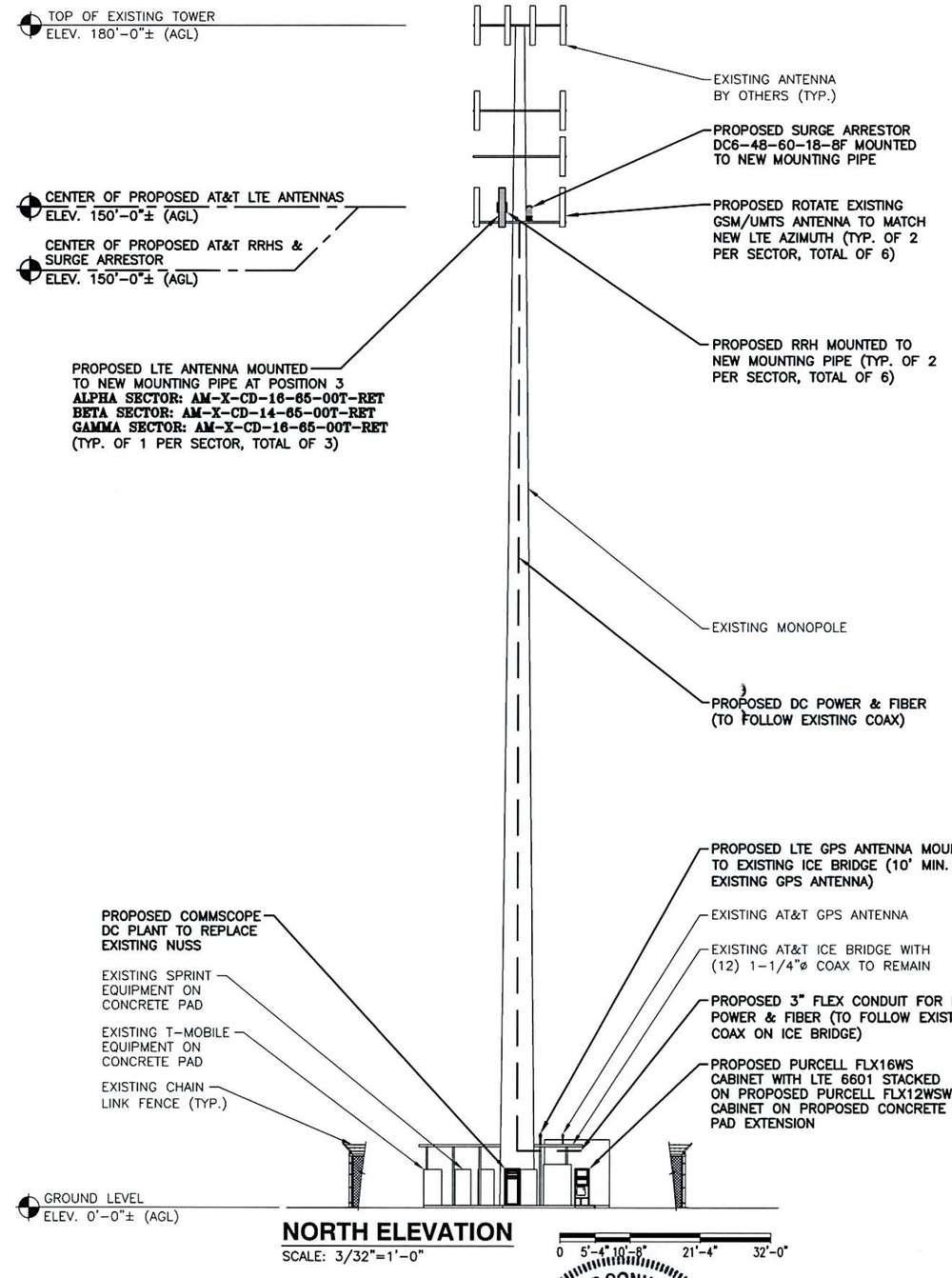
NOTE:

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



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

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

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
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WINDSOR, CT 06095

SITE NUMBER: CT5873
SITE NAME: DEEP RIVER CENTRAL
220 WINTHROP ROAD
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

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

AT&T

ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
13.01	A-2	1

Tower Capacity 83.3%

TowerCo

Date: August 15, 2012

MORRISON HERSHFIELD

Mr. Stephen Rambeau
TowerCo, LLC
5000 Valleystone Drive
Cary, NC 27519
(919) 653-5737

Morrison Hershfield Corporation
66 Perimeter Center East, Ste. 600
Atlanta, GA. 30346
(770) 379-8500

