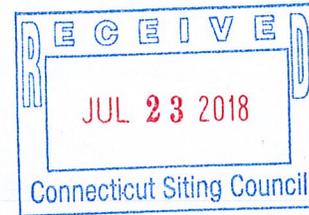




June 5<sup>th</sup>, 2018

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



Regarding: Notice of Exempt Modification – Antenna Modification  
Property Address: 221-223 Brainard Rd., Hartford, CT 06114-2102  
AT&T Site: CT5126

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 100-foot monopole at the above-referenced address, latitude 41.732997°, longitude -72.662047°. Said monopole is owned by Crown Castle and the underlying property owner is the Metropolitan District.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas, swapping (3) antennas, adding (12) twelve remote-radio heads (“RRHs”). The centerline height of the existing antennas is and will remain at 103 feet.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to the Honorable Luke Bronin, Mayor of the City of Hartford, Caitlin Palmer, as Chief of Zoning Administration with the City of Hartford, , as property owner and the tower owner, Crown Castle.

The planned modifications to AT&T’s facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas and accessory equipment along with equipment to be swapped will be installed at the existing height of 103 feet on the 100-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment, and therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support AT&T's proposed modifications (please see enclosed structural analysis completed by B&T Group, dated February 27<sup>th</sup>, 2018).

For the foregoing reasons, AT&T respectfully requests that the proposed remote-radio head installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

*Robert C. Wilson*

Robert C. Wilson  
Site Acquisition Manager

Enclosures: Exhibit 1 – Field Card and GIS Map  
Exhibit 2 – Construction Drawings  
Exhibit 3 – Structural Analysis  
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc: Honorable Luke Bronin, Mayor of the City of Hartford; Caitlin Palmer, as Chief of Zoning Administration with the City of Hartford; The Metropolitan District as Property Owner; Crown Castle, As Tower Owner

SO that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**Hartford, Planning & Zoning  
 Caitlin Palmer**  
 250 Constitution Plaza, 4th Floor  
 Hartford, CT 06103

2. Article Number (Transfer from service label)  
 7017 0190 0000 9032 0416

3. Service Type  
 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail® Restricted Delivery  
 Collect on Delivery  
 Collect on Delivery Restricted Delivery  
 Priority Mail Express®  
 Registered Mail™  
 Registered Mail Restricted Delivery  
 Return Receipt for Merchandise  
 Signature Confirmation™  
 Signature Confirmation Restricted Delivery

Domestic Return Receipt

**SENDER: COMPLETE THIS SECTION**

■ Complete items 1, 2, and 3.  
 ■ Print your name and address on the reverse so that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**Hartford City Hall  
 Office of the Mayor**  
 550 Main Street, Room 200  
 Hartford, CT 06103

2. Article Number (Transfer from service label)  
 7017 0190 0000 9032 0409

3. Service Type  
 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail Restricted Delivery  
 Collect on Delivery  
 Collect on Delivery Restricted Delivery  
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 Insured Mail Restricted Delivery  
 Priority Mail Express®  
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 Signature Confirmation Restricted Delivery

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  
 X *C. Law*  Agent  Address

B. Received by (Printed Name)  
 C. Law

C. Date of Delivery

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

PS Form 3811, July 2015 PSN 7530-02-000-9053

SO that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**Hartford, Planning & Zoning  
 Caitlin Palmer**  
 250 Constitution Plaza, 4th Floor  
 Hartford, CT 06103

2. Article Number (Transfer from service label)  
 7017 0190 0000 9032 0393

3. Service Type  
 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail Restricted Delivery  
 Collect on Delivery  
 Collect on Delivery Restricted Delivery  
 Priority Mail Express®  
 Registered Mail™  
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 ■ Print your name and address on the reverse so that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**Crown Castle  
 Paul Pedicone, Project Manager**  
 3 Corporate Drive, Suite 101  
 Clifton Park, NY 12065

2. Article Number (Transfer from service label)  
 7017 0190 0000 9032 0393

3. Service Type  
 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail Restricted Delivery  
 Collect on Delivery  
 Collect on Delivery Restricted Delivery  
 Insured Mail  
 Insured Mail Restricted Delivery  
 Priority Mail Express®  
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 Signature Confirmation Restricted Delivery

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  
 X *Lindsay Bianca*  Agent  Address

B. Received by (Printed Name)  
 Lindsay Bianca

C. Date of Delivery  
 6/11/15

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

PS Form 3811, July 2015 PSN 7530-02-000-9053

SO that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**The Metropolitan District**  
 555 Main Street  
 Hartford, CT 06103

2. Article Number (Transfer from service label)  
 7017 0190 0000 9032 0423

3. Service Type  
 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail Restricted Delivery  
 Collect on Delivery  
 Collect on Delivery Restricted Delivery  
 Priority Mail Express®  
 Registered Mail™  
 Registered Mail Restricted Delivery  
 Return Receipt for Merchandise  
 Signature Confirmation™  
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Domestic Return Receipt

**SENDER: COMPLETE THIS SECTION**

■ Complete items 1, 2, and 3.  
 ■ Print your name and address on the reverse so that we can return the card to you.  
 ■ Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

**The Metropolitan District**  
 555 Main Street  
 Hartford, CT 06103

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 Adult Signature  
 Adult Signature Restricted Delivery  
 Certified Mail®  
 Certified Mail Restricted Delivery  
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 Collect on Delivery Restricted Delivery  
 Priority Mail Express®  
 Registered Mail™  
 Registered Mail Restricted Delivery  
 Return Receipt for Merchandise  
 Signature Confirmation™  
 Signature Confirmation Restricted Delivery

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  
 X *Marcos Shevach*  Agent  Address

B. Received by (Printed Name)  
 Marcos Shevach

C. Date of Delivery  
 JUN 2015

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

PS Form 3811, July 2015 PSN 7530-02-000-9053

## Unofficial Property Record Card - City of Hartford, CT

### General Property Data

Parcel ID <b>317-817-002</b>	Account Number
Prior Parcel ID	Property Location <b>221 BRAINARD RD HARTFORD</b>
Property Owner <b>THE METROPOLITAN DISTRICT</b>	Property Use <b>SPECIAL ACTS</b>
Mailing Address <b>555 MAIN ST</b>	Most Recent Sale Date <b>12/16/2010</b>
City <b>HARTFORD</b>	Legal Reference <b>06402-0246</b>
Mailing State <b>CT</b> Zip <b>06103-2915</b>	Grantor <b>221-223 BRAINARD ROAD LLC</b>
ParcelZoning ID-1	Sale Price <b>4,705,000</b>
	Land Area <b>121,500.000 square feet</b>

### Current Property Assessment

Card 1 Value	Building Value <b>1,543,500</b>	Xtra Features Value <b>66,640</b>	Land Value <b>518,840</b>	Total Value <b>2,128,980</b>
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### Building Description

