

# 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](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

November 9, 2012

John Lawrence  
New Cingular Wireless PCS, LLC  
95 Ryan Drive, Suite #1  
Raynham, MA 02767

RE: **EM-CING-069-121025** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 79 Putnam Pike, Killingly, Connecticut.

Dear Mr. Lawrence:

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:

- The antennas and remote radio heads shall be installed in accordance with the recommendations made in the Structural Analysis Report prepared by Hudson Design Group dated October 18, 2012 and stamped by Daniel Hamm; and
- Not more than 45 days following the installation of the proposed equipment, AT&T shall provide documentation certifying that the installation complied with the engineer's recommendation.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 24, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency

emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

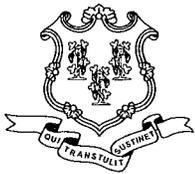
Very truly yours,



Linda Roberts  
Executive Director

LR/CDM/cm

c: The Honorable Dennis Alemian, Chairman Town Council, Town of Killingly  
Bruce E. Benway, Town Manager, Town of Killingly  
Roger Gandolf, Zoning Officer, Town of Killingly



# STATE OF CONNECTICUT

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E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

October 25, 2012

The Honorable Dennis Alemian  
Chairman Town Council  
Town of Killingly  
P. O. Box 6000  
Danielson, CT 06239-6000

RE: **EM-CING-069-121025** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 79 Putnam Pike, Killingly, Connecticut.

Dear Chairman Town Council Alemian:

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 November 8, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts  
Executive Director

LR/cm

c: Bruce E. Benway, Town Manager, Town of Killingly  
Roger Gandolf, Zoning Officer, Town of Killingly



**New Cingular Wireless  
PCS, LLC**  
500 Enterprise Drive  
Rocky Hill, Connecticut 06067

**John Lawrence**  
Real Estate Consultant  
95 Ryan Drive, Suite #1  
Raynham, MA 02767  
Phone: (781) 715-5532  
[jl.lawrence@cingular.com](mailto:jl.lawrence@cingular.com)

ORIGINAL

RECEIVED  
OCT 25 2012

CONNECTICUT  
SITING COUNCIL

October 24, 2012

Honorable Robert Stein, Chairman,  
and Members of the Connecticut Siting Council  
Connecticut Siting Council  
10 Franklin Square  
New Britain, Connecticut 06051

**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 79  
Putnam Pike, Dayville CT 06241**

Dear Chairman Stein and Members of the Council:

New Cingular Wireless PCS, LLC (“AT&T”) intends to modify the existing telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 79 Putnam Pike, Dayville CT. AT&T operates under licenses issued by the Federal Communications Commission (“FCC”) to provide cellular and PCS mobile telephone service in Windham County, which includes the area to be served by AT&T’s proposed installation.

In order to accommodate technological changes, implement Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) plans to modify the equipment configurations at many of its existing cell sites. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Please accept this letter as notification to the Council, 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 is being sent to Bruce E. Benway, Town Manager

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T’s operations at the site. Also included is documentation of the

structural sufficiency of the tower to accommodate the revised antenna configuration.

### **Existing Facility**

The Dayville facility is located at 79 Putnam Pike, Dayville CT 06241

The facility is owned by TowerCo.

The existing facility consists of a 150' monopole with an existing chain link fence around the tower compound. AT&T currently operates wireless communications equipment at the facility and has six (6) antennas mounted at the tower centerline height of 130'.

### **Statutory Considerations**

The changes to the Dayville tower 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 or altered. 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) because they will not result in any substantial adverse environmental effect.

1. The height of the overall structure will be unaffected.
2. The proposed changes will not affect the property boundaries. All new construction will take place inside the existing fenced compound.
3. The proposed additions will not increase the noise level at the existing facility by six decibels or more.
4. LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes 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.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully yours,



John Lawrence  
Real Estate Consultant  
Enclosures:

Bruce E. Benway, Town Manager, Town of Killingly



**New Cingular Wireless  
PCS, LLC**  
500 Enterprise Drive  
Rocky Hill, Connecticut 06067

**John Lawrence**  
Real Estate Consultant  
95 Ryan Drive, Suite #1  
Raynham, MA 02767  
Phone: (781) 715-5532  
jlawrence@clinellc.com

October 24, 2012

Bruce E. Benway, Town Manager  
Town of Killingly  
172 Main Street  
Danielson, CT 06239

**Re: Notice of Exempt Modification – Existing Telecommunications Facility at 79  
Putnam Pike, Dayville CT 06241**

Dear Mr. Benway,

New Cingular Wireless PCS, LLC (“AT&T”) intends to replace telecommunications antennas and associated equipment at an existing telecommunications tower, owned and operated by Tower CO.

A Notice of Exempt Modification has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73. Please accept this letter as notification to the Town of Killingly under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The attached letter fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council’s procedures, please contact John Lawrence at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

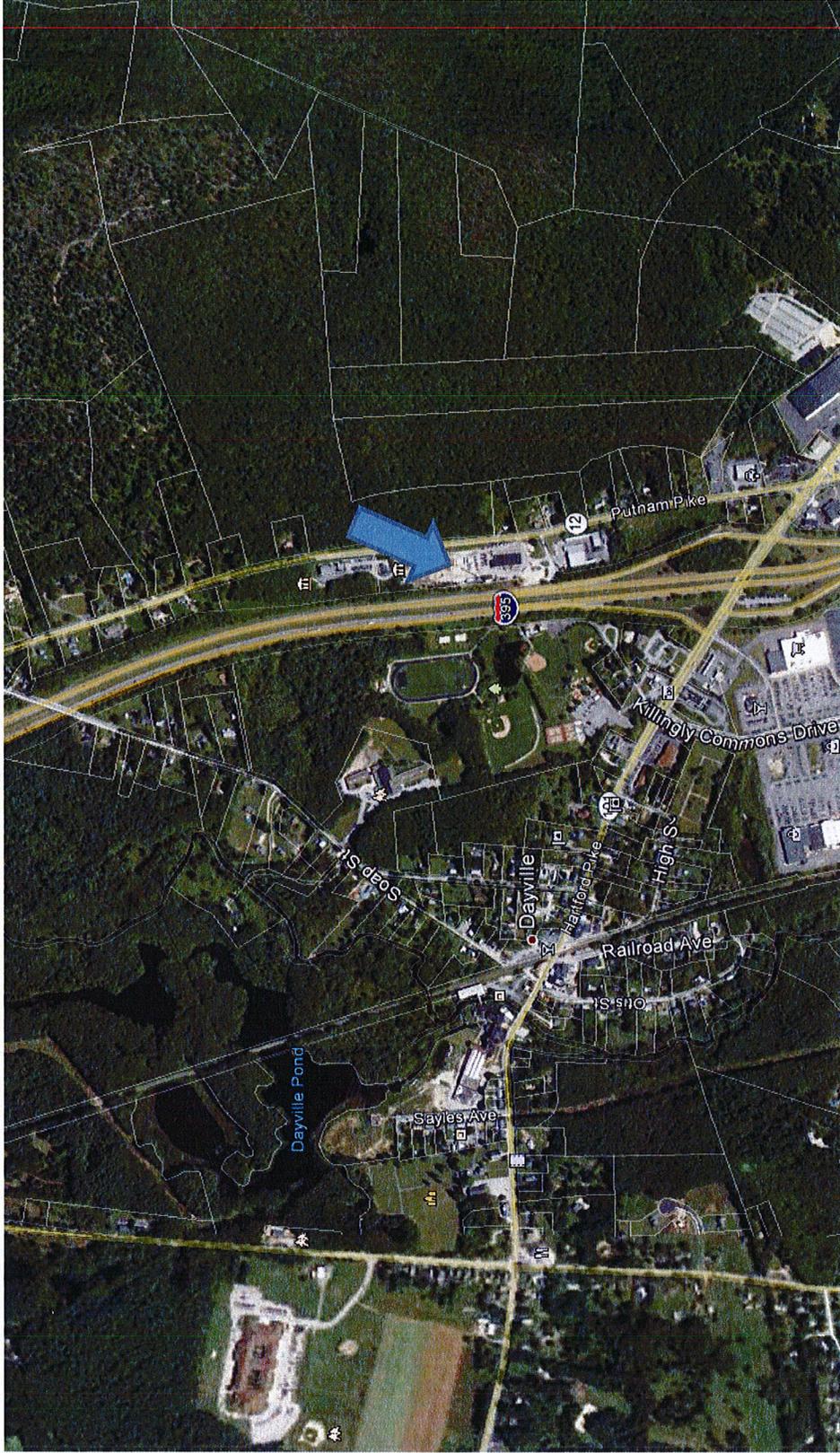
John Lawrence  
Real Estate Consultant

Enclosure

CC: Honorable Robert Stein, Chairmen of the Connecticut Siting Council

**CT5463**

**Aerial Location Map**



**Street Location Map**





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

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Calculated Radio Frequency Emissions



at&t

CT5463

(Killingly North)

79 Putnam Pike, Dayville, CT 06241

a.k.a. (Killingly – 79 Putnam Turnpike)

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October 23, 2012

## Table of Contents

1. Introduction.....	1
2. FCC Guidelines for Evaluating RF Radiation Exposure Limits.....	1
3. RF Exposure Prediction Methods.....	2
4. Calculation Results.....	3
5. Conclusion.....	4
6. Statement of Certification.....	4
Attachment A: References.....	5
Attachment B: FCC Limits for Maximum Permissible Exposure (MPE).....	6
Attachment C: AT&T Antenna Data Sheets and Electrical Patterns.....	8

## List of Tables

Table 1: Carrier Information.....	3
Table 2: FCC Limits for Maximum Permissible Exposure (MPE).....	6

## List of Figures

Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE).....	7
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## 1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the monopole tower located on 79 Putnam Pike in Dayville, CT. The coordinates of the tower are 41° 50' 50.68" N, 71° 52' 44.24" 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 ( $\text{mW}/\text{cm}^2$ ). 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:

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

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 patterns 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 <sup>2</sup> )	Limit	%MPE
Cingular GSM	130	1900	2	427	0.0182	1.0000	1.82%
Cingular GSM	130	880	4	296	0.0252	0.5867	4.29%
Cingular UMTS	130	880	1	500	0.0106	0.5867	1.81%
Verizon	108	880	6	485	0.0897	0.5867	15.29%
Verizon	108	1900	9	393	0.1090	1.0000	10.90%
MetroPCS	98	2140	3	443.61	0.0498	1.0000	4.98%
VoiceStream	150	1930	4	250	0.0160	1.0000	1.60%
Sprint	140	1962.5	4	250	0.0183	1.0000	1.83%
Town	118	155.72	4	200	0.0207	0.2000	10.33%
Town	86	155.74	4	200	0.0389	0.2000	19.45%
AT&T UMTS	130	880	2	565	0.0024	0.5867	0.41%
AT&T UMTS	130	1900	2	875	0.0037	1.0000	0.37%
AT&T LTE	130	734	1	1771	0.0038	0.4893	0.77%
AT&T GSM	130	880	1	283	0.0006	0.5867	0.10%
AT&T GSM	130	1900	4	525	0.0045	1.0000	0.45%
						<b>Total</b>	<b>66.49%</b>

**Table 1: Carrier Information**<sup>1 2 3</sup>

<sup>1</sup> The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 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.

<sup>2</sup> 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.

<sup>3</sup> Antenna height listed for AT&T is in reference to the Hudson Design Group Structural Analysis dated October 18, 2012.

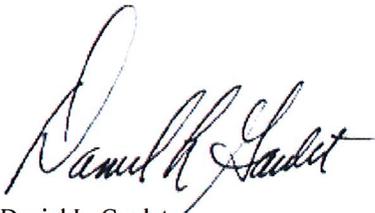
## 5. Conclusion

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 **66.49% 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

October 23, 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<sup>4</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	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<sup>5</sup>**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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)**

<sup>4</sup> 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.

<sup>5</sup> 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.