Subject: **Structural Analysis Report**

TowerCo Site Number:	CT2006
TowerCo Site Name:	Deep River – Winthrop Rd
Carrier:	AT&T Mobility
Carrier Site Number:	CT5873
Carrier Site Name:	AWE-Deep River Central
Site Address:	220 Winthrop Road, Deep River, Middlesex County, CT 06417
Site Coordinates:	Latitude 41° 21' 57.14", Longitude -72° 28' 29.46"
Tower Description:	180 ft. – Monopole Tower

Morrison Hershfield Project Number: TC0-128 / 6123226

Dear Mr. Rambeau,

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 1. This analysis has been performed in accordance with the TIA/EIA-222-F *Structural Standards for Antenna Supporting Structures and Antennas* using a fastest mile wind speed of 85 mph and 1/2" radial ice, 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** with the requirements of the above noted standards under the effects of loading described in Table 1.

We at *Morrison Hershfield Corporation* appreciate the opportunity of providing our continuing professional services to you and TowerCo. 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 180 ft. Monopole designed by Valmont in 1998. The tower was originally designed for a wind speed of 85 mph with 1/2" radial ice per TIA/EIA-222-F.

This 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 TIA/EIA-222-F Structural Standards for Antenna Supporting Structures and Antennas using a fastest mile wind speed of 85 mph with no radial ice, 74 mph with 1/2" inch radial ice thickness, and 50 mph under service loads.

The structural analysis was based on the documentation listed in attached Project History.

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 1.

Table 1 – Antenna Loads

Elev. (ft)	QTY.	Antenna/Appurtenance Description	Carrier	Coax QTY.	Coax Size	Notes
		PROPOSED				
150	2	KMW AM-X-CD-16-65-00T Panel Antenna	AT&T Mobility	1 2	10mm 19.7mm	1, 2
	1	KMW AM-X-CD-14-65-00T Panel Antenna				
	6	Ericsson RRUS-11 RRH				
	1	Raycap DC6-48-60-18-8F Surge Arrestor				
		EXISTING				
178	9	Decibel DB844H90E-XY	Sprint/Nextel	9	1-5/8"	2
	1	Platform w/Handrails				
166	6	Decibel DB980H90E-M Panel Antenna	Sprint/Nextel	6	1-5/8"	3, 2
	1	Platform w/Handrails				
158	6	EMS RR90-17-02DP Panel Antenna	T-Mobile	6	1-5/8"	4, 2
	6	Stella Doradus SD-RP1000P (PCS 1900) TMA				
	3	T-Arm Mount				
150	6	Powerwave 7770 Panel Antenna	AT&T Mobility	12	1-1/4"	2, 5
	6	Powerwave LGP21401 TMA				
	1	Low Profile Platform				

Notes:
1. Proposed loading is in addition to the remaining loading at the same elevation. Proposed loading will be installed on the existing low profile platform.
2. Coax is routed inside the tower.
3. For Sprint/Nextel the design loading is not within 2ft. of the existing, thus the existing loading was considered in this analysis.
4. Reserved/lease loading.
5. (3) Powerwave 7770 Panels to be removed and replaced by the proposed.

ANALYSIS PROCEDURE

tnxTower 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.

2.0 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 1.
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.

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.

3.0 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 100% 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 current loading scenario (Table 2).

Tower Section Capacity

Section No.	*Elevation ft*	*Component Type*	*Size*	*% Capacity*	*Pass Fail*
L1	180 - 133.33	Pole	TP30.929x19.36x0.25	58.8	Pass
L2	133.33 - 90.17	Pole	TP41.138x29.2714x0.3438	72.5	Pass
L3	90.17 - 43.92	Pole	TP51.913x39.004x0.4063	74.8	Pass
L4	43.92 - 0	Pole	TP62x49.3455x0.4375	82.6	Pass
				Summary	
			Pole (L4)	82.6	Pass
			RATING =	**82.6**	**Pass**

Capacity of Additional Components

Component	*Capacity (%)*	*Pass/Fail*
Anchor Bolt	72.5	Pass
Base Plate	53.0	Pass
Foundation Overturning	83.3	Pass

4.0 RECOMENDATIONS

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.