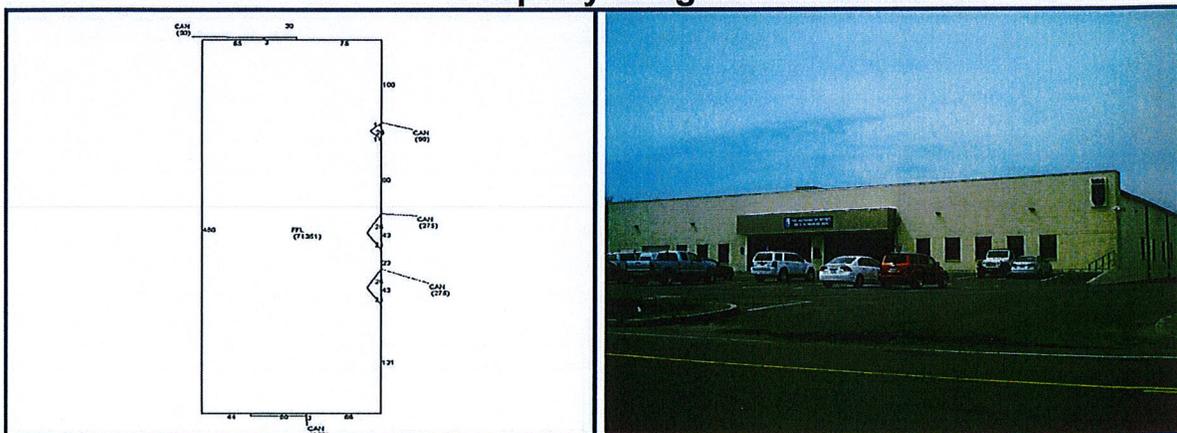
Building Style <b>WAREHSE</b>	Foundation Type <b>Concrete</b>	Flooring Type <b>COMBINATION</b>
# of Living Units <b>0</b>	Frame Type <b>Steel</b>	Basement Floor <b>N/A</b>
Year Built <b>1975</b>	Roof Structure <b>FLAT</b>	Heating Type <b>Warm Air</b>
Building Grade <b>Average</b>	Roof Cover <b>Membrane</b>	Heating Fuel <b>Gas</b>
Building Condition <b>N/A</b>	Siding <b>Conc Block</b>	Air Conditioning <b>32%</b>
Finished Area (SF) <b>71351</b>	Interior Walls <b>DRYWALL</b>	# of Bsmt Garages <b>0</b>
Number Rooms <b>0</b>	# of Bedrooms <b>0</b>	# of Full Baths <b>0</b>
# of 3/4 Baths <b>0</b>	# of 1/2 Baths <b>0</b>	# of Other Fixtures <b>0</b>

### Legal Description

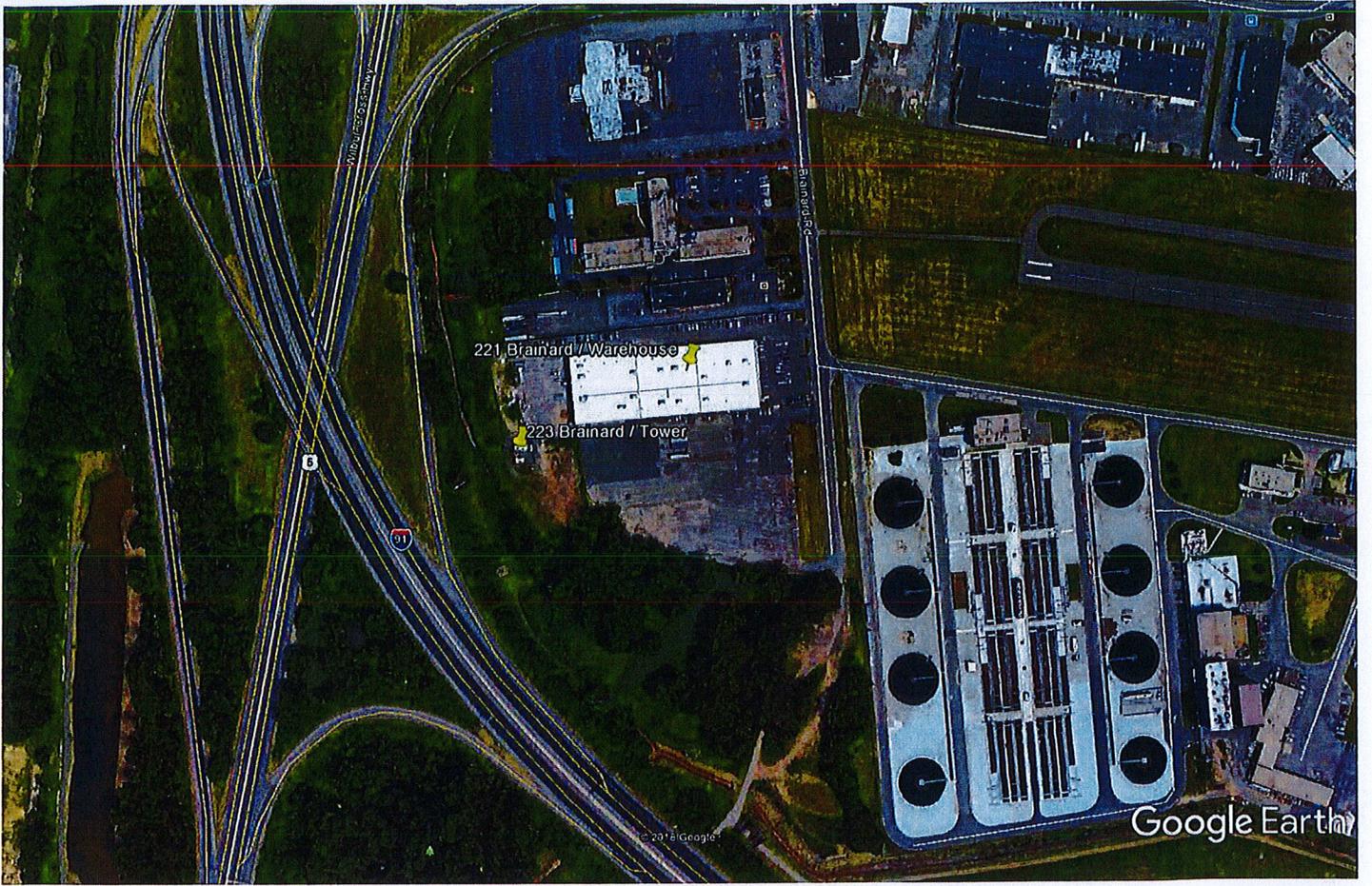
### Narrative Description of Property

This property contains 121,500.000 square feet of land mainly classified as SPECIAL ACTS with a(n) WAREHSE style building, built about 1975 , having Conc Block exterior and Membrane roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

### Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.



Google Earth



Date: February 27, 2018

Charles McGuirt  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277



Black & Veatch Corp.  
6800 W. 115th St., Suite 2292  
Overland Park, KS 66211  
(913) 458-8145

**Subject:** Structural Analysis Report

**Carrier Designation:** AT&T Mobility Co-Locate  
**Carrier Site Number:** CT5126  
**Carrier Site Name:** 10071011

**Crown Castle Designation:** Crown Castle BU Number: 842861  
Crown Castle Site Name: EAST HARTFORD  
HOCHANUM  
Crown Castle JDE Job Number: 480520  
Crown Castle Work Order Number: 1524534  
Crown Castle Application Number: 422653 Rev. 4

**Engineering Firm Designation:** Black & Veatch Corp. Project Number: 194393

**Site Data:** 223 Brainard Road, Hartford, Hartford County, CT  
Latitude 41° 43' 59", Longitude -72° 39' 43.1"  
96.83 Foot - Monopole Tower

Dear Charles McGuirt,

Black & Veatch Corp. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1145674, in accordance with application 422653, revision 4.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor,  $K_{zt}$ , of 1.0 and Risk Category II were used in this analysis. Seismic forces have been evaluated based on Site Class D with spectral response factors  $S_s$  of 0.181g and  $S_1$  of 0.064g.

We at Black & Veatch Corp. appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Patdanai Chongcharoenkamon / Mahesh K. Jadhav

Respectfully submitted by:

Ping Jiang, P.E.