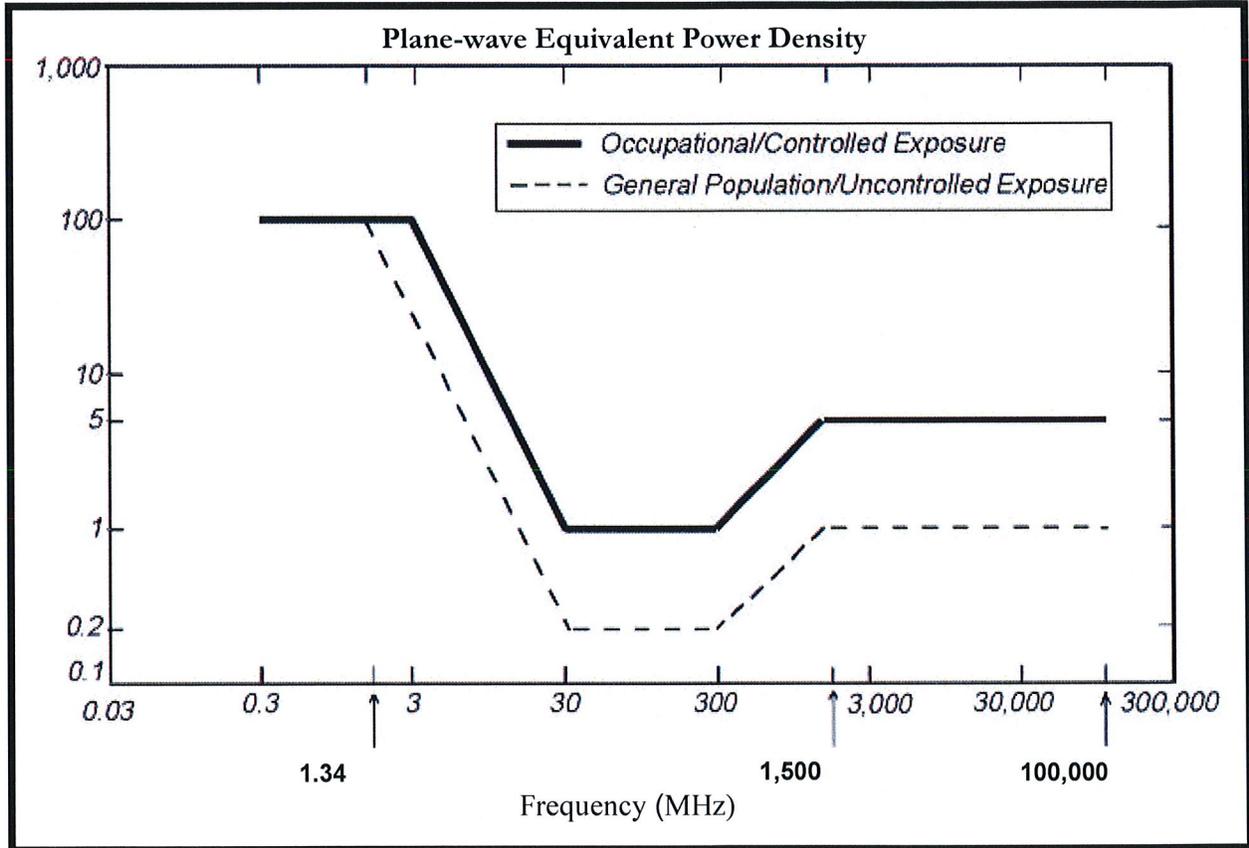
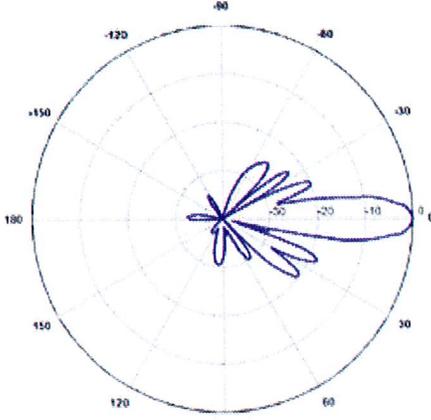
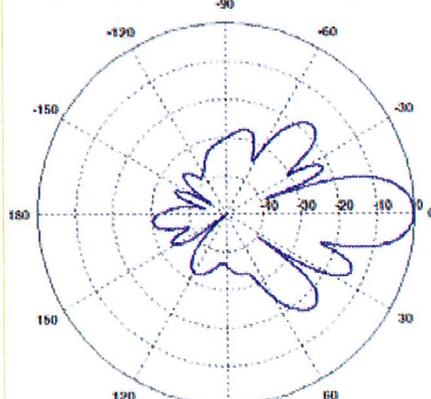
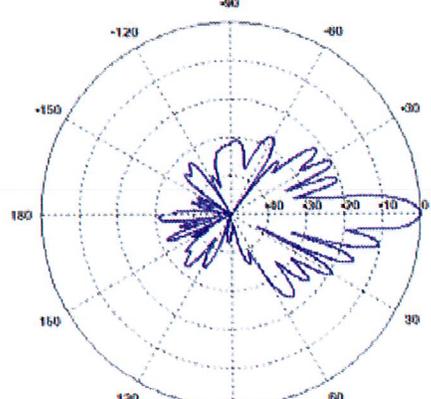


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

<p><b>700 MHz</b></p> <p>Manufacturer: KMW            Model #: AM-X-CD-17-65-00T-RET            Frequency Band: 698-806 MHz            Gain: 14.65 dBd            Vertical Beamwidth: 10°            Horizontal Beamwidth: 66°            Polarization: Dual Slant ± 45°            Size L x W x D: 96.0" x 11.8" x 6.0"</p>	
<p><b>850 MHz</b></p> <p>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" x 11.0" x 5.0"</p>	
<p><b>1900 MHz</b></p> <p>Manufacturer: Powerwave            Model #: 7770.00            Frequency Band: 1850-1990 MHz            Gain: 13.4 dBd            Vertical Beamwidth: 7°            Horizontal Beamwidth: 86°            Polarization: ± 45°            Size L x W x D: 55" x 11.0" x 5.0"</p>	

# STRUCTURAL ANALYSIS REPORT

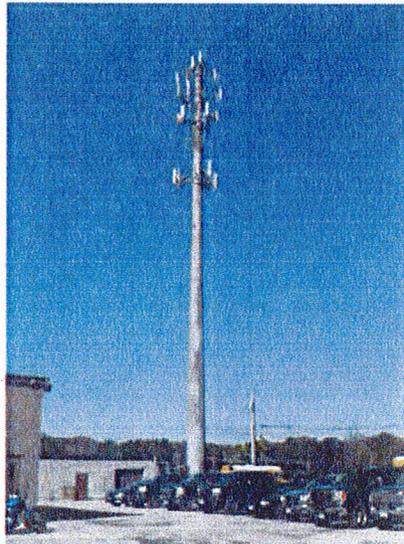
For

**CT5463**

**KILLINGLY NORTH**

79 Putnam Pike  
Dayville, CT 06241

## Antennas Mounted to the Monopole



Prepared for:



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



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

Dated: October 18, 2012

Prepared by:



1600 Osgood Street Building 20 North, Suite 3090  
North Andover, MA 01845

Phone: (978) 557-5553

[www.hudsondesigngroupllc.com](http://www.hudsondesigngroupllc.com)





**SCOPE OF WORK:**

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 150' monopole supporting the proposed AT&T antennas located at elevation 130' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's existing and proposed antennas listed below.

Manufacturer drawing of the existing monopole prepared by Fred A. Nudd Corporation, dated July 24, 1998 was available and obtained for our use. This office conducted an on-site visual survey and tower mapping on October 1, 2012 to record dimensional properties of the existing monopole and its appurtenances. Attendees included Bradley Loeb (HDG - Associate) and Nick Marshall (HDG - Associate).

**CONCLUSION SUMMARY:**

Based on our evaluation, we have determined that the existing monopole is in conformance with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at 77.0% - (Pole Section L6 from El.40' to El.51' Controlling).



**APPURTENANCES CONFIGURATION:**

Tenant	Appurtenances	Elev.	Mount
	Lighting Rod	152.5'	Top of Monopole
	(2) 4' Omni	153'	10.5' Pipe
	(6) RV90-17-02DP Antennas	149'	12' T-Frame
	(6) TMA	149'	12' T-Frame
	(6) DB980H90E-M Antennas	138'	12' T-Frame
<b>AT&amp;T</b>	(6) Powerwave 7770 Antennas	130'	Low Profile Platform
<b>AT&amp;T</b>	(6) LGP 21400 TMA	130'	Low Profile Platform
<b>AT&amp;T</b>	(6) LGP 21900	130'	Low Profile Platform
<b>AT&amp;T</b>	(3) DAS-HY-DFDM	130'	Low Profile Platform
<b>AT&amp;T</b>	<b>(3) AM-X-CD-17-65 Antennas</b>	130'	Low Profile Platform
<b>AT&amp;T</b>	<b>(6) RRHs</b>	130'	Ring Mount
<b>AT&amp;T</b>	<b>Surge Arrestor DC6-48-60-18-8F</b>	128'	Ring Mount
	4' Omni	124.3'	6' Side Mount Standoff
	4' Omni	123.7'	6' Side Mount Standoff
	(6) LPA-185063-12CF Antennas	106'	Low Profile Platform
	(6) LPA-80063-6CF Antennas	106'	Low Profile Platform

\*Proposed AT&T Appurtenances shown in Bold.

**AT&T EXISTING/PROPOSED COAX CABLES:**

Tenant	Coax Cables	Elev.	Mount
<b>AT&amp;T</b>	(12) 1 5/8" Cables	130'	Inside Monopole
<b>AT&amp;T</b>	<b>Fiber Cable</b>	130'	Inside Monopole
<b>AT&amp;T</b>	<b>(2) DC Power Cables</b>	130'	Inside Monopole

\*Proposed AT&T Coax Cables shown in Bold.

**ANALYSIS RESULTS SUMMARY:**

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	11.8 %	130 - 150	PASS	
Pole Section-L2	40.4 %	115 - 130	PASS	
Pole Section-L1	44.9 %	95 - 115	PASS	
Pole Section-L4	56.6 %	91 - 95	PASS	
Pole Section-L5	65.0 %	51 - 91	PASS	
Pole Section-L6	<b>77.0 %</b>	40 - 51	PASS	<b>Controlling</b>
Pole Section-L7	65.5 %	19 - 40	PASS	
Pole Section-L8	76.7 %	0 - 19	PASS	



**DESIGN CRITERIA:**

1. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

County: Windham  
Wind Load: 85 mph (fastest mile)  
                  105 mph (3 second gust)  
Nominal Ice Thickness: 1/2 inch

2. Approximate height above grade to proposed antennas: 130'

**\*Calculations and referenced documents are attached.**

**ASSUMPTIONS:**

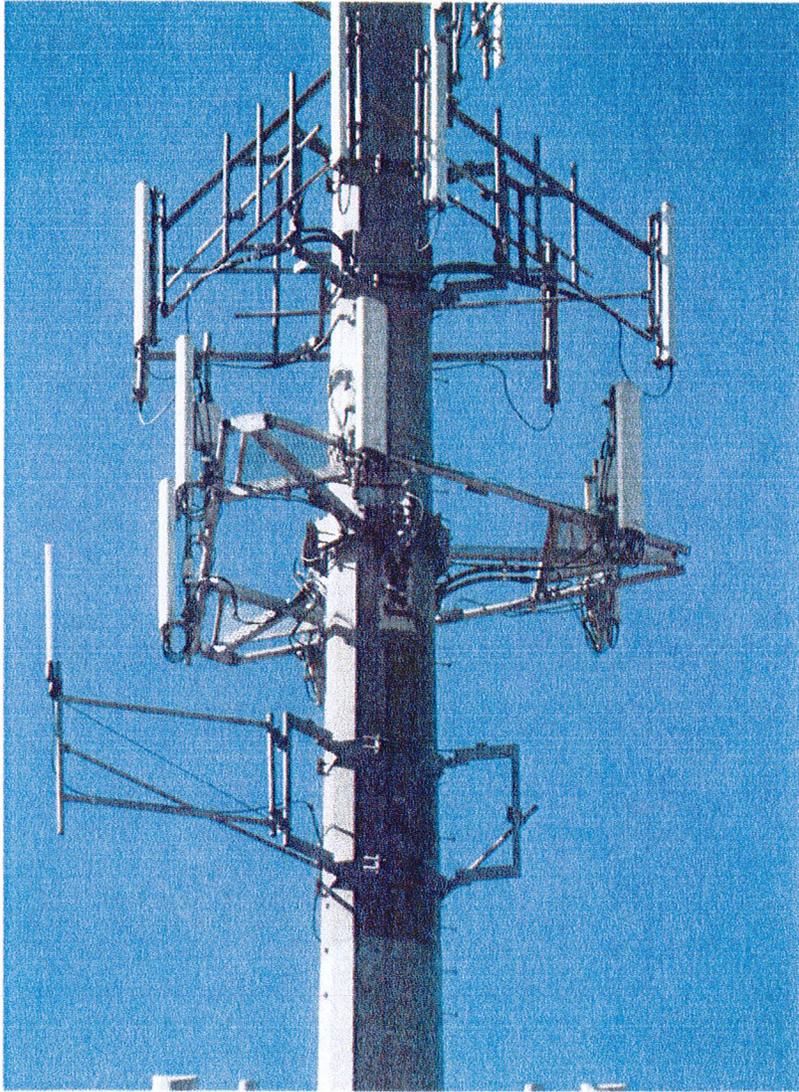
1. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
2. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.
5. The foundation of the tower was not checked due to lack of information. As-built foundation drawings and geotechnical report would be required to determine whether the foundation is capable of supporting the proposed loadings.