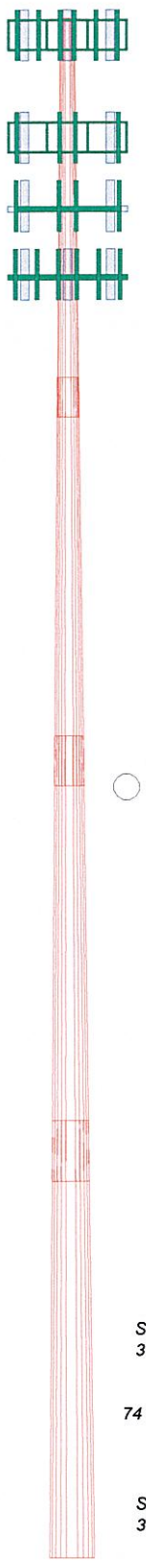
ATTACHMENTS: Project History, Coax Sketch, Tower Profile, Program Output, Foundation Calculations

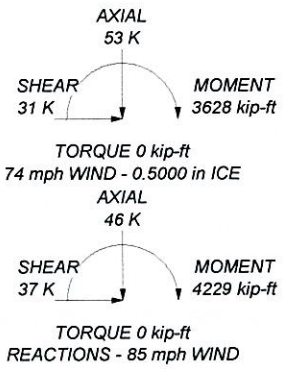
Project History

Project Number TC0-128
TowerCo Site ID: CT2006
TowerCo Site Name: Deep River – Winthrop Rd

Tower Document	Structure and Document ID	Issued By	Issued To	Issued Date	Description
242224	CT2006_Deep_River-Winthrop_Rd_PCHV	Aaron Sucy	-	1/17/2007	Height Verification
242242	CT2006_Deep_River-Winthrop_Rd_Geotechnical_Report_-_07-13-1998	Tectonic Engineering Consultants	Nextel Communications	7/13/1998	Geotechnical Report
511989	CT2006_Deep_River-winthrop_Rd_Tower_Design_Drawings_-_06-23-1998	Valmont Industries, Inc.	Nextel Communications	6/22/1998	Tower Design Drawings
511999	CT2006_Deep_River-winthrop_Rd_Tower_Design_Calculations_-_10-27-2000	Valmont Industries, Inc.	Nextel Communications	10/27/2000	Tower Design Calculations
512094	CT2006_Deep_River-winthrop_Rd_Foundation_Design	Towerkraft Engineering	Valmont Industries, Inc.	8/11/1998	Foundation Design Drawings
513067	CT2006_Deep_River-winthrop_Rd__Semaan_Structural_AT&T_Reconfiguration_20081204	Semaan Engineering Solutions	TowerCo	12/4/2008	Structural Analysis
708803	CT2006_Deep_River-winthrop_Rd_Site_Plan	SiteMaster	TowerCo	10/31/2008	Site Plan
714945	CT2006_Deep_River-winthrop_Rd_Tower_Profile	SiteMaster	TowerCo	10/31/2008	Tower Profile
719725	CT2006_Deep_River-winthrop_Rd_SiteMaster_Inspection_Report	SiteMaster	TowerCo	10/31/2008	Tower Inspection Report
723654	CT2006_Deep_River-Winthrop_Rd_Foundation_Design_Drawing_-_08-11-1998	Valmont Industries, Inc.	Nextel Communications	8/11/1998	Foundation Design Drawings

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	46.67	12	0.2500	4.67	19.3800	30.9290		3.2
2	47.83	12	0.3438	5.83	29.2714	41.1380		6.3
3	52.08	12	0.4063	7.08	39.0040	51.9130		10.4
4	51.00	12	0.4375		49.3455	62.0000		13.5
							A572-65	33.4





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	178	(2) SD-RP1000P (PCS 1900) (T-Mobile)	158
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	178	T-Arm (T-Mobile)	158
		T-Arm (T-Mobile)	158
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	178	T-Arm (T-Mobile)	158
		7770.00 w/ pipe mount (ATI Mobility)	150
Platform w/ Handrails (Sprint/Nextel)	178	7770.00 w/ pipe mount (ATI Mobility)	150
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	166	7770.00 w/ pipe mount (ATI Mobility)	150
		(2) LGP21401 (ATI Mobility)	150
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	166	(2) LGP21401 (ATI Mobility)	150
		(2) LGP21401 (ATI Mobility)	150
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	166	AM-X-CW-14-65-00T-RET w/ pipe mount (ATI Mobility)	150
Platform w/ Handrails (Sprint/Nextel)	166		
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	158	AM-X-CD-16-65-00T-RET w/ pipe mount (ATI Mobility)	150
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	158	AM-X-CD-16-65-00T-RET w/ pipe mount (ATI Mobility)	150
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	158	(2) RRUS-11 (ATI Mobility)	150
		(2) RRUS-11 (ATI Mobility)	150
(2) SD-RP1000P (PCS 1900) (T-Mobile)	158	(2) RRUS-11 (ATI Mobility)	150
		DC6-48-60-18-8F Squid (ATI Mobility)	150
(2) SD-RP1000P (PCS 1900) (T-Mobile)	158	LP Platform (ATI Mobility)	150

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 82.6%

Morrison Hershfield Corp
66 Perimeter Center East Ste. 600
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501
Consulting Engineers