Professional Engineer



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### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This is 96.83 ft Monopole tower mapped by Tower Engineering Professionals in January of 2016. The original design standard and wind speed are unknown.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet. Seismic forces have been evaluated based on Site Class D with spectral response factors  $S_s$  of 0.181g and  $S_1$  of 0.064g.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	101.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 4 1	3/8 3/4 Conduit	1,2
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B66			
		3	ericsson	RRUS 4478 B14			
		6	kaelus	DBC0061F1V51-2			
		3	kathrein	80010965 w/ Mount Pipe			
		6	powerwave technologies	7020.00			
		1	raycap	DC6-48-60-0-8F			
1	raycap	DC6-48-60-18-8F					

Notes:

- 1) See Appendix B for proposed coax configuration
- 2) (4) 3/4" Coax are Routed in Proposed Conduit and (1) 3/8" Coax is Routed in Existing Conduit

**Table 2 - Existing Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	101.0	3	ericsson	RBS 6601	2	1/2	2,4
		6	ericsson	RRUS 12 B4/RRUS A2			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	3 5 2 12 1	3/8 1/2 3/4 1-1/4 Conduit	1,3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		12	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	100.0	1	cci tower mounts	Platform Mount [LP 1201-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
93.0	93.0	1	cci tower mounts	Side Arm Mount [SO 102-3]	-	-	1
		1	raycap	DC6-48-60-18-8F			
86.0	88.0	3	alcatel lucent	RRH2X40-AWS	1 18	1-1/4 1-5/8	1
		5	antel	BXA-171063-12BF w/ Mount Pipe			
		1	antel	BXA-171063-8BF-2 w/ Mount Pipe			
		2	antel	BXA-70063/4CF w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	swedcom	SCCP 2x6015 w/ Mount Pipe			
		2	swedcom	SLCP 2x6015 w/ Mount Pipe			
	86.0	1	cci tower mounts	Platform Mount [LP 303-1]			
79.0	80.0	1	andrew	VHLP2-23	6 2 2	5/16 1/2 Conduit	1,5
		3	argus technologies	LLPX310R w/ Mount Pipe			
		1	dragonwave	HORIZON DUO			
		1	ericsson	RRU22 20 W			
		3	samsung telecommunications	FDD_R6_RRH			
	79.0	1	cci tower mounts	Side Arm Mount [SO 101-3]			

Notes:

- 1) Existing Equipment
- 2) Existing Equipment To Be Removed; Not Considered in This Analysis
- 3) (2) 3/8" Coax are Routed in Conduit
- 4) (1) 1/2" Coax is Removed from Conduit
- 5) (6) 5/16" and (1) 1/2" Coax are Routed in Conduits

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

**3) ANALYSIS PROCEDURE**

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Tower Engineering Professionals, Inc.	6049468	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Tower Engineering Professionals, Inc. (Mapped)	6049752	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Tower Engineering Professionals, Inc. (Mapped)	6071711	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Black & Veatch Corp.	6053122	CCISITES

### 3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing/proposed appurtenance loading, tower/foundation details, and geotechnical data. The existing/proposed loading on the structure is based on CAD level drawings and carrier applications provided by the owner. If any of this information is not current and correct, this report should be considered obsolete and further analysis will be required.

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

### 4.1) Wind Results

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	96.83 - 76.5	Pole	TP28.875x25.75x0.1875	1	-8.60	1087.51	37.4	Pass
L2	76.5 - 39.92	Pole	TP33.375x27.9236x0.2188	2	-14.25	1474.68	88.7	Pass
L3	39.92 - 0	Pole	TP39x32.363x0.2813	3	-22.61	2325.77	96.2	Pass
							Summary	
						Pole (L3)	96.2	Pass
						Rating =	96.2	Pass

**Table 6 - Tower Component Stresses vs. Capacity – LC5**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	93.9	Pass
1	Base Plate	0	61.8	Pass
1	Base Foundation	0	42.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>96.2%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

### 4.2) Seismic Result

Tower and foundation have been analyzed based on the seismic criteria outlined in section 2 of this report. Based on the analysis, seismic loading is not governing the tower and foundation stress. Wind loading is governing the tower and foundation stress.

#### **4.3) Recommendations**

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.



# Radio Frequency Emissions Analysis Report

AT&T Existing Facility

**Site ID: CT5126**

FA#: 10071011

USID: 4539

East Hartford Hochanum  
223 Brainerd Road  
Hartford, CT 06114

**April 19, 2018**

**Centerline Communications Project Number: 950006-115**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>38.60 %</b>



April 19, 2018

AT&T Mobility – New England  
Attn: John Benedetto, RF Manager  
550 Cochituate Road  
Suite 550 – 13&14  
Framingham, MA 06040

### Emissions Analysis for Site: **CT5126 – East Hartford Hochanum**

Centerline Communications, LLC (“Centerline”) was directed to analyze the proposed AT&T facility located at **223 Brainerd Road, Hartford, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 700 and 850 MHz Bands are approximately  $467 \mu\text{W}/\text{cm}^2$  and  $567 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is  $1000 \mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



## CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **223 Brainerd Road, Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	40
LTE	1900 MHz (PCS)	4	40
LTE	700 MHz (Band 14)	4	40
LTE	2100 MHz (AWS)	4	30
LTE	2300 MHz (WCS)	4	30

*Table 1: Channel Data Table*

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	101
A	2	CCI HPA-65R-BUU-H6	101
A	3	Kathrein 800-10965	101
A	4	CCI OPA-65R-LCUU-H6	101
B	1	Powerwave 7770	101
B	2	CCI HPA-65R-BUU-H6	101
B	3	Kathrein 800-10965	101
B	4	CCI OPA-65R-LCUU-H6	101
C	1	Powerwave 7770	101
C	2	CCI HPA-65R-BUU-H6	101
C	3	Kathrein 800-10965	101
C	4	CCI OPA-65R-LCUU-H6	101

*Table 2: Antenna Data*

All calculations were done with respect to uncontrolled / general population threshold limits.



## RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.10
Antenna A2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	6	200	4,835.86	2.50
Antenna A3	Kathrein 800-10965	700 MHz (Band 14) / 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	4.39
Antenna A4	CCI OPA-65R-LCUU-H6	2300 MHz (WCS)	15.45	4	120	4,209.02	1.68
Sector A Composite MPE%							<b>9.67</b>
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.10
Antenna B2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	6	200	4,835.86	2.50
Antenna B3	Kathrein 800-10965	700 MHz (Band 14) / 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	4.39
Antenna B4	CCI OPA-65R-LCUU-H6	2300 MHz (WCS)	15.45	4	120	4,209.02	1.68
Sector B Composite MPE%							<b>9.67</b>
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.10
Antenna C2	CCI HPA-65R-BUU-H6	700 MHz / 1900 MHz (PCS)	11.95 / 14.75	6	200	4,835.86	2.50
Antenna C3	Kathrein 800-10965	700 MHz (Band 14) / 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	4.39
Antenna C4	CCI OPA-65R-LCUU-H6	2300 MHz (WCS)	15.45	4	120	4,209.02	1.68
Sector C Composite MPE%							<b>9.67</b>

*Table 3: AT&T Emissions Levels*

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
AT&T – Max Sector Value	9.67 %
Verizon Wireless	28.59 %
Clearwire	0.34 %
<b>Site Total MPE %:</b>	<b>38.60 %</b>

*Table 4: All Carrier MPE Contributions*

AT&T Sector A Total:	9.67 %
AT&T Sector B Total:	9.67 %
AT&T Sector C Total:	9.67 %
Site Total:	38.60 %

*Table 5: Site MPE Summary*



FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
AT&T 850 MHz UMTS (Antenna 1)	2	414.12	101	3.30	850 MHz	567	0.58%
AT&T 1900 MHz (PCS) UMTS (Antenna 1)	2	656.33	101	5.23	1900 MHz (PCS)	1000	0.52%
AT&T 700 MHz LTE (Antenna 2)	2	626.70	101	4.99	700 MHz	467	1.07%
AT&T 1900 MHz (PCS) LTE (Antenna 2)	4	895.61	101	14.27	1900 MHz (PCS)	1000	1.43%
AT&T 700 MHz LTE – Band 14 (Antenna 3)	4	736.31	101	11.73	700 MHz	467	2.51%
AT&T 2100 MHz (AWS) LTE (Antenna 3)	4	1,180.65	101	18.81	2100 MHz (AWS)	1000	1.88%
AT&T 2300 MHz (WCS) LTE (Antenna 4)	4	1,052.26	101	16.77	2300 MHz (WCS)	1000	1.68%
						<b>Total:</b>	<b>9.67%</b>