**SUPPORT RECOMMENDATIONS:**

HDG recommends that the proposed antennas be mounted on the existing steel platform supported by the monopole; the proposed RRHs and surge arrestor be mounted on the proposed mount pipes.

Reference HDG's Latest Construction Drawings for all component and connection requirements (attached).

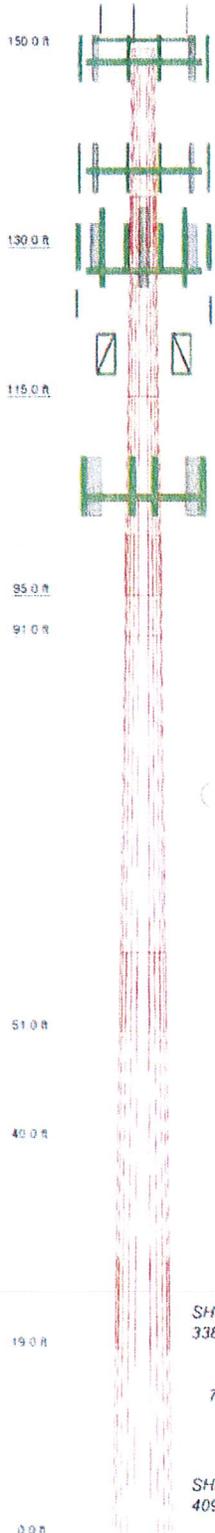


**Photo 1:** Photo illustrating the monopole with Appurtenances shown.



**CALCULATIONS**

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	20.00	12	0.2500	5.00	27.6125	34.3125	1888.1	
2	20.00	12	0.2500	32.1875	38.0875	1927.7		
3	20.00	12	0.3125	6.00	45.1875	2850.5		
4	10.00	12	0.3125	42.6125	45.8125	1503.2		
5	40.00	12	0.3750	8.00	48.8125	5641.3		
6	18.00	12	0.3750	55.4125	61.6875	4545.5		
7	21.00	12	0.4375	9.00	61.6875	6508.7		
8	28.00	12	0.4375	64.7054	73.8125	9237.4		



### DESIGNED APPURTENANCE LOADING

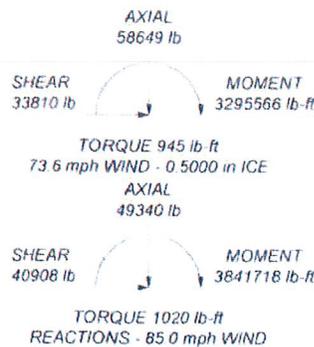
TYPE	ELEVATION	TYPE	ELEVATION
Omni 3'x4'	153	(2) Powerwave LGP21900 (ATT - existing)	130
Omni 3'x4'	153	DAS-HY-DFDM (ATT - existing)	130
Lightning Rod 3/4"x6"	152.5	DAS-HY-DFDM (ATT - existing)	130
10.5' horizontal pipe	150.9	DAS-HY-DFDM (ATT - existing)	130
PIROD 12' T-Frame	149	KMW AM-X-CD-17-65-00T-RET w/mount pipe (ATT - proposed)	130
PIROD 12' T-Frame	149	KMW AM-X-CD-17-65-00T-RET w/mount pipe (ATT - proposed)	130
(2) RV90-17-02DP w/Mount Pipe	149	KMW AM-X-CD-17-65-00T-RET w/mount pipe (ATT - proposed)	130
(2) RV90-17-02DP w/Mount Pipe	149	(2) Gen TMA	149
(2) Gen TMA	149	(2) Gen TMA	149
(2) Gen TMA	149	(2) Ericsson RRU (ATT - proposed)	130
PIROD 12' T-Frame	138	(2) Ericsson RRU (ATT - proposed)	130
PIROD 12' T-Frame	138	Ring Mount (ATT - proposed)	129
PIROD 12' T-Frame	138	Surge Arrestor (DC6-48-50-1A-8F) (ATT - proposed)	128
(2) DB980H90E-M w/Mount Pipe	138	14' Low Profile Platform (ATT - existing)	128
(2) DB980H90E-M w/Mount Pipe	138	Omni 3'x4'	124.3
(2) DB980H90E-M w/Mount Pipe	138	Omni 3'x4'	123.7
(2) Powerwave 7770 w/mount pipe (ATT - existing)	130	Pired 5' Side Mount Standoff (1)	119.3
(2) Powerwave 7770 w/mount pipe (ATT - existing)	130	Pired 6' Side Mount Standoff (1)	119.3
(2) Powerwave 7770 w/mount pipe (ATT - existing)	130	2 Side Mount Standoff	119.3
(2) Powerwave TMA LGP21400 (ATT - existing)	130	(2) LPA 185063/12CF w/mount pipe	106
(2) Powerwave TMA LGP21400 (ATT - existing)	130	(2) LPA 185063/12CF w/mount pipe	106
(2) Powerwave TMA LGP21400 (ATT - existing)	130	(2) LPA 185063/12CF w/mount pipe	106
(2) Powerwave LGP21900 (ATT - existing)	130	(2) LPA 80063-6CF EDIN w/mount pipe	106
(2) Powerwave LGP21900 (ATT - existing)	130	(2) LPA 80063-6CF EDIN w/mount pipe	106
(2) Powerwave LGP21900 (ATT - existing)	130	14 Low Profile Platform	105.2

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-45	45 ksi	60 ksi			

### TOWER DESIGN NOTES

- 1 Tower is located in Windham County, Connecticut
- 2 Tower designed for a 85.0 mph basic wind in accordance with the TIA/EIA-222-F Standard
- 3 Tower is also designed for a 73.6 mph basic wind with 0.50 in ice
- 4 Deflections are based upon a 50.0 mph wind
- 5 TOWER RATING 77%



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Proj	CT 5463 Dayville, CT	Client	AT&T
Code	TIA/EIA-222-F	Drawn by	kw
Path		Date	10/18/12
		App'd	Scale NTS
			Draw No E-1

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	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

### 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 Windham County, Connecticut.

Basic wind speed of 85.0 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56.0 pcf.

A wind speed of 73.6 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 50.0 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.

### Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-130.00	20.00	5.00	12	27.8125	34.3125	0.2500	1.0000	A36M-45 (45 ksi)
L2	130.00-115.00	20.00	0.00	12	32.1875	38.6875	0.2500	1.0000	A36M-45 (45 ksi)
L3	115.00-95.00	20.00	6.00	12	38.6875	45.1875	0.3125	1.2500	A36M-45 (45 ksi)
L4	95.00-91.00	10.00	0.00	12	42.6125	45.8125	0.3125	1.2500	A36M-45 (45 ksi)
L5	91.00-51.00	40.00	8.00	12	45.8125	58.8750	0.3750	1.5000	A36M-45 (45 ksi)
L6	51.00-40.00	19.00	0.00	12	55.5125	61.6875	0.3750	1.5000	A36M-45 (45 ksi)
L7	40.00-19.00	21.00	9.00	12	61.6875	68.5000	0.4375	1.7500	A36M-45 (45 ksi)
L8	19.00-0.00	28.00		12	64.7054	73.8125	0.4375	1.7500	A36M-45 (45 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>3</sup>	w in	w/t
1.1	28.7936	22.1878	2151.4817	9.8674	14.4069	149.3372	4359.4852	10.9202	6.7838	27.135
	35.5229	27.4203	4060.7980	12.1944	17.7739	228.4700	8228.2777	13.4954	8.5258	34.103
1.2	35.0053	25.7097	3347.2225	11.4336	16.6731	200.7556	6782.3803	12.6535	7.9562	31.825
	40.0522	30.9422	5835.0856	13.7606	20.0401	291.1701	11823.4654	15.2288	9.6982	38.793
1.3	40.0522	38.6148	7258.3350	13.7382	20.0401	362.1901	14707.3546	19.0051	9.5307	30.498
	46.7815	45.1555	11606.6056	16.0652	23.4071	495.8578	23518.1297	22.2241	11.2728	36.073

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	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

Section	Tip Dia. in	Area in <sup>2</sup>	<i>l</i> in <sup>4</sup>	<i>r</i> in	<i>C</i> in	<i>I/C</i> in <sup>3</sup>	<i>J</i> in <sup>4</sup>	<i>I/Q</i> in <sup>2</sup>	<i>w</i> in	<i>w/t</i>
L4	46.1034	42.5644	9721.0448	15.1434	22.0733	440.3988	19697.4723	20.9489	10.5826	33.864
	47.4286	45.7844	12098.3469	16.2890	23.7309	509.8146	24514.5309	22.5337	11.4403	36.609
L5	47.4286	54.8658	14458.2714	16.2666	23.7309	609.2599	29296.3778	27.0033	11.2728	30.061
	60.9519	70.6388	30856.0755	20.9430	30.4973	1011.7658	62522.7744	34.7662	14.7735	39.396
L6	60.1625	66.5785	25835.3472	19.7392	28.7555	898.4497	52349.4177	32.7679	13.8724	36.993
	63.8636	74.0348	35523.8611	21.9499	31.9541	1111.7144	71980.9737	36.4377	15.5273	41.406
L7	63.8636	86.2859	41317.8922	21.9275	31.9541	1293.0378	83721.2515	42.4673	15.3598	35.108
	70.9164	95.8830	56694.8448	24.3664	35.4830	1597.8030	114879.126	47.1907	17.1855	39.281
							2			
L8	70.0185	90.5373	47731.0881	23.0079	33.5174	1424.0700	96716.1251	44.5597	16.1685	36.957
	76.4163	103.3670	71033.6649	26.2682	38.2349	1857.8239	143933.463	50.8741	18.6092	42.535
							2			

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		<i>C<sub>v</sub>A<sub>1</sub></i>	Weight
							<i>ft<sup>2</sup>/ft</i>	<i>plf</i>
7/8	A	No	Inside Pole	150.00 - 7.00	2	No Ice	0.00	0.54
						1/2" Ice	0.00	0.54
1 5/8	A	No	Inside Pole	149.00 - 7.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8	A	No	Inside Pole	138.00 - 7.00	6	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1 5/8 (AT&T - existing)	A	No	Inside Pole	130.00 - 7.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
1/2	A	No	Inside Pole	120.00 - 7.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
1 5/8	A	No	Inside Pole	106.00 - 7.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
*****								
FB-1.98B-002 (AT&T - proposed)	C	No	Inside Pole	130.00 - 7.00	1	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
WR-VG122ST-BRDA (AT&T - proposed)	C	No	Inside Pole	130.00 - 7.00	2	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement ft		<i>C<sub>v</sub>A<sub>1</sub></i>	<i>C<sub>v</sub>A<sub>1</sub></i>	Weight
			Horiz	Lateral				Front	Side	lb
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>		
Lightning Rod 3/4"x6'	C	From Leg	0.00	0.00	0.0000	152.50	No Ice	0.45	0.45	30.00
			0.00	0.00			1/2" Ice	1.06	1.06	34.66
10.5' horizontal pipe	C	None			0.0000	150.90	No Ice	2.01	2.01	61.00
							1/2" Ice	2.73	2.73	490.04
Omni 3"x4'	C	From Leg	4.00	0.00	0.0000	153.00	No Ice	0.68	0.68	15.00
			0.00	0.00			1/2" Ice	0.87	0.87	21.82
			0.00							