Job: CT2006-ERP		
Project: ENGMH-205 (82.6%)		
Client: TowerCo	Drawn by: acrotty	App'd:
Code: TIA/EIA-222-F	Date: 08/15/12	Scale: NTS
Path: P:\Projects\Tower Projects\TowerCo-Analyses\TC0-128 CT2006\TC0-128 SA\Analysis\CT2006-ERP.eri		Dwg No. E-1

tnxTower	Job	Page
	CT2006-ERP	1 of 4
Morrison Hershfield Corp 66 Perimeter Center East Ste. 600 Atlanta, GA 30346 Phone: (770) 379-8500 FAX: (770) 379-8501	**Project** ENGMH-205 (82.6%)	**Date** 17:18:15 08/15/12
	Client TowerCo	**Designed by** acrotty

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 Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, 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	180.00-133.33	46.67	4.67	12	19.3600	30.9290	0.2500	1.0000	A572-65 (65 ksi)
L2	133.33-90.17	47.83	5.83	12	29.2714	41.1380	0.3438	1.3752	A572-65 (65 ksi)
L3	90.17-43.92	52.08	7.08	12	39.0040	51.9130	0.4063	1.6252	A572-65 (65 ksi)
L4	43.92-0.00	51.00		12	49.3455	62.0000	0.4375	1.7500	A572-65 (65 ksi)

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8 (Sprint/Nextel)	A	No	Inside Pole	178.00 - 9.00	9	No Ice	0.00	1.04
*****						1/2" Ice	0.00	1.04
1 5/8 (Sprint/Nextel)	A	No	Inside Pole	166.00 - 9.00	6	No Ice	0.00	1.04
*****						1/2" Ice	0.00	1.04
1 5/8 (T-Mobile)	B	No	Inside Pole	158.00 - 9.00	6	No Ice	0.00	1.04
*****						1/2" Ice	0.00	1.04
1 1/4 (AT&T Mobility)	C	No	Inside Pole	150.00 - 9.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
DC Power Cable (0.795") (AT&T Mobility)	C	No	Inside Pole	150.00 - 9.00	2	No Ice	0.00	0.88
						1/2" Ice	0.00	0.88
Fiber (0.364") (AT&T Mobility)	C	No	Inside Pole	150.00 - 9.00	1	No Ice	0.00	0.12
						1/2" Ice	0.00	0.12