*Table 6: AT&T Maximum Sector MPE Power Values*

## Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	9.67 %
Sector B:	9.67 %
Sector C:	9.67 %
AT&T Maximum Total (per sector):	9.67 %
Site Total:	38.60 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **38.60 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

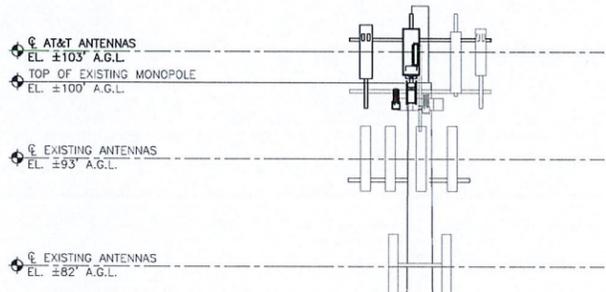
FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.



Scott Heffernan  
 RF Engineering Director  
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 95 Ryan Drive, Suite 1  
 Raynham, MA 02767





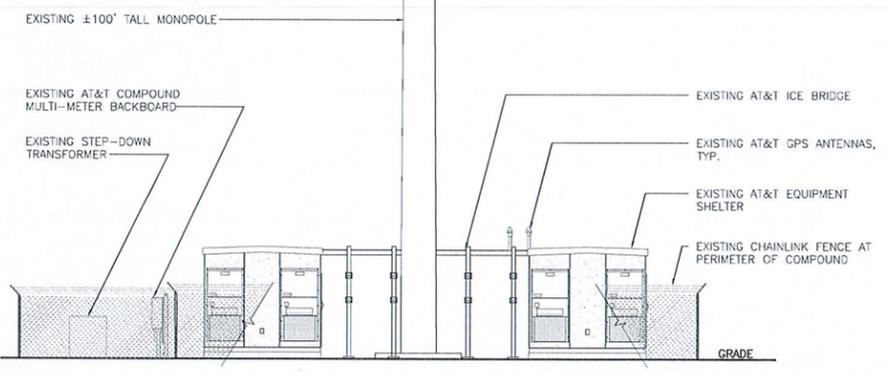


**TOWER STRUCTURAL NOTES:**

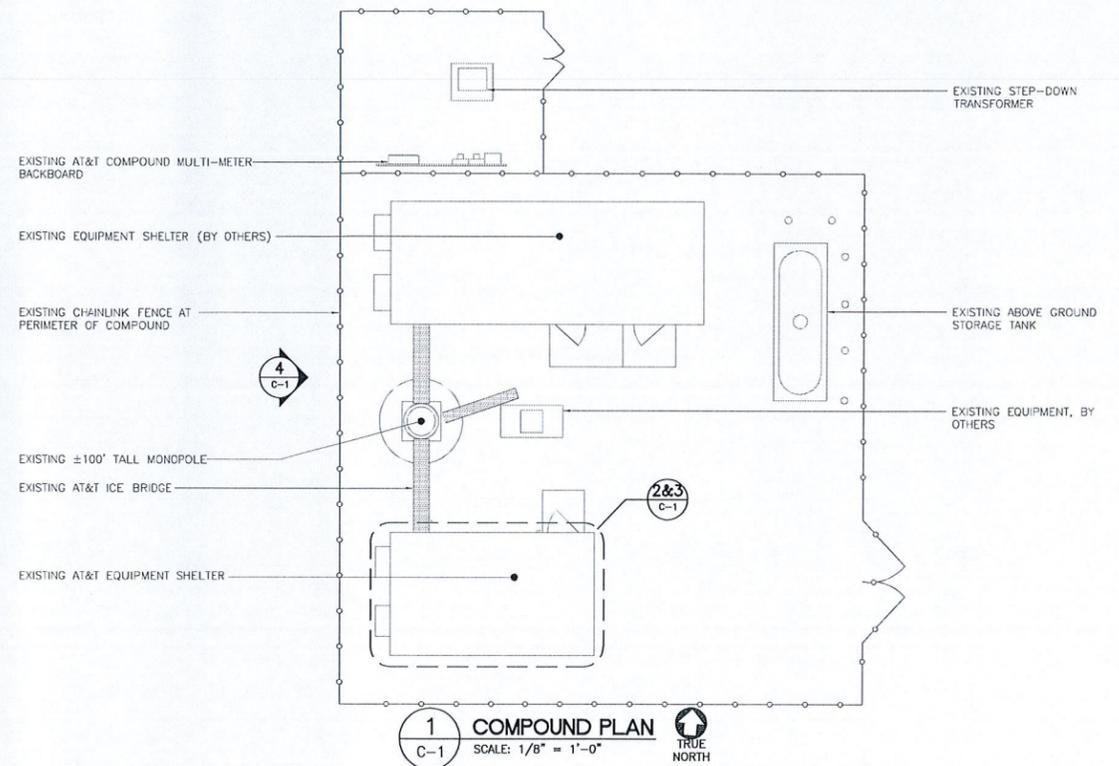
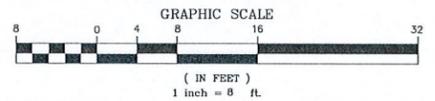
1. TOWER STRUCTURAL ANALYSIS SIGNED & SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

**NOTES:**

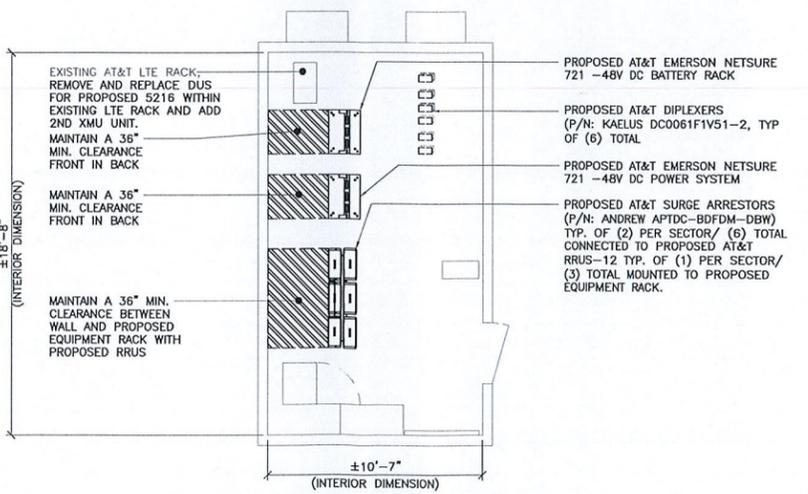
1. A.G.L. = ABOVE GRADE LEVEL



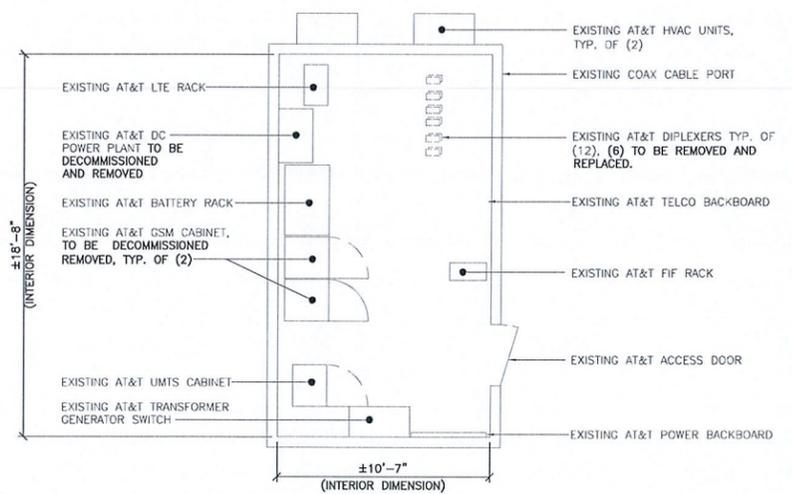
**4 PROPOSED TOWER ELEVATION**  
C-1 SCALE: 1/8" = 1'-0"