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	Project	150 ft Monopole	Date	14:34:59 10/18/12
	Client	AT&T	Designed by	kw

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral	Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>1</sub> Front	C <sub>A</sub> A <sub>1</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
Omni 3"x4'	B	From Face	4.00 0.00 0.00	0.0000	153.00	No Ice 0.68 1/2" Ice 0.87	0.68 0.87	15.00 21.82
*****								
PiROD 12' T-Frame	A	From Leg	2.00 0.00 0.00	0.0000	149.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PiROD 12' T-Frame	B	From Leg	2.00 0.00 0.00	0.0000	149.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PiROD 12' T-Frame	C	From Leg	2.00 0.00 0.00	0.0000	149.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
(2) RV90-17-02DP w/Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 4.91 1/2" Ice 5.57	3.64 4.70	43.55 81.64
(2) RV90-17-02DP w/Mount Pipe	B	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 4.91 1/2" Ice 5.57	3.64 4.70	43.55 81.64
(2) RV90-17-02DP w/Mount Pipe	C	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 4.91 1/2" Ice 5.57	3.64 4.70	43.55 81.64
(2) Gen TMA	A	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 0.68 1/2" Ice 0.80	0.45 0.56	13.20 18.38
(2) Gen TMA	B	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 0.68 1/2" Ice 0.80	0.45 0.56	13.20 18.38
(2) Gen TMA	C	From Leg	3.50 0.00 0.00	0.0000	149.00	No Ice 0.68 1/2" Ice 0.80	0.45 0.56	13.20 18.38
*****								
PiROD 12' T-Frame	A	From Leg	2.00 0.00 0.00	0.0000	138.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PiROD 12' T-Frame	B	From Leg	2.00 0.00 0.00	0.0000	138.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
PiROD 12' T-Frame	C	From Leg	2.00 0.00 0.00	0.0000	138.00	No Ice 12.20 1/2" Ice 17.60	12.20 17.60	360.00 490.00
(2) DB980H90E-M w/Mount Pipe	A	From Leg	3.50 0.00 0.00	0.0000	138.00	No Ice 4.27 1/2" Ice 4.86	3.86 4.95	34.05 69.84
(2) DB980H90E-M w/Mount Pipe	B	From Leg	3.50 0.00 0.00	0.0000	138.00	No Ice 4.27 1/2" Ice 4.86	3.86 4.95	34.05 69.84
(2) DB980H90E-M w/Mount Pipe	C	From Leg	3.50 0.00 0.00	0.0000	138.00	No Ice 4.27 1/2" Ice 4.86	3.86 4.95	34.05 69.84
*****								
14' Low Profile Platform (AT&T - existing)	A	None		0.0000	128.00	No Ice 17.30 1/2" Ice 22.10	17.30 22.10	1500.00 2030.00
(2) Powerwave 7770 w/mount pipe (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 6.02 1/2" Ice 6.47	4.10 4.75	57.25 101.14
(2) Powerwave 7770 w/mount	B	From Leg	3.50	0.0000	130.00	No Ice 6.02	4.10	57.25

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	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>FA</sub> Front ft <sup>2</sup>	C <sub>SA</sub> Side ft <sup>2</sup>	Weight lb
pipe (AT&T - existing)			0.00 0.00			1/2" Ice 6.47	4.75	101.14
(2) Powerwave 7770 w/mount pipe (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 6.47	6.02 4.10 4.75	57.25 101.14
(2) Powerwave TMA LGP21400 (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1.38	1.23 0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21400 (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1.38	1.23 0.41 0.52	14.10 21.29
(2) Powerwave TMA LGP21400 (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1.38	1.23 0.41 0.52	14.10 21.29
(2) Powerwave LGP21900 (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.30	0.23 0.12 0.17	5.50 7.70
(2) Powerwave LGP21900 (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.30	0.23 0.12 0.17	5.50 7.70
(2) Powerwave LGP21900 (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.30	0.23 0.12 0.17	5.50 7.70
DAS-HY-DFDM (AT&T - existing)	A	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.18	0.12 0.03 0.06	5.00 6.21
DAS-HY-DFDM (AT&T - existing)	B	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.18	0.12 0.03 0.06	5.00 6.21
DAS-HY-DFDM (AT&T - existing)	C	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 0.18	0.12 0.03 0.06	5.00 6.21
*****								
KMW AM-X-CD-17-65-00T-RET w/mount pipe (AT&T - proposed)	A	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 12.32	11.60 9.39 10.90	111.61 198.07
KMW AM-X-CD-17-65-00T-RET w/mount pipe (AT&T - proposed)	B	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 12.32	11.60 9.39 10.90	111.61 198.07
KMW AM-X-CD-17-65-00T-RET w/mount pipe (AT&T - proposed)	C	From Leg	3.50 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 12.32	11.60 9.39 10.90	111.61 198.07
(2) Ericsson RRU (AT&T - proposed)	A	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 2.26	2.07 1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	B	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 2.26	2.07 1.08 1.23	44.00 58.64
(2) Ericsson RRU (AT&T - proposed)	C	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 2.26	2.07 1.08 1.23	44.00 58.64
Surge Arrestor (DC6-48-60-18-8F) (AT&T - proposed)	A	From Leg	1.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1.46	1.27 1.27 1.46	20.00 35.12

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	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

Description	Face or Leg	Offset Type	Offsets: Hor- Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>1</sub> A <sub>1</sub> Front ft <sup>2</sup>	C <sub>2</sub> A <sub>1</sub> Side ft <sup>2</sup>	Weight lb
Ring Mount (AT&T - proposed)	A	None		0.0000	129.00	No Ice 1.40 1/2" Ice 2.40	1.40 2.40	90.00 130.00
Prod 6' Side Mount Standoff (1)	C	From Leg	3.00 0.00 0.00	0.0000	119.30	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
Omni 3"x4'	C	From Leg	6.50 0.00 0.00	0.0000	124.30	No Ice 0.68 1/2" Ice 0.87	0.68 0.87	15.00 21.82
Prod 6' Side Mount Standoff (1)	B	From Leg	3.00 0.00 0.00	0.0000	119.30	No Ice 4.97 1/2" Ice 6.12	4.97 6.12	70.00 130.00
Omni 3"x4'	B	From Leg	6.50 0.00 0.00	0.0000	123.70	No Ice 0.68 1/2" Ice 0.87	0.68 0.87	15.00 21.82
2' Side Mount Standoff	A	From Leg	1.00 0.00 0.00	0.0000	119.30	No Ice 1.00 1/2" Ice 1.50	1.00 1.50	30.00 50.00
*****								
14' Low Profile Platform	A	None		0.0000	105.20	No Ice 17.30 1/2" Ice 22.10	17.30 22.10	1500.00 2030.00
(2) LPA-185063/12CF w/mount pipe	A	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 5.23 1/2" Ice 5.78	6.17 7.34	39.05 87.27
(2) LPA-185063/12CF w/mount pipe	B	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 5.23 1/2" Ice 5.78	6.17 7.34	39.05 87.27
(2) LPA-185063/12CF w/mount pipe	C	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 5.23 1/2" Ice 5.78	6.17 7.34	39.05 87.27
(2) LPA-80063-6CF-EDIN w/mount pipe	A	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 10.76 1/2" Ice 11.44	10.72 12.00	52.55 143.13
(2) LPA-80063-6CF-EDIN w/mount pipe	B	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 10.76 1/2" Ice 11.44	10.72 12.00	52.55 143.13
(2) LPA-80063-6CF-EDIN w/mount pipe	C	From Leg	2.50 0.00 0.00	0.0000	106.00	No Ice 10.76 1/2" Ice 11.44	10.72 12.00	52.55 143.13

### Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice

<b>inxTower</b>  <b>Hudson Design Group, LLC</b> 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586	<b>Job</b> CT 5463 Dayville, CT	<b>Page</b> 6 of 9
	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

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

### Maximum Reactions

Location	Condition	Gov. Load Comb	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max Vert	24	58649 18	33809 88	0.00
	Max H <sub>x</sub>	11	49340 03	40907 75	-0.00
	Max H <sub>y</sub>	2	49340 03	0 00	40907 75
	Max M <sub>x</sub>	2	3841043 15	0 00	40907 75
	Max M <sub>y</sub>	5	3841350 07	-40907 75	-0.00
	Max Torsion	11	1020 30	40907 75	-0.00
	Min Vert	33	49340 03	0 00	-14154 93
	Min H <sub>x</sub>	5	49340 03	-40907 75	-0.00
	Min H <sub>y</sub>	8	49340 03	0 00	-40907 75
	Min M <sub>x</sub>	8	-3841718 40	0 00	-40907 75
	Min M <sub>y</sub>	11	-3841411 48	40907 75	-0.00
	Min Torsion	5	-1020 30	-40907 75	-0.00

### Tower Mast Reaction Summary

<b>inxTower</b>  <b>Hudson Design Group, LLC</b> 1600 Osgood Street, Building 20 North, Suite 2-101 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 226-5586	Job	CT 5463 Dayville, CT	Page	7 of 9
	Project	150 ft Monopole	Date	14:34:59 10/18/12
	Client	AT&T	Designed by	kw