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	A	From Leg	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	B	From Leg	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
(3) DB844H90E-XY w/Mount Pipe (Sprint/Nextel)	C	From Leg	3.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
Platform w/ Handrails (Sprint/Nextel)	C	None		0.0000	178.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
*****									
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	A	From Leg	3.00 0.00 0.00	0.0000	166.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	B	From Leg	3.00 0.00 0.00	0.0000	166.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07
(2) DB980H90E-M w/Mount Pipe (Sprint/Nextel)	C	From Leg	3.00 0.00 0.00	0.0000	166.00	No Ice 1/2" Ice	4.27 4.86	3.86 4.95	0.03 0.07
Platform w/ Handrails (Sprint/Nextel)	C	None		0.0000	166.00	No Ice 1/2" Ice	31.30 40.20	31.30 40.20	1.82 2.45
*****									
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	0.04 0.08
(2) RR90-17-02DP w/Mount Pipe (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	4.91 5.57	3.64 4.70	0.04 0.08
(2) RR90-17-02DP w/Mount	C	From Leg	3.00	0.0000	158.00	No Ice	4.91	3.64	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
Pipe			0.00			1/2" Ice	5.57	4.70	0.08
(T-Mobile)			0.00						
(2) SD-RP1000P (PCS 1900)	A	From Leg	3.00	0.0000	158.00	No Ice	0.57	0.14	0.00
(T-Mobile)			0.00			1/2" Ice	0.67	0.20	0.00
			0.00						
(2) SD-RP1000P (PCS 1900)	B	From Leg	3.00	0.0000	158.00	No Ice	0.57	0.14	0.00
(T-Mobile)			0.00			1/2" Ice	0.67	0.20	0.00
			0.00						
(2) SD-RP1000P (PCS 1900)	C	From Leg	3.00	0.0000	158.00	No Ice	0.57	0.14	0.00
(T-Mobile)			0.00			1/2" Ice	0.67	0.20	0.00
			0.00						
T-Arm	A	From Leg	2.00	0.0000	158.00	No Ice	10.54	10.54	0.34
(T-Mobile)			0.00			1/2" Ice	14.46	14.46	0.41
			0.00						
T-Arm	B	From Leg	2.00	0.0000	158.00	No Ice	10.54	10.54	0.34
(T-Mobile)			0.00			1/2" Ice	14.46	14.46	0.41
			0.00						
T-Arm	C	From Leg	2.00	0.0000	158.00	No Ice	10.54	10.54	0.34
(T-Mobile)			0.00			1/2" Ice	14.46	14.46	0.41
			0.00						
*****									
7770.00 w/ pipe mount	A	From Leg	3.00	40.0000	150.00	No Ice	6.22	4.35	0.06
(AT&T Mobility)			0.00			1/2" Ice	6.77	5.20	0.11
			0.00						
7770.00 w/ pipe mount	B	From Leg	3.00	40.0000	150.00	No Ice	6.22	4.35	0.06
(AT&T Mobility)			0.00			1/2" Ice	6.77	5.20	0.11
			0.00						
7770.00 w/ pipe mount	C	From Leg	3.00	30.0000	150.00	No Ice	6.22	4.35	0.06
(AT&T Mobility)			0.00			1/2" Ice	6.77	5.20	0.11
			0.00						
(2) LGP21401	A	From Leg	3.00	0.0000	150.00	No Ice	1.29	0.23	0.01
(AT&T Mobility)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00						
(2) LGP21401	B	From Leg	3.00	0.0000	150.00	No Ice	1.29	0.23	0.01
(AT&T Mobility)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00						
(2) LGP21401	C	From Leg	3.00	0.0000	150.00	No Ice	1.29	0.23	0.01
(AT&T Mobility)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00						
AM-X-CW-14-65-00T-RET	A	From Leg	3.00	40.0000	150.00	No Ice	5.74	4.02	0.06
w/ pipe mount			0.00			1/2" Ice	6.20	4.63	0.10
(AT&T Mobility)			0.00						
AM-X-CD-16-65-00T-RET	B	From Leg	3.00	40.0000	150.00	No Ice	8.50	6.30	0.08
w/ pipe mount			0.00			1/2" Ice	9.15	7.48	0.15
(AT&T Mobility)			0.00						
AM-X-CD-16-65-00T-RET	C	From Leg	3.00	30.0000	150.00	No Ice	8.50	6.30	0.08
w/ pipe mount			0.00			1/2" Ice	9.15	7.48	0.15
(AT&T Mobility)			0.00						
(2) RRUS-11	A	From Leg	3.00	0.0000	150.00	No Ice	2.94	1.25	0.06
(AT&T Mobility)			0.00			1/2" Ice	3.17	1.41	0.07
			0.00						
(2) RRUS-11	B	From Leg	3.00	0.0000	150.00	No Ice	2.94	1.25	0.06
(AT&T Mobility)			0.00			1/2" Ice	3.17	1.41	0.07
			0.00						
(2) RRUS-11	C	From Leg	3.00	0.0000	150.00	No Ice	2.94	1.25	0.06
(AT&T Mobility)			0.00			1/2" Ice	3.17	1.41	0.07
			0.00						

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
DC6-48-60-18-8F Squid (AT&T Mobility)	C	From Leg	1.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice	1.60 1.81	1.60 1.81	0.03 0.05
LP Platform (AT&T Mobility)	C	None		0.0000	150.00	No Ice 1/2" Ice	18.01 23.33	18.01 23.33	1.12 1.35

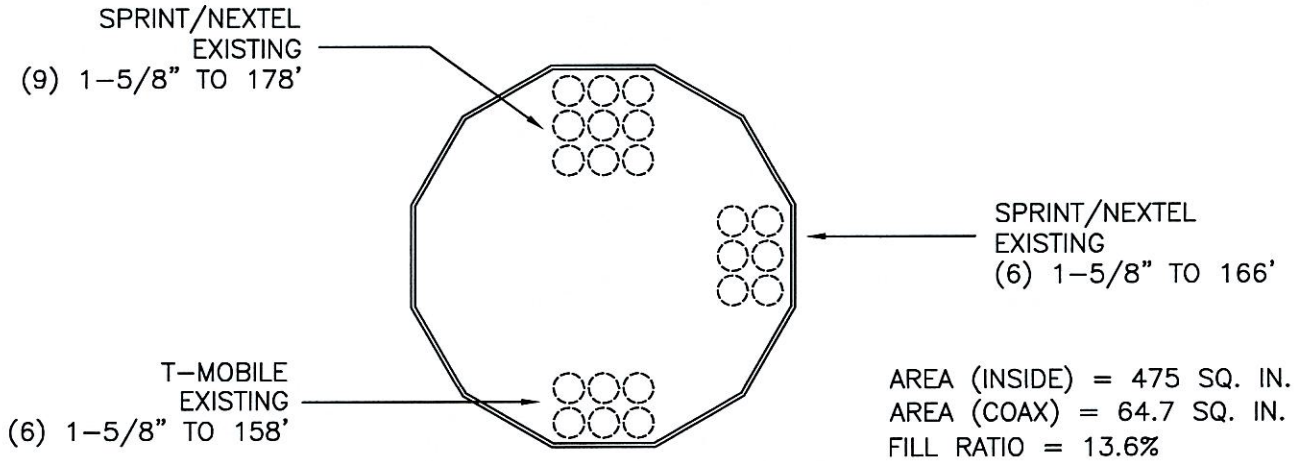
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	180 - 133.33	Pole	TP30.929x19.36x0.25	1	-9.60	1235.46	58.8	Pass
L2	133.33 - 90.17	Pole	TP41.138x29.2714x0.3438	2	-16.87	2264.53	72.5	Pass
L3	90.17 - 43.92	Pole	TP51.913x39.004x0.4063	3	-28.48	3354.99	74.8	Pass
L4	43.92 - 0	Pole	TP62x49.3455x0.4375	4	-45.68	4137.43	82.6	Pass
							Summary	
						Pole (L4)	82.6	Pass
						RATING =	**82.6**	**Pass**