**1 COMPOUND PLAN**  
C-1 SCALE: 1/8" = 1'-0" TRUE NORTH



**3 PROPOSED EQUIPMENT LAYOUT PLAN**  
C-1 SCALE: 1/4" = 1'-0" TRUE NORTH



**2 EXISTING EQUIPMENT LAYOUT PLAN**  
C-1 SCALE: 1/4" = 1'-0" TRUE NORTH

REV.	DATE	DWD	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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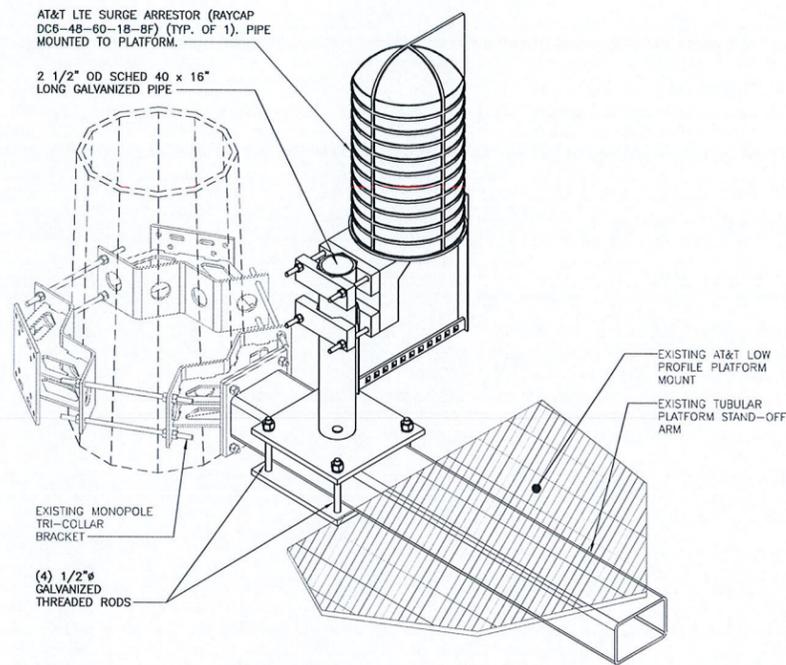


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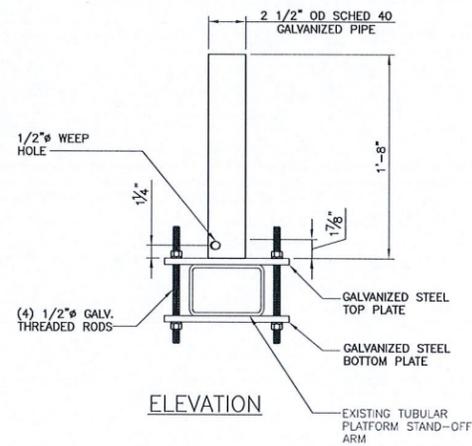
**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY  
**EAST HARTFORD HOCHANUM**  
**CT5126 - LTE 3C/4C/5C/RETRO/6C**  
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HARTFORD, CT 06114

DATE: 01/02/19  
SCALE: AS NOTED  
JOB NO. 18000.09

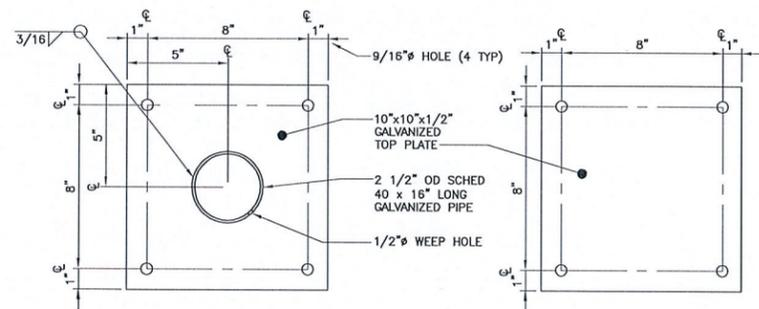
COMPOUND PLAN AND ELEVATION



ISOMETRIC



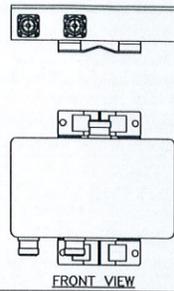
ELEVATION



TOP PLATE (PLAN VIEW)

BOTTOM PLATE (PLAN VIEW)

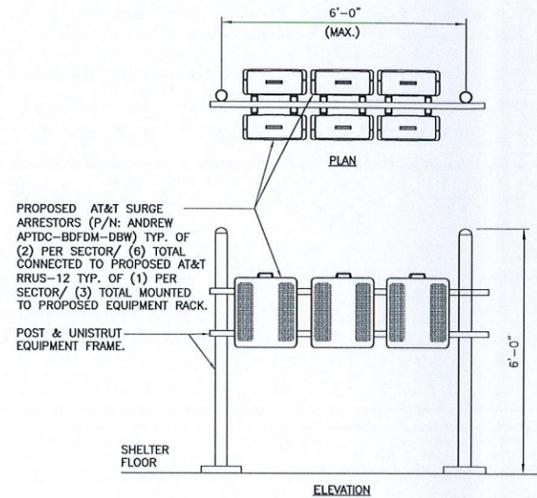
1 RAYCAP DC6 MOUNTING DETAIL  
C-2 SCALE: 1 1/2" = 1'-0"



DIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KAEIUS MODEL: DBC0061F1V51-2	8.0"H x 6.2"W x 3.2"D	9.5 LBS.

NOTES:  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

2 DIPLEXER DETAIL  
C-2 SCALE: NONE



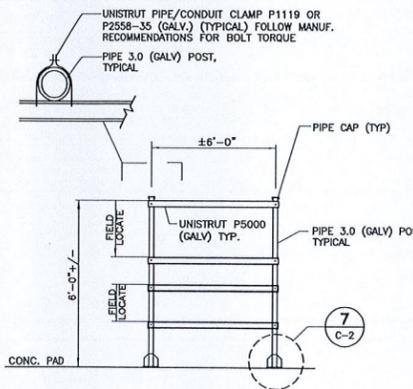
5 PROPOSED EQUIPMENT RACK  
C-2 SCALE: 1/2" = 1'-0"



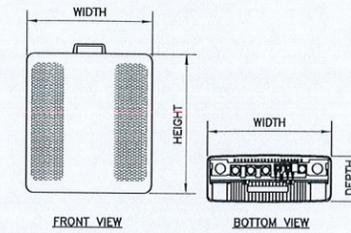
SURGE ARRESTOR		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ANDREW MODEL: APTDC-BDFDM-DBW	3.46"H x 3.46"W x 1.65"D	1.32 LBS.