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>y</sub>	Overtuning Moment, M <sub>x</sub>	Overtuning Moment, M <sub>y</sub>	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	49340.03	0.00	0.00	330.67	30.00	0.00
Dead+Wind 0 deg - No Ice	49340.03	-0.00	-40907.75	-3841043.15	30.71	-22.94
Dead+Wind 30 deg - No Ice	49340.03	20453.87	-35427.15	-3326395.88	-1920659.40	490.29
Dead+Wind 60 deg - No Ice	49340.03	35427.15	-20453.87	-1920353.26	-3326702.35	872.13
Dead+Wind 90 deg - No Ice	49340.03	40907.75	0.00	336.97	-3841350.07	1020.30
Dead+Wind 120 deg - No Ice	49340.03	35427.15	20453.87	1921027.53	-3326702.91	895.08
Dead+Wind 150 deg - No Ice	49340.03	20453.87	35427.15	3327070.80	-1920659.96	530.01
Dead+Wind 180 deg - No Ice	49340.03	-0.00	40907.75	3841718.40	30.71	22.94
Dead+Wind 210 deg - No Ice	49340.03	-20453.87	35427.15	3327070.80	1920721.38	-490.28
Dead+Wind 240 deg - No Ice	49340.03	-35427.15	20453.87	1921027.53	3326764.32	-872.14
Dead+Wind 270 deg - No Ice	49340.03	-40907.75	0.00	336.97	3841411.48	-1020.30
Dead+Wind 300 deg - No Ice	49340.03	-35427.15	-20453.87	-1920353.25	3326763.76	-895.07
Dead+Wind 330 deg - No Ice	49340.03	-20453.87	-35427.15	-3326395.87	1920720.82	-530.02
Dead+Ice+Temp	58649.18	0.00	0.00	573.20	34.63	0.00
Dead+Wind 0 deg+Ice+Temp	58649.18	0.00	-33809.88	-3294386.57	35.73	-39.88
Dead+Wind 30 deg+Ice+Temp	58649.18	16904.94	-29280.22	-2852943.58	-1647452.21	437.77
Dead+Wind 60 deg+Ice+Temp	58649.18	29280.22	-16904.94	-1646898.82	-2853497.28	798.11
Dead+Wind 90 deg+Ice+Temp	58649.18	33809.88	-0.00	589.23	-3294940.71	944.60
Dead+Wind 120 deg+Ice+Temp	58649.18	29280.22	16904.94	1648077.62	-2853497.86	837.99
Dead+Wind 150 deg+Ice+Temp	58649.18	16904.94	29280.22	2854123.04	-1647452.78	506.84
Dead+Wind 180 deg+Ice+Temp	58649.18	0.00	33809.88	3295566.36	35.73	39.88
Dead+Wind 210 deg+Ice+Temp	58649.18	-16904.94	29280.22	2854123.06	1647524.26	-437.76
Dead+Wind 240 deg+Ice+Temp	58649.18	-29280.22	16904.94	1648077.64	2853569.36	-798.11
Dead+Wind 270 deg+Ice+Temp	58649.18	-33809.88	-0.00	589.23	3295012.22	-944.60
Dead+Wind 300 deg+Ice+Temp	58649.18	-29280.22	-16904.94	-1646898.84	2853568.78	-837.99
Dead+Wind 330 deg+Ice+Temp	58649.18	-16904.94	-29280.22	-2852943.60	1647523.68	-506.84
Dead+Wind 0 deg - Service	49340.03	-0.00	-14154.93	-1329048.57	30.73	-7.95
Dead+Wind 30 deg - Service	49340.03	7077.47	-12258.53	-1150944.55	-664662.56	169.85
Dead+Wind 60 deg - Service	49340.03	12258.53	-7077.47	-664355.31	-1151251.84	302.14
Dead+Wind 90 deg - Service	49340.03	14154.93	-0.00	338.00	-1329355.91	353.47
Dead+Wind 120 deg - Service	49340.03	12258.53	7077.47	665031.33	-1151251.90	310.09
Dead+Wind 150 deg - Service	49340.03	7077.47	12258.53	1151620.65	-664662.62	183.62
Dead+Wind 180 deg - Service	49340.03	-0.00	14154.93	1329724.71	30.73	7.95
Dead+Wind 210 deg - Service	49340.03	-7077.47	12258.53	1151620.65	664724.08	-169.85
Dead+Wind 240 deg - Service	49340.03	-12258.53	7077.47	665031.33	1151313.36	-302.14
Dead+Wind 270 deg - Service	49340.03	-14154.93	-0.00	337.99	1329417.37	-353.47
Dead+Wind 300 deg - Service	49340.03	-12258.53	-7077.47	-664355.30	1151313.30	-310.09
Dead+Wind 330 deg - Service	49340.03	-7077.47	-12258.53	-1150944.55	664724.02	-183.62

## Solution Summary

Load Comb	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-49340.03	0.00	0.00	49340.03	0.00	0.000%
2	0.00	-49340.03	-40907.75	0.00	49340.03	40907.75	0.000%
3	20453.87	-49340.03	-35427.15	-20453.87	49340.03	35427.15	0.000%
4	35427.15	-49340.03	-20453.87	-35427.15	49340.03	20453.87	0.000%
5	40907.75	-49340.03	0.00	-40907.75	49340.03	-0.00	0.000%
6	35427.15	-49340.03	20453.87	-35427.15	49340.03	-20453.87	0.000%
7	20453.87	-49340.03	35427.15	-20453.87	49340.03	-35427.15	0.000%
8	0.00	-49340.03	40907.75	0.00	49340.03	-40907.75	0.000%
9	-20453.87	-49340.03	35427.15	20453.87	49340.03	-35427.15	0.000%
10	-35427.15	-49340.03	20453.87	35427.15	49340.03	-20453.87	0.000%
11	-40907.75	-49340.03	0.00	40907.75	49340.03	-0.00	0.000%
12	-35427.15	-49340.03	-20453.87	35427.15	49340.03	20453.87	0.000%
13	-20453.87	-49340.03	-35427.15	20453.87	49340.03	35427.15	0.000%

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	Project	150 ft Monopole	Date	14:34:59 10/18/12
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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
14	0.00	-58649.18	0.00	0.00	58649.18	0.00	0.000%
15	0.00	-58649.18	-33809.88	-0.00	58649.18	33809.88	0.000%
16	16904.94	-58649.18	-29280.22	-16904.94	58649.18	29280.22	0.000%
17	29280.22	-58649.18	-16904.94	-29280.22	58649.18	16904.94	0.000%
18	33809.88	-58649.18	0.00	-33809.88	58649.18	0.00	0.000%
19	29280.22	-58649.18	16904.94	-29280.22	58649.18	-16904.94	0.000%
20	16904.94	-58649.18	29280.22	-16904.94	58649.18	-29280.22	0.000%
21	0.00	-58649.18	33809.88	-0.00	58649.18	-33809.88	0.000%
22	-16904.94	-58649.18	29280.22	16904.94	58649.18	-29280.22	0.000%
23	-29280.22	-58649.18	16904.94	29280.22	58649.18	-16904.94	0.000%
24	-33809.88	-58649.18	0.00	33809.88	58649.18	0.00	0.000%
25	-29280.22	-58649.18	-16904.94	29280.22	58649.18	16904.94	0.000%
26	-16904.94	-58649.18	-29280.22	16904.94	58649.18	29280.22	0.000%
27	0.00	-49340.03	-14154.93	0.00	49340.03	14154.93	0.000%
28	7077.46	-49340.03	-12258.53	-7077.47	49340.03	12258.53	0.000%
29	12258.53	-49340.03	-7077.46	-12258.53	49340.03	7077.47	0.000%
30	14154.93	-49340.03	0.00	-14154.93	49340.03	0.00	0.000%
31	12258.53	-49340.03	7077.46	-12258.53	49340.03	-7077.47	0.000%
32	7077.46	-49340.03	12258.53	-7077.47	49340.03	-12258.53	0.000%
33	0.00	-49340.03	14154.93	0.00	49340.03	-14154.93	0.000%
34	-7077.46	-49340.03	12258.53	7077.47	49340.03	-12258.53	0.000%
35	-12258.53	-49340.03	7077.46	12258.53	49340.03	-7077.47	0.000%
36	-14154.93	-49340.03	0.00	14154.93	49340.03	0.00	0.000%
37	-12258.53	-49340.03	-7077.46	12258.53	49340.03	7077.47	0.000%
38	-7077.46	-49340.03	-12258.53	7077.47	49340.03	12258.53	0.000%

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 130	12.1322	33	0.6935	0.0008
L2	135 - 115	9.9673	33	0.6798	0.0007
L3	115 - 95	7.2341	33	0.6080	0.0006
L4	101 - 91	5.5527	33	0.5359	0.0004
L5	91 - 51	4.4684	33	0.4904	0.0004
L6	59 - 40	1.8329	33	0.2930	0.0001
L7	40 - 19	0.8307	33	0.1951	0.0001
L8	28 - 0	0.4241	33	0.1286	0.0001

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	Omni 3"x4'	33	12.1322	0.6935	0.0008	113923
152.50	Lightning Rod 3/4"x6'	33	12.1322	0.6935	0.0008	113923
150.90	10' horizontal pipe	33	12.1322	0.6935	0.0008	113923
149.00	PIROD 12' T-Frame	33	11.9871	0.6931	0.0008	113923
138.00	PIROD 12' T-Frame	33	10.3969	0.6847	0.0007	47240
130.00	(2) Powerwave 7770 w/mount pipe	33	9.2584	0.6679	0.0007	22390

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	<b>Project</b> 150 ft Monopole	<b>Date</b> 14:34:59 10/18/12
	<b>Client</b> AT&T	<b>Designed by</b> kw

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist "	Radius of Curvature ft
129.00	Ring Mount	33	9.1180	0.6650	0.0007	20688
128.00	14' Low Profile Platform	33	8.9783	0.6619	0.0007	19226
124.30	Omni 3"x4'	33	8.4669	0.6490	0.0007	15241
123.70	Omni 3"x4'	33	8.3849	0.6467	0.0007	14745
119.30	Pirod 6' Side Mount Standoff (1)	33	7.7934	0.6284	0.0007	11906
106.00	(2) LPA-185063/12CF w/mount pipe	33	6.1308	0.5610	0.0005	12502
105.20	14' Low Profile Platform	33	6.0368	0.5568	0.0005	12780

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
L1	150 - 130	Pole	TP34 3125x27 8125x0.25	1	-3922.49	939803.62	11.8	Pass
L2	130 - 115	Pole	TP38 6875x32 1875x0.25	2	-9426.68	1072699.71	40.4	Pass
L3	115 - 95	Pole	TP45 1875x38 6875x0.3125	3	-13764.70	1554571.20	44.9	Pass
L4	95 - 91	Pole	TP45 8125x42.6125x0.3125	4	-16545.20	1632405.06	56.6	Pass
L5	91 - 51	Pole	TP58 875x45 8125x0.375	5	-24642.60	2378058.57	65.0	Pass
L6	51 - 40	Pole	TP61 6875x55 5125x0.375	6	-31943.40	2479259.93	77.0	Pass
L7	40 - 19	Pole	TP68 5x61 6875x0.4375	7	-36156.90	3235364.16	65.5	Pass
L8	19 - 0	Pole	TP73 8125x64 7054x0.4375	8	-49334.50	3408814.11	76.7	Pass
Summary								
Pole (L6)							77.0	Pass
RATING =							77.0	Pass

**PROJECT INFORMATION**

SCOPE OF WORK: TELECOMMUNICATIONS FACILITY UPGRADE (LTE):  
 1. INSTALL (3) NEW LTE ANTENNAS, (6) RRH'S, (1) SURGE ARRESTOR, (1) FIBER LINE, (2) DC POWER LINES & (1) GPS ANTENNA  
 2. INSTALL (1) LTE 6601 CABINET, (1) DC POWER PLANT & (1) SURGE SUPPRESSOR

SITE ADDRESS: 79 PUTNAM PIKE  
 DAYVILLE, CT 06241

LATITUDE: 41.84689 N 41° 50' 48.8" N  
 LONGITUDE: 71.87930 W 71° 52' 45.5" W

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



**SITE NUMBER: CT5463**  
**SITE NAME: KILLINGLY NORTH**

**DRAWING INDEX**

**REV**

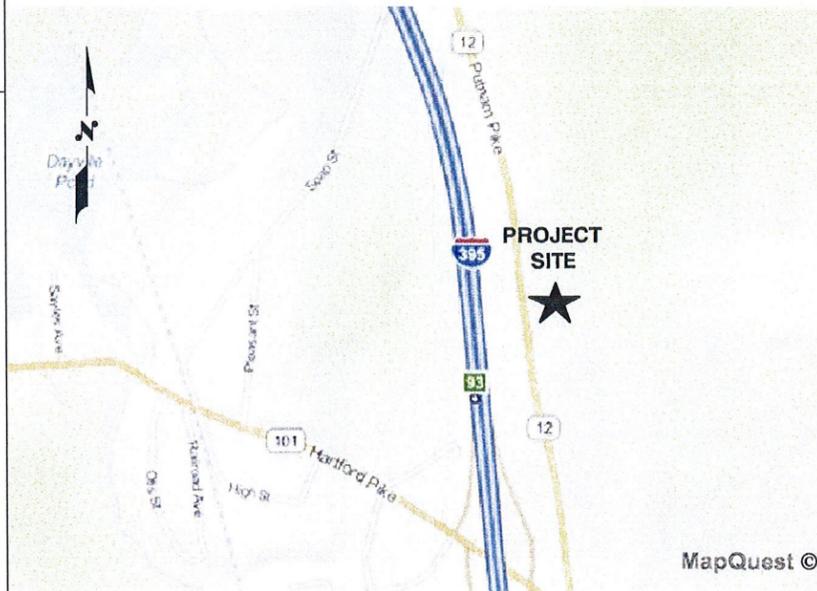
**VICINITY MAP**

**GENERAL NOTES**

- T-1 TITLE SHEET
- GN-1 GENERAL NOTES
- A-1 COMPOUND AND EQUIPMENT PLAN
- A-2 ELEVATION AND ANTENNA PLAN
- A-3 DETAILS
- A-4 DETAILS
- G-1 PLUMBING DIAGRAM & GROUNDING DETAILS

- 0
- 0
- 0
- 0
- 0
- 0
- 0

DIRECTIONS TO SITE:  
 START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD 4.5 MILES. MERGE ONTO CT-3 N VIA EXIT 25 TOWARD GLASTONBURY. MERGE ONTO CT-2 E TOWARD NORWICH 32.8 MILES. MERGE ONTO I-395 N VIA 28N TOWARD PROVIDENCE 27.5 MILES. TAKE THE CT-101 EXIT, EXIT 93, TOWARD DAYVILLE/E. KILLINGLY. TURN RIGHT ONTO CT-101/HARTFORD PIKE. TURN SHARP LEFT ONTO PUTNAM PIKE/CT-12. 79 PUTNAM PIKE IS ON THE LEFT.