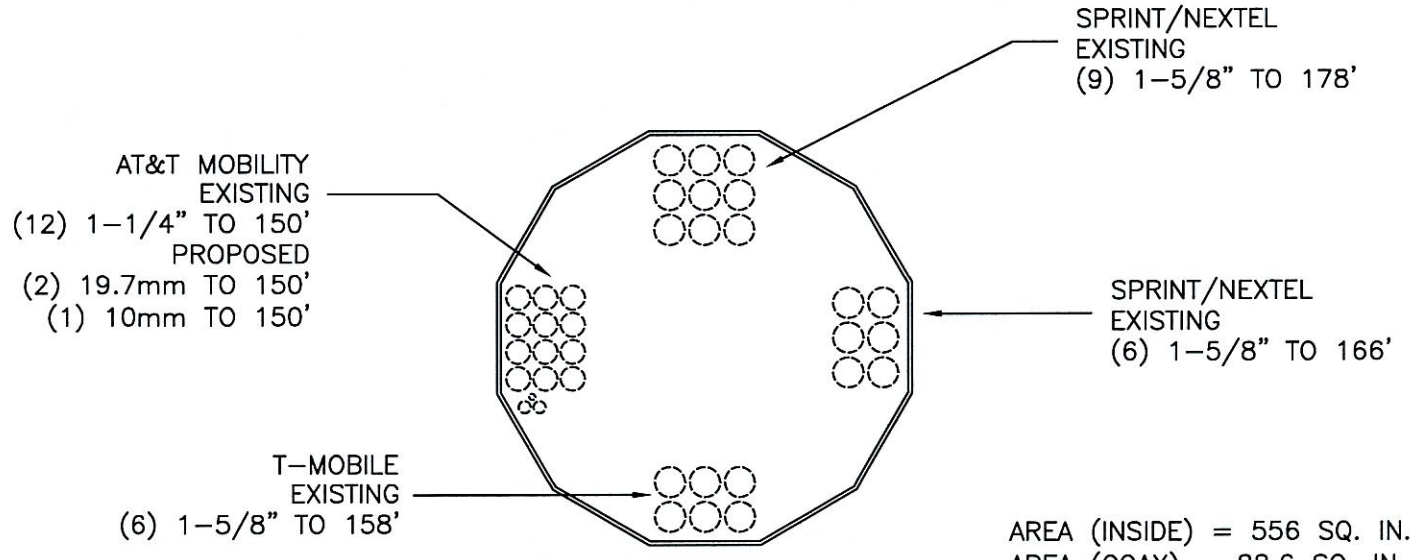
NOTE: ACTUAL LOCATIONS OF EXISTING CABLES MAY VARY FROM THE LAYOUT SHOWN. PLEASE CONTACT MORRISON HERSHFIELD PRIOR TO INSTALLING PROPOSED LINES IF LAYOUT IS SUBSTANTIALLY DIFFERENT FROM THAT SHOWN.