NOTES:  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

3 ANDREW APTDC-BDFDM-DBW DETAIL  
C-2 SCALE: NOT TO SCALE



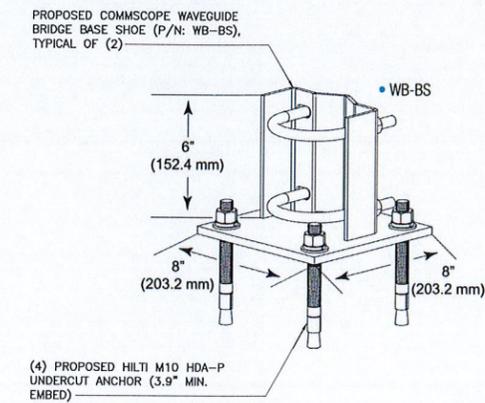
6 PROPOSED EQUIPMENT FRAME DETAIL  
C-2 SCALE: NOT TO SCALE



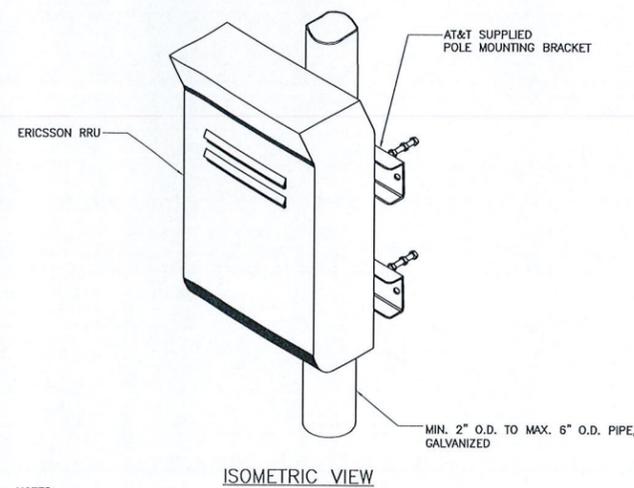
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRU 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

4 ERICSSON RRU 12 DETAIL  
C-2 SCALE: 1" = 1'-0"



7 EQUIPMENT FRAME POST ATTACHMENT DETAIL  
C-2 SCALE: NOT TO SCALE

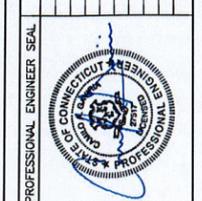


NOTES:

- AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
- NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

8 TYPICAL RRU MOUNTING DETAILS  
C-2 SCALE: NTS

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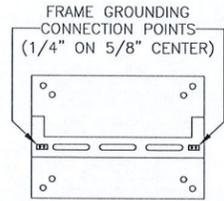


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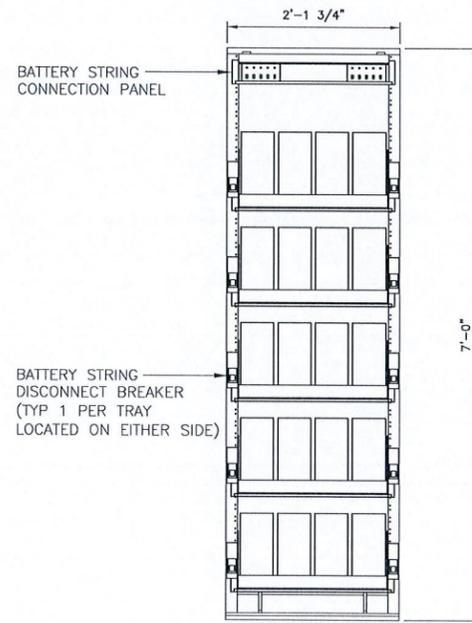
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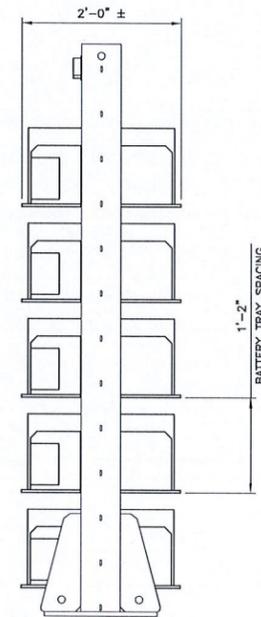
DETAILS  
C-2  
Sheet No. 4 of 9



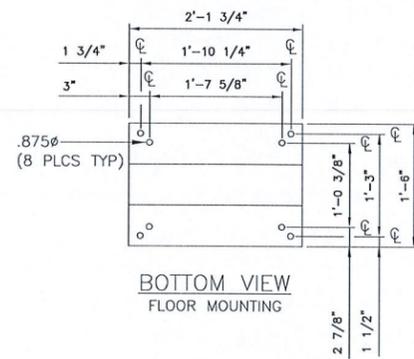
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FOR CLARITY



FRONT VIEW



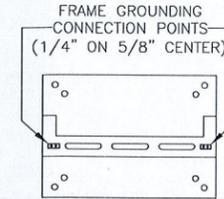
RIGHT SIDE VIEW



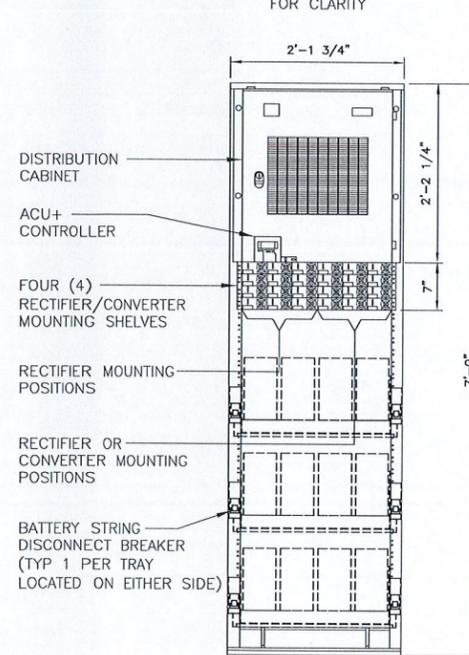
BOTTOM VIEW  
FLOOR MOUNTING

RACK WEIGHT W/O BATTERIES = 600lbs  
W/(20) 155AHR BATTERIES = 3000lbs  
SEISMIC ZONE 4 COMPLIANT

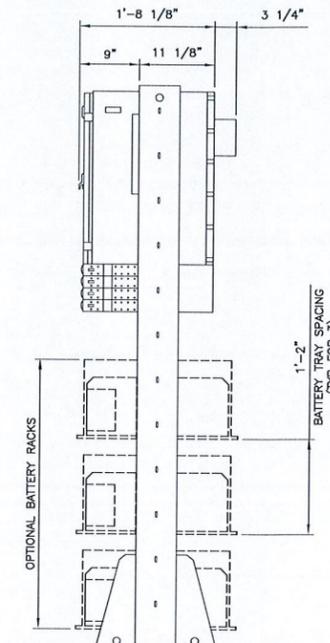
1 EMERSON NETSURE 721 -48V DC BATTERY RACK  
C-3 SCALE: 1" = 1'-0"



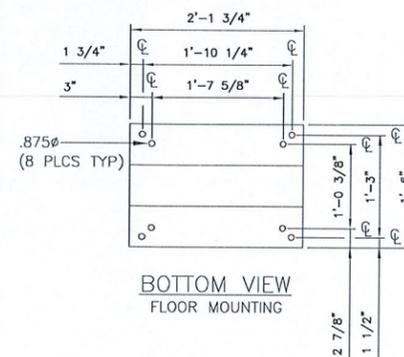
TOP VIEW  
EQUIPMENT NOT SHOWN  
FOR CLARITY



FRONT VIEW



RIGHT SIDE VIEW



BOTTOM VIEW  
FLOOR MOUNTING

RACK WEIGHT (EMPTY) = 500lbs  
R48-2000G3 RECTIFIER = 2.49lbs (ea.)  
C48/24-1500 CONVERTER = 2.49lbs (ea.)  
155AHR BATTERY = 119lbs (ea.)