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2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL  
 BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455 OR DIAL 811

**UNDERGROUND SERVICE ALERT**

1400 OSGOOD STREET  
 BUILDING 20 NORTH, SUITE 2-101  
 N. ANDOVER, MA 01845  
 TEL: (978) 557-5553  
 FAX: (978) 336-5586

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

**SITE NUMBER: CT5463**  
**SITE NAME: KILLINGLY NORTH**  
 79 PUTNAM PIKE  
 DAYVILLE, CT 06241  
 WINDHAM COUNTY

500 ENTERPRISE DRIVE, SUITE 3A  
 ROCKY HILL, CT 06067

0	08/08/12	ISSUED FOR REVIEW	RM	DC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: DC	DRAWN BY: RM		

AT&T		
TITLE SHEET (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	T-1	0

**GROUNDING NOTES**

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50

**GENERAL NOTES**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
 CONTRACTOR - NEXLINK  
 SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER - AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

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

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:  
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.  
 BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS  
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS  
 LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

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

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

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**ABBREVIATIONS**

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



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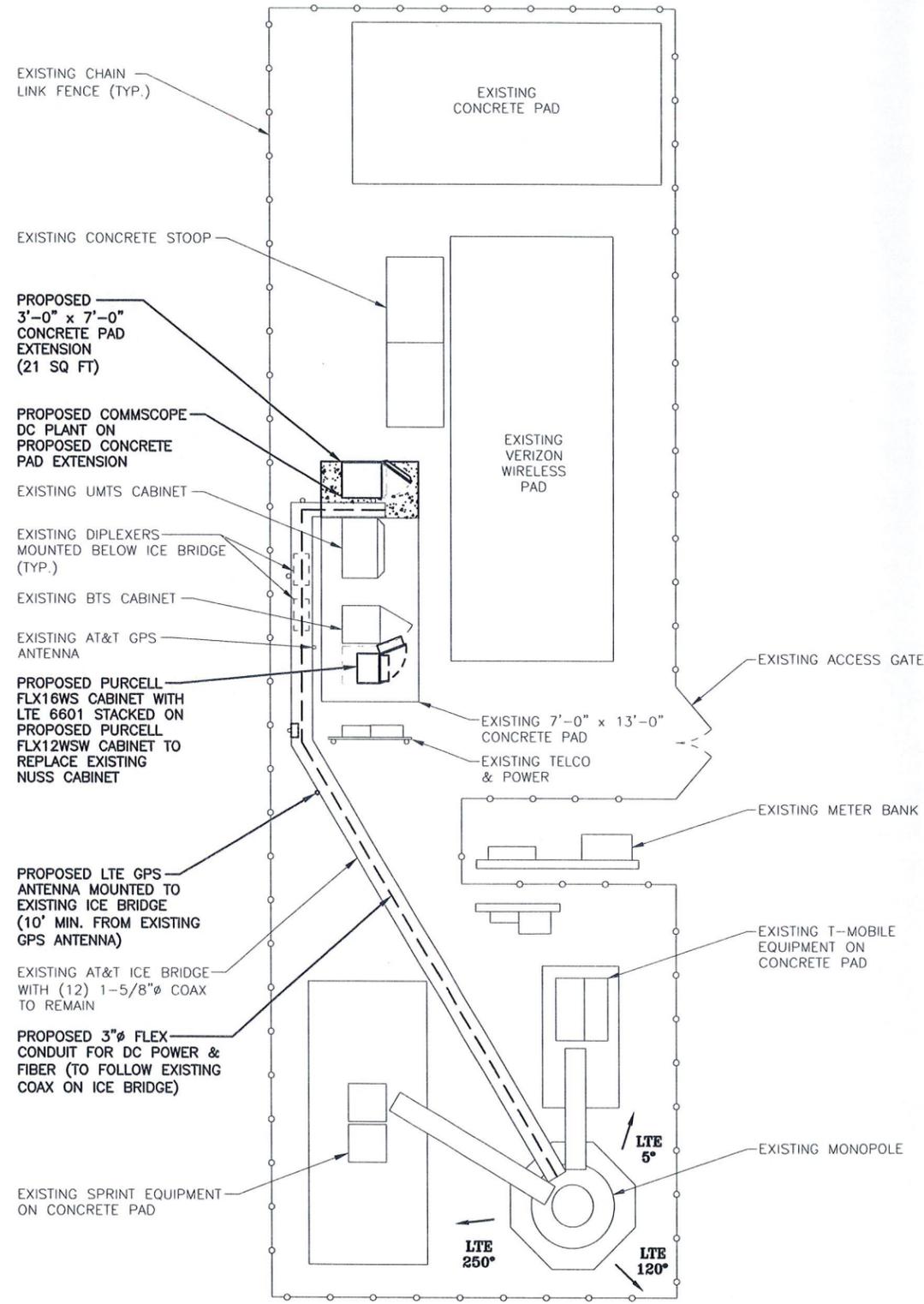
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**SITE NAME: KILLING NORTH**  
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 DAYVILLE, CT 06241  
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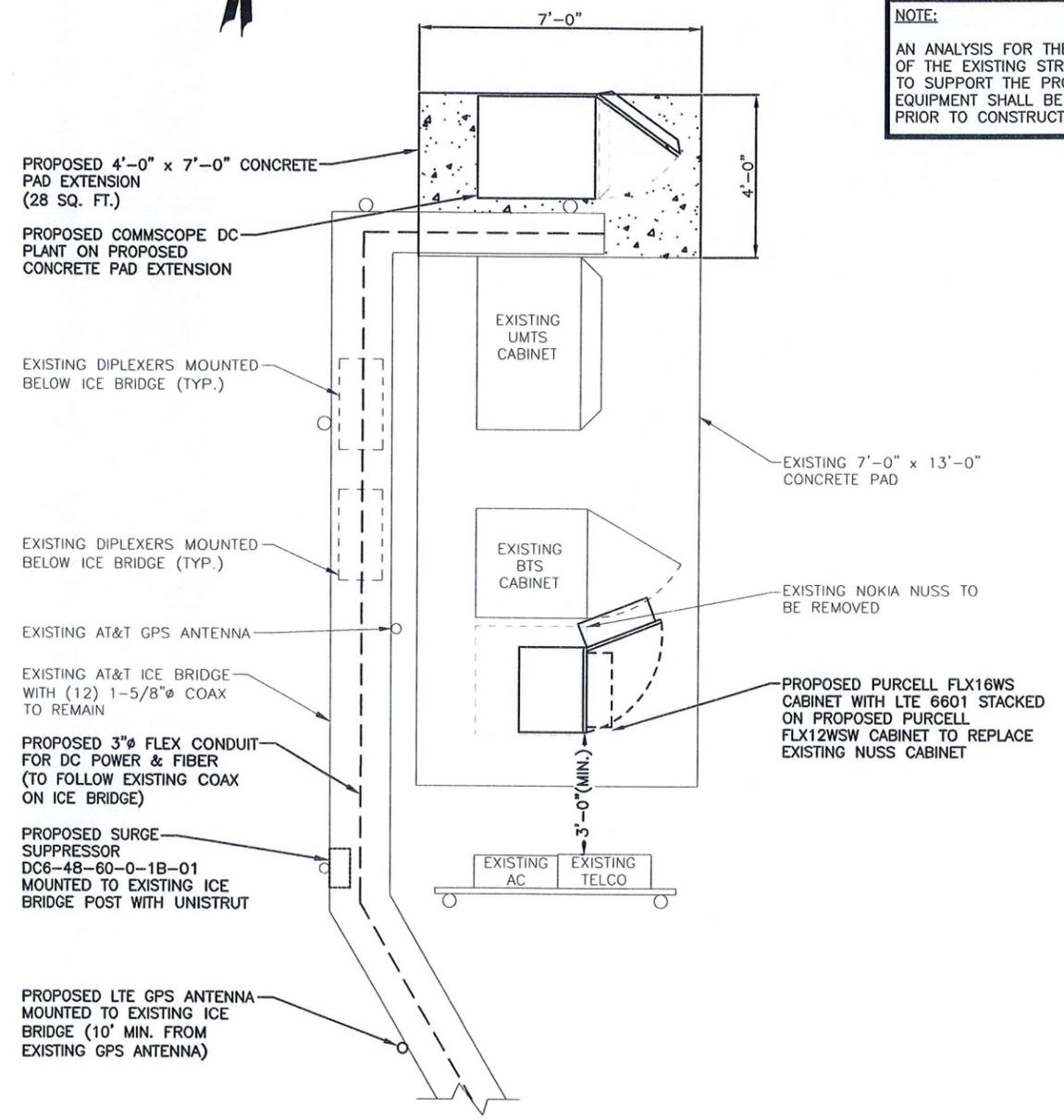
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AT&T		
GENERAL NOTES (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	GN-1	0



**COMPOUND PLAN**  
SCALE: 3/16" = 1'-0"



**EQUIPMENT PLAN**  
SCALE: 1/2" = 1'-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.

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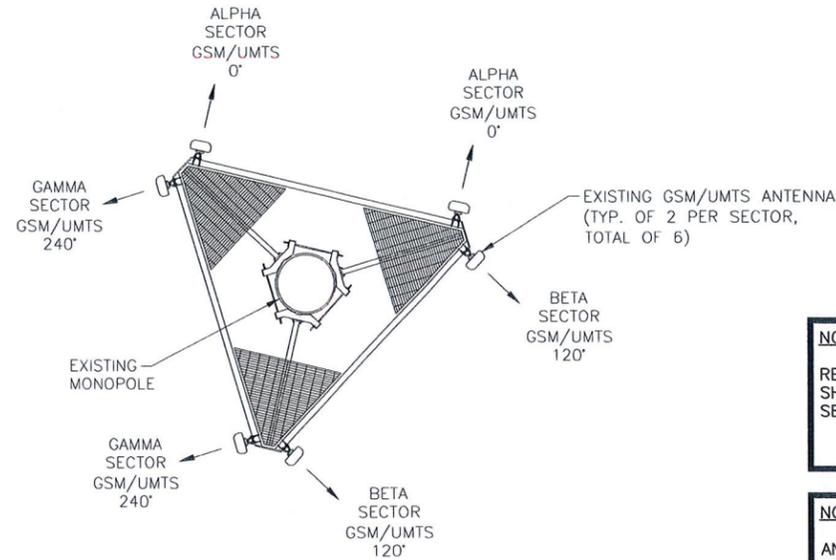
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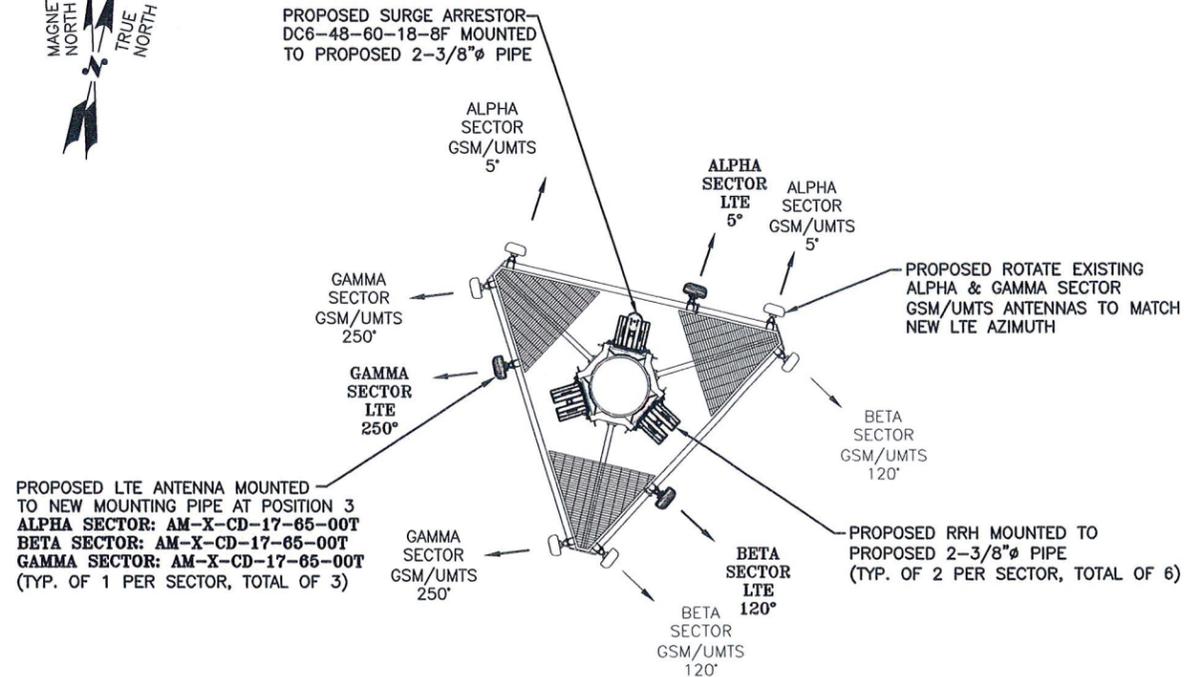
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COMPOUND AND EQUIPMENT PLAN (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	A-1	0