MORRISON HERSHFIELD
66 Perimeter Center East, Suite 600 Atlanta, GA 30346
Tel: (770) 379 8500 Fax: (770) 379 8501
www.morrisonhershfield.com

Project: TOWERCO CT2006 / ENGMH-205 TCO-128



COAX CONFIGURATION PLAN - 158.0FT

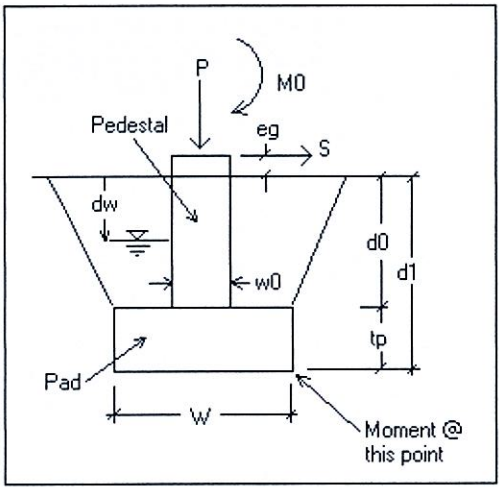


COAX CONFIGURATION PLAN - 150.0FT

ANALYSIS OF SPREAD FOOTING: OVERTURNING / BEARING

Engr = "SAC"

JobDescription = "CT2006-ERP"



$P = 46\,kip$ Compression load on foundation; does not include soil or concrete weight

$M_0 = 4.229 \times 10^3\,kip \cdot ft$ Moment load on foundation

$S = 37\,kip$ Shear load on foundation

$\sigma_b = 30\,\frac{ton}{ft^2}$ Allowable bearing pressure

$inet = 1$ For allw. bearing(0=Gross, 1=Net); Net ignores fdn and soil weight for computed bearing pressure.

$FOS_{REQ} = 1.5$ Required FOS against overturning

INPUT:

$w_0 = 27\,ft$ Pedestal width

$iped = 1$ Pedestal type (0=round, 1=square)

$d_0 = 0$ Depth to top of pad

$d_s = 0$ Depth to soil uplift cone (0=no cone, normally d0)

$d_n = 20\,ft$ Depth of water to neglect for passive pr.

$d_w = 1.75\,ft$ Depth of water; 0 = no water

$e_g = 4.25\,ft$ Extension above grade

$t_p = 0.75\,ft$ Pad thickness

$W = 27\,ft$ Pad width (W x W)

$\gamma_c = 150\,pcf$ Concrete density

$\gamma_s = 130\,pcf$ Soil density

$\phi_s = 0\,deg$ Soil angle of friction

RESULTS

$W_{s1} = 0.00\,kip$ Weight of soil directly above pad

$W_c = 546.75\,kip$ Total weight of foundation (accounts for buoyancy, if applicable)

$M_r = 7.944 \times 10^3\,kip \cdot ft$ Total resisting moment

$M_t = 4.414 \times 10^3\,kip \cdot ft$ Total applied moment

FOS = 1.80 Factor of safety against overturning Result = "Foundation is OK for overturning"

C Squared Systems, LLC
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support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT5873

(Deep River Central)

220 Winthrop Road, Deep River, CT 06417

August 24, 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 located at 220 Winthrop Road in Deep River, CT. The coordinates of the tower are 41° 21' 57.1" N, 72° 28' 29.2" W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (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	150	880	1	500	0.0080	0.5867	1.36%
AT&T GSM	150	1900	2	427	0.0136	1.0000	1.36%
AT&T GSM	150	880	4	296	0.0189	0.5867	3.23%
Nextel	178	851	9	100	0.0102	0.5673	1.80%
Sprint	167	1962.5	11	374.5	0.0531	1.0000	5.31%
VoiceStream	160	1930	4	275	0.0155	1.0000	1.55%
AT&T UMTS	150	880	2	565	0.0018	0.5867	0.31%
AT&T UMTS	150	1900	2	875	0.0028	1.0000	0.28%
AT&T LTE	150	734	1	1313	0.0021	0.4893	0.43%
AT&T GSM	150	880	1	283	0.0005	0.5867	0.08%
AT&T GSM	150	1900	4	525	0.0034	1.0000	0.34%
						Total	**10.09%**

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 7/26/2012. 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 Morrison Hershfield Corporation structural analysis dated 8/15/2012.

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 **10.09% 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

August 24, 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.