SEISMIC ZONE 4 COMPLIANT

2 EMERSON NETSURE 721 -48V DC POWER SYSTEM  
C-3 SCALE: 1" = 1'-0"



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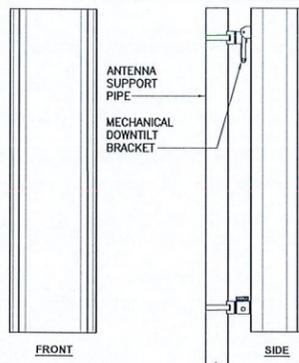
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DETAILS

C-3

Sheet No. 5 of 9

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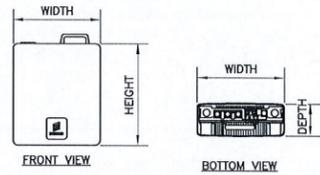


**BOTTOM**  
CCI  
OPA-65R-BUU-H6

**BOTTOM**  
KATHREIN  
800-10965

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: OPA-65R-BUU-H6	72.0"L x 14.8"W x 7.4"D	73.0 LBS.
MAKE: KATHREIN MODEL: 800-10965	78.7"L x 20.0"W x 6.9"D	108.6 LBS.

**5 PROPOSED ANTENNA DETAIL**  
SCALE: 1/2" = 1'-0"

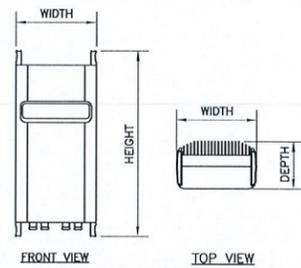


B14 4478

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: B14 4478	14.9"L x 13.1"W x 7.3"D	60 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

**NOTES:**  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

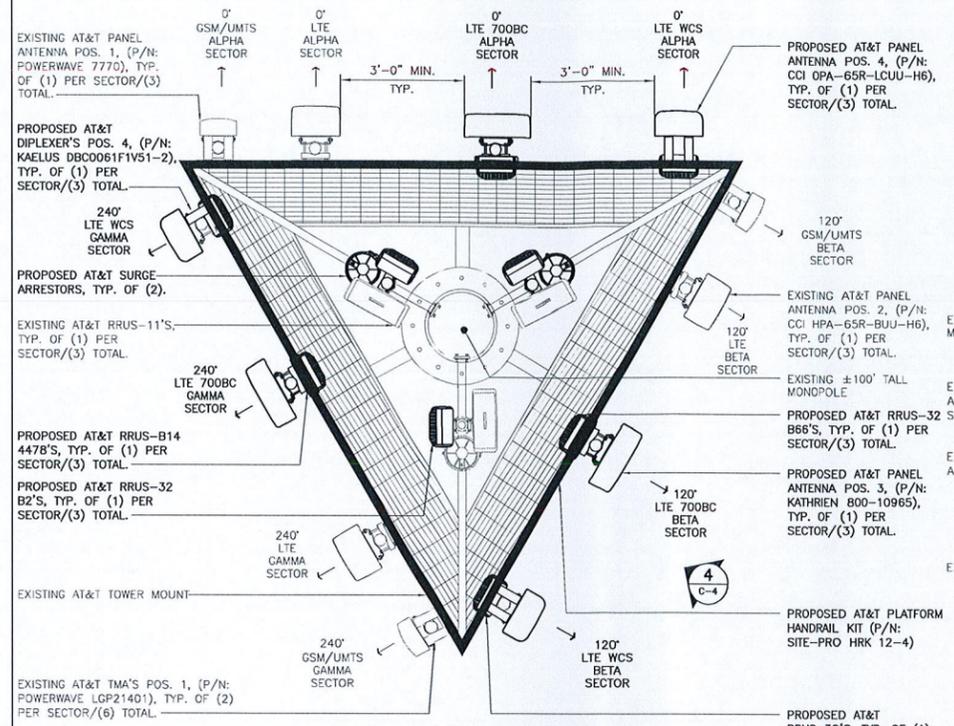
**6 ERICSSON B14 4478 DETAIL**  
SCALE: 1" = 1'-0"



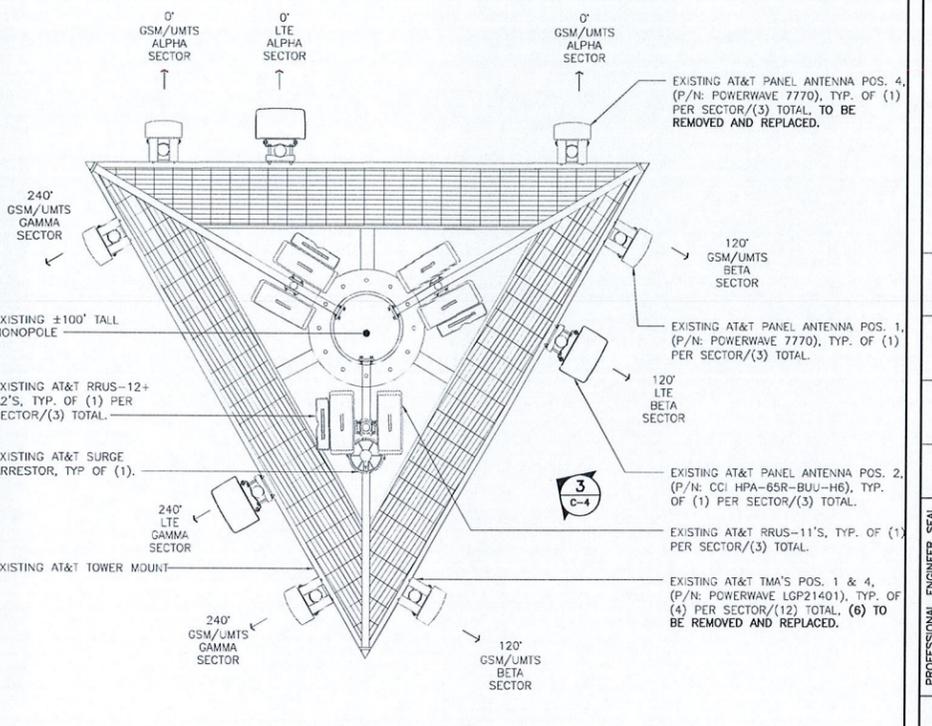
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRU32 B66	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
MAKE: ERICSSON MODEL: RRU32 B2	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

**NOTES:**  
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

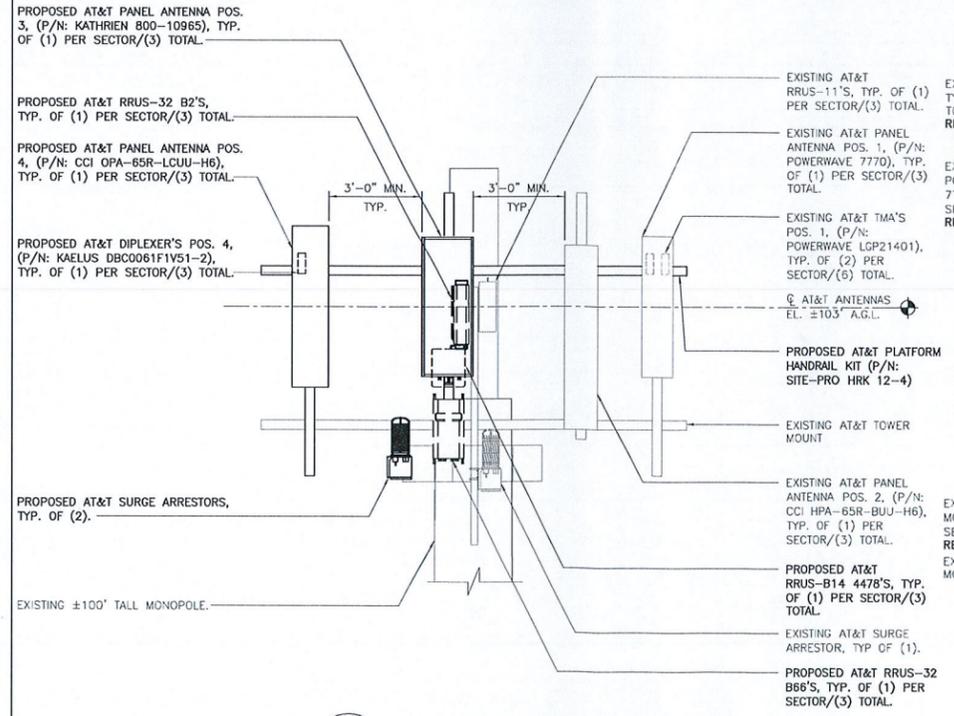
**7 ERICSSON REMOTE RADIO UNITS**  
SCALE: 1" = 1'-0"