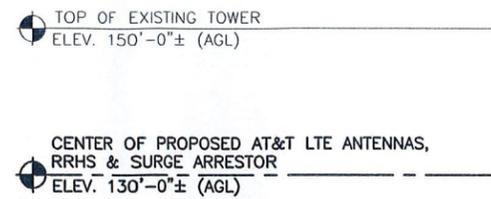
**EXISTING GSM/UMTS ANTENNA PLAN**  
SCALE: N.T.S.

**NOTE:**  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

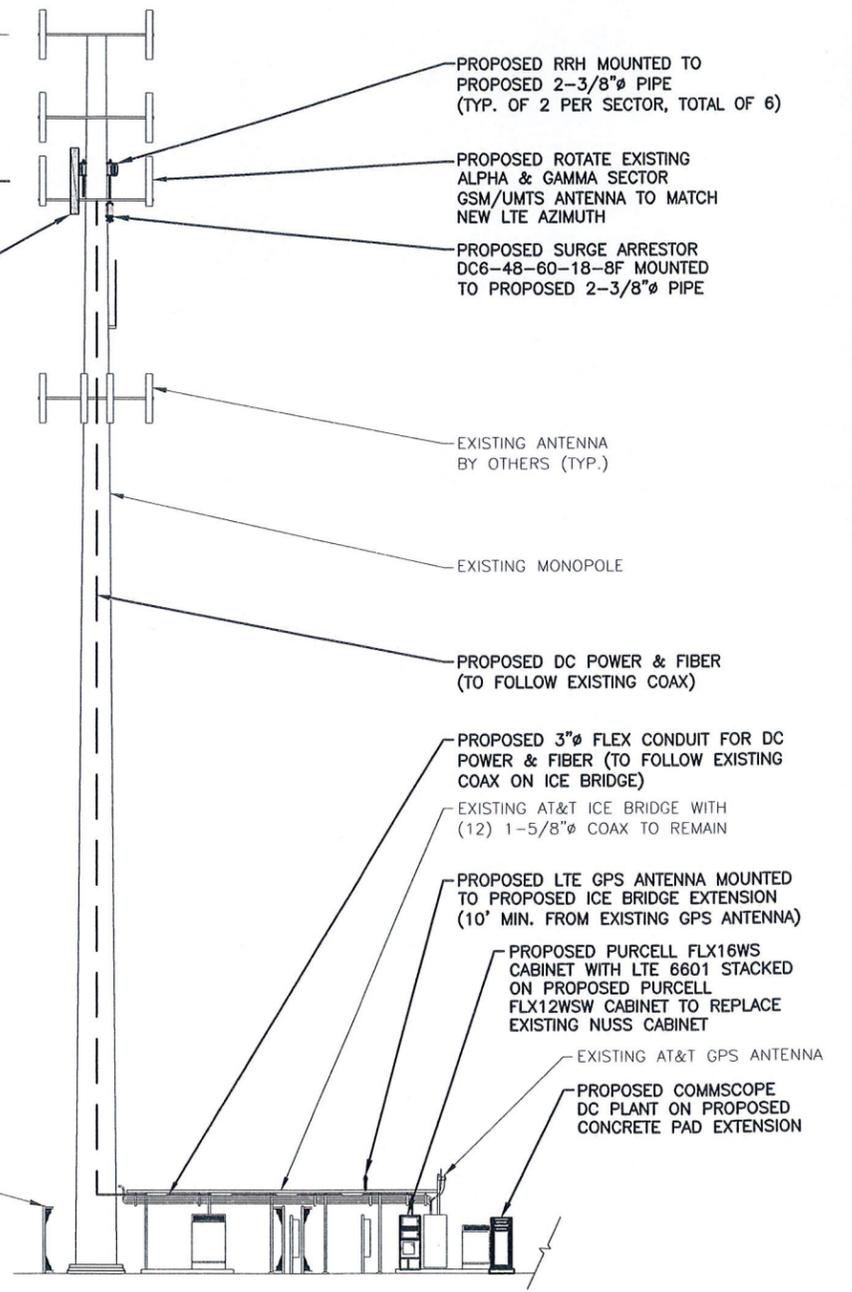
**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



**PROPOSED LTE ANTENNA PLAN**  
SCALE: N.T.S.



PROPOSED LTE ANTENNA MOUNTED TO NEW MOUNTING PIPE AT POSITION 3  
**ALPHA SECTOR: AM-X-CD-17-65-00T**  
**BETA SECTOR: AM-X-CD-17-65-00T**  
**GAMMA SECTOR: AM-X-CD-17-65-00T**  
 (TYP. OF 1 PER SECTOR, TOTAL OF 3)



**EAST ELEVATION**  
SCALE: 3/32"=1'-0"



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ELEVATION & ANTENNA PLAN (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	A-2	0

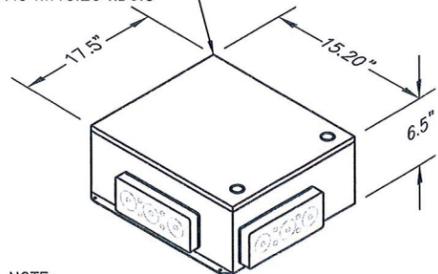
**NOTE:**

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.

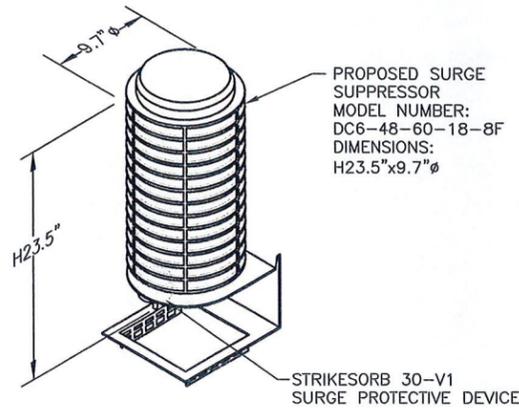
PROPOSED SURGE SUPPRESSOR  
MODEL NUMBER:  
DC6-48-60-0-1B-01  
DIMENSIONS:  
H17.5"xW15.20"xD6.5"



NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**SURGE SUPPRESSOR DETAIL**

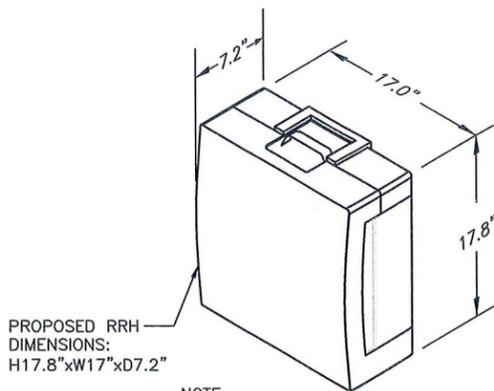
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NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**DC SURGE SUPPRESSOR DETAIL**

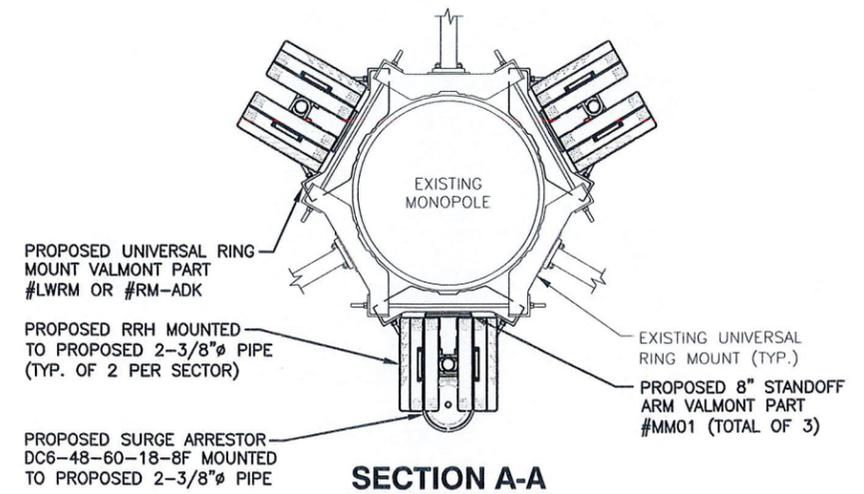
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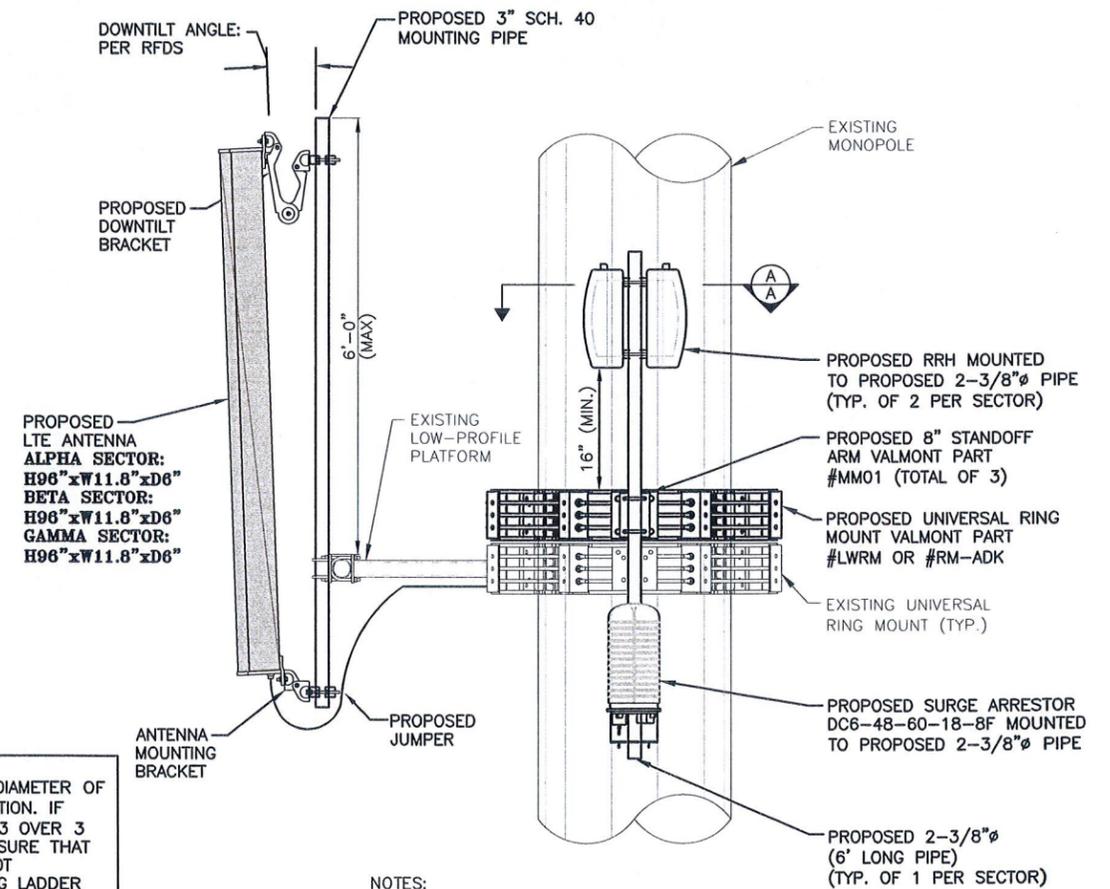
NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**RRH DETAIL**

SCALE: N.T.S.