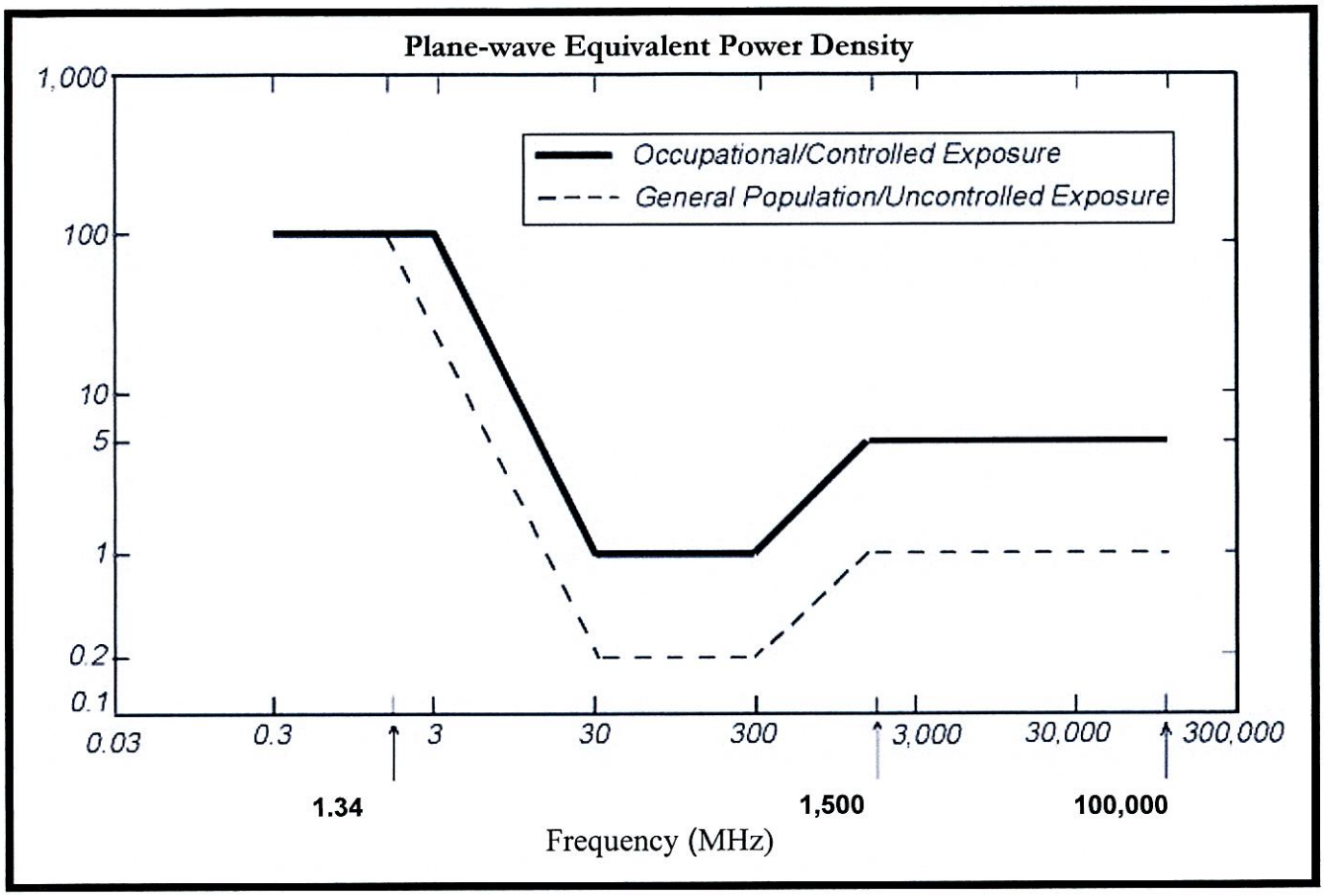
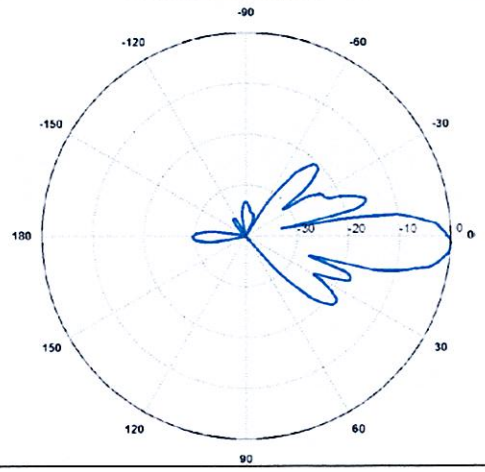


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

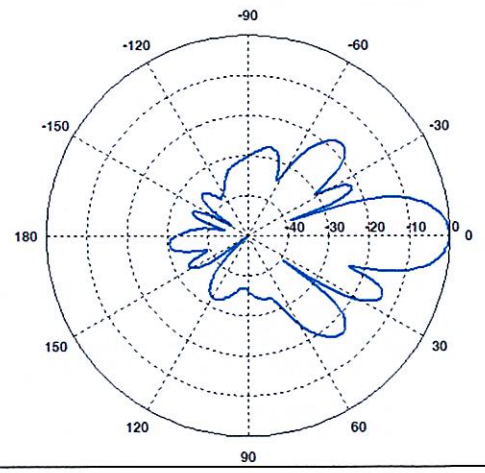
700 MHz

Manufacturer:	KMW
Model #:	AM-X-CD-16-65-00T-RET
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ±45°
Size L x W x D:	72.0" x 11.8" x 5.9"



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"