**SECTION A-A**



NOTES:  
1. REFER TO RFDS & SECTOR SCHEMATICS FOR ANTENNA MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

**PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL**

SCALE: N.T.S.

NOTE:  
1. MINIMUM MONOPOLE DIAMETER OF 2'-0" AT BANDING LOCATION. IF SMALLER, STACK RRH'S 3 OVER 3  
2. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER

PART #	VMI PART #	SIZE RANGE
LWRM	801068	12"-45"
RM-ADK	157286	36"-60" ADAPTER KIT

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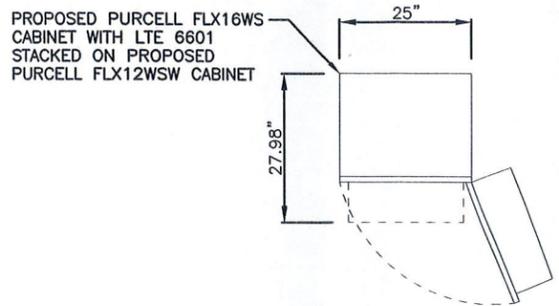
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SCALE: AS SHOWN    DESIGNED BY: DC    DRAWN BY: RM

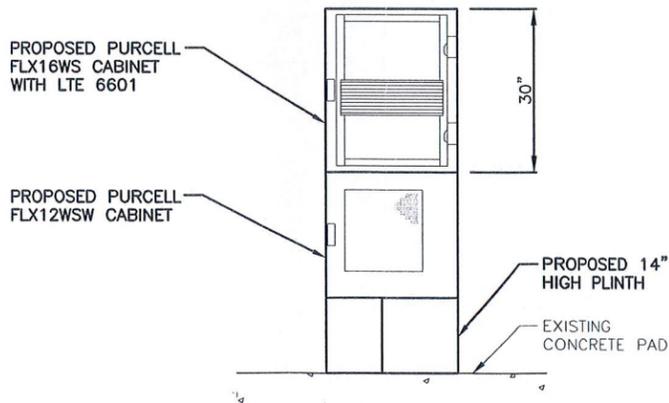
AT&T		
DETAILS (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	A-3	0

**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.

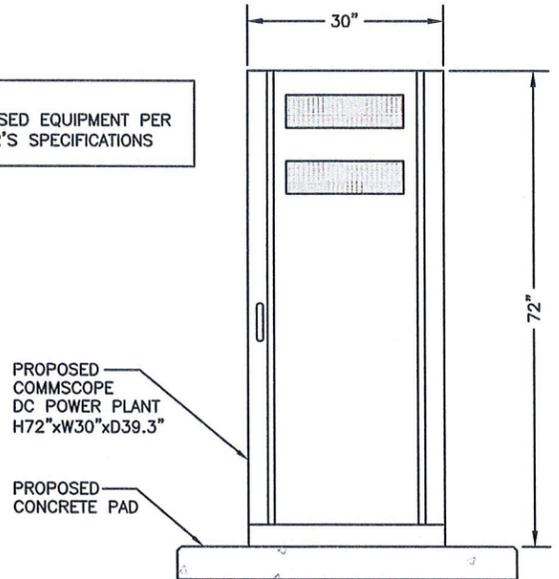


**NOTE:**  
1. MOUNT PROPOSED EQUIPMENT PER MANUFACTURER'S SPECIFICATIONS  
2. CONTRACTOR TO PROVIDE MOUNTING HARDWARE.



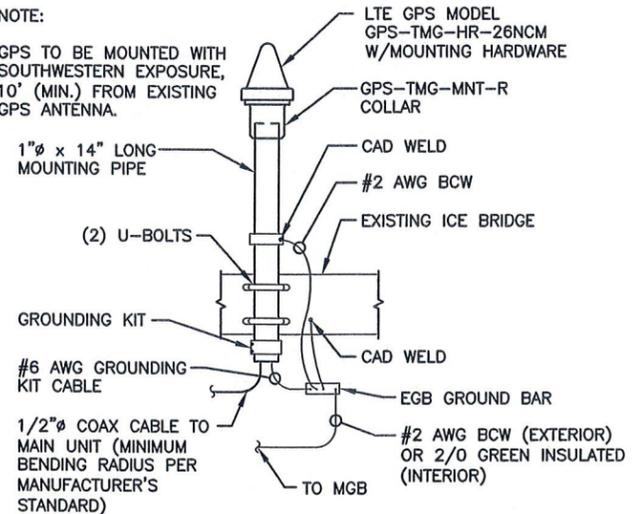
**PROPOSED EQUIPMENT MOUNTING DETAIL**  
SCALE: N.T.S.

**NOTE:**  
MOUNT PROPOSED EQUIPMENT PER MANUFACTURER'S SPECIFICATIONS



**PROPOSED DC POWER PLANT DETAIL**  
SCALE: N.T.S.

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



**GPS MOUNTING DETAIL**  
SCALE: N.T.S.

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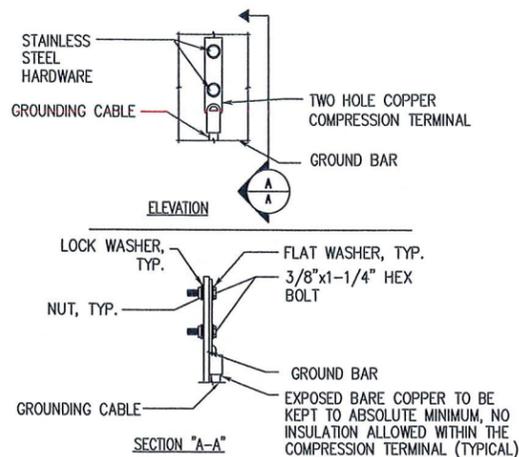
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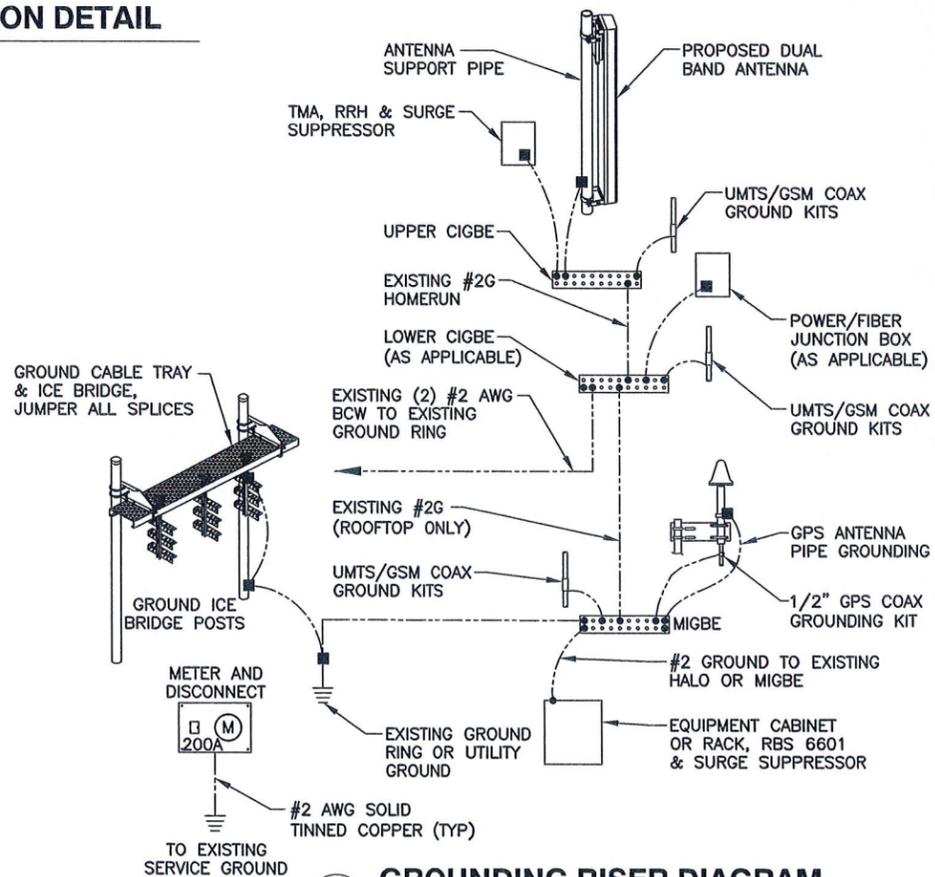
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DETAILS (LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	A-4	0



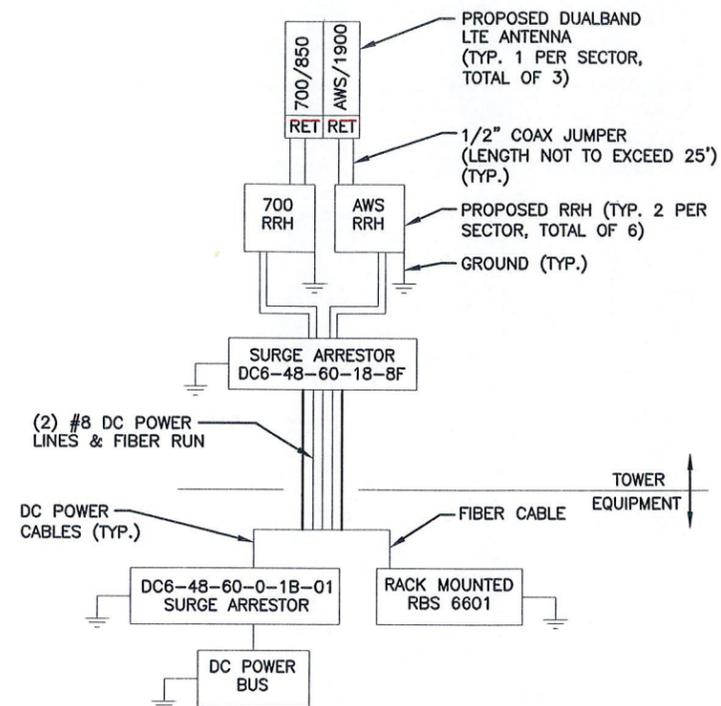
NOTE:  
 1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.  
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.  
 3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

**TYPICAL GROUND BAR CONNECTION DETAIL**

1  
 N.T.S.



3  
 N.T.S. **GROUNDING RISER DIAGRAM**



NOTE:  
 CONTRACTOR TO CONFIRM ALL PARTS & INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

2  
 N.T.S. **LTE PLUMBING DIAGRAM**

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

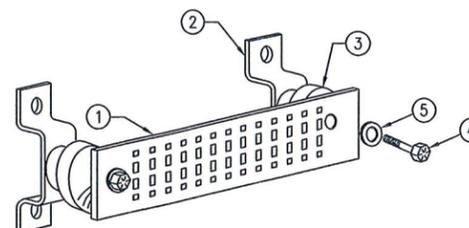
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

**SECTION "P" - SURGE PRODUCERS**

- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- 48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES.

**SECTION "A" - SURGE ABSORBERS**

- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)



4  
 N.T.S. **GROUND BAR DETAIL**

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AT&T		
PLUMBING DIAGRAM & GROUNDING DETAILS		
(LTE)		
JOB NUMBER	DRAWING NUMBER	REV
5463.01	G-1	0