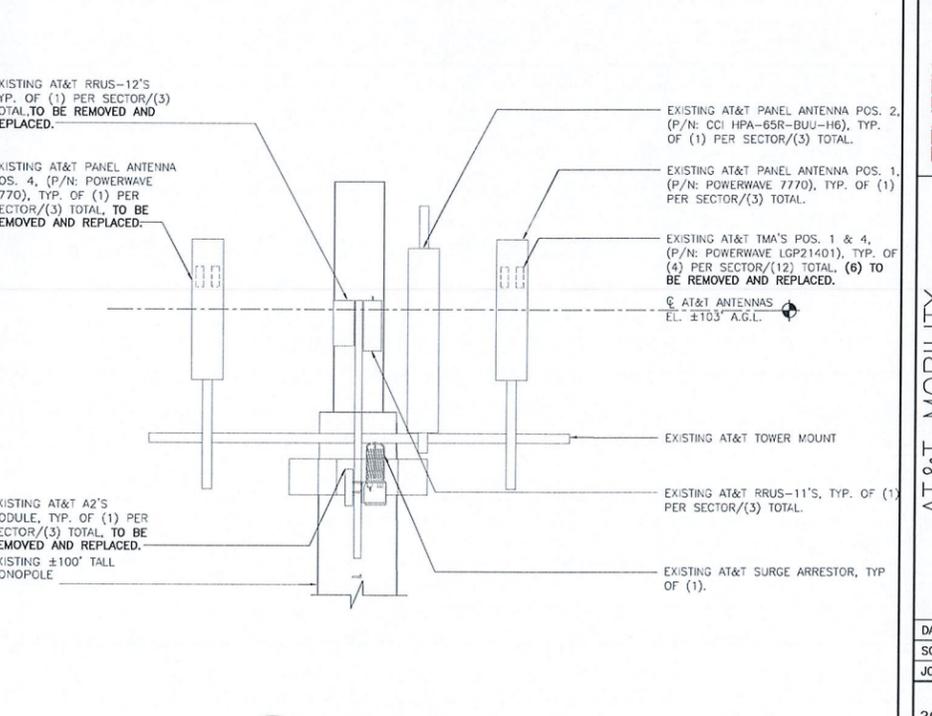
**2 PROPOSED ANTENNA PLAN**  
SCALE: 1/2" = 1'-0" NORTH



**1 EXISTING ANTENNA PLAN**  
SCALE: 1/2" = 1'-0" NORTH



**4 PROPOSED ANTENNA ELEVATION**  
SCALE: 3/8" = 1'-0"



**3 EXISTING ANTENNA ELEVATION**  
SCALE: 3/8" = 1'-0"

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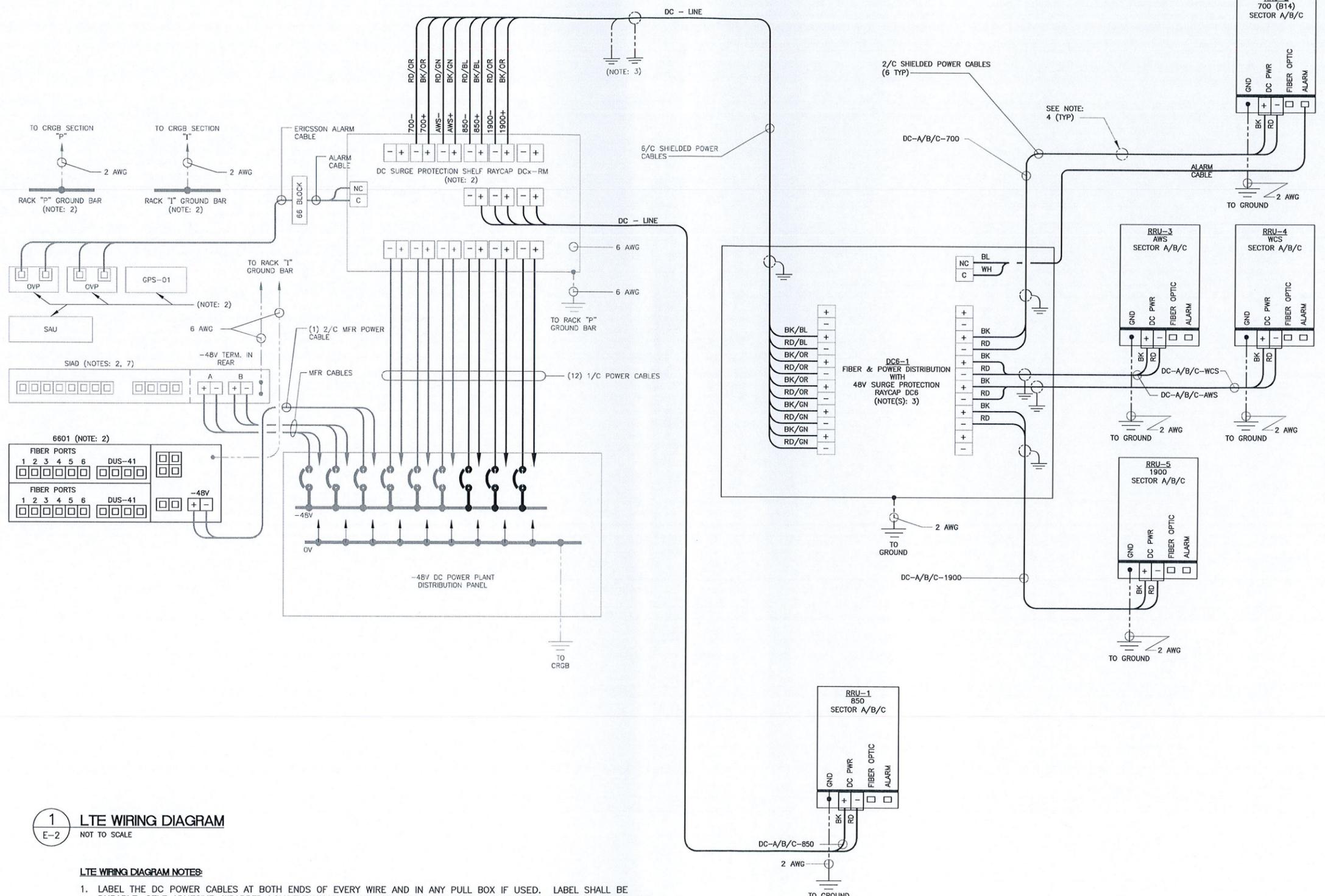
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LTE  
3C/4C/5C/RETRO/6C  
ANTENNA  
LAYOUTS

**C-4**  
Sheet No. 5 of 9





**1** LTE WIRING DIAGRAM  
E-2 NOT TO SCALE

**LTE WIRING DIAGRAM NOTES:**

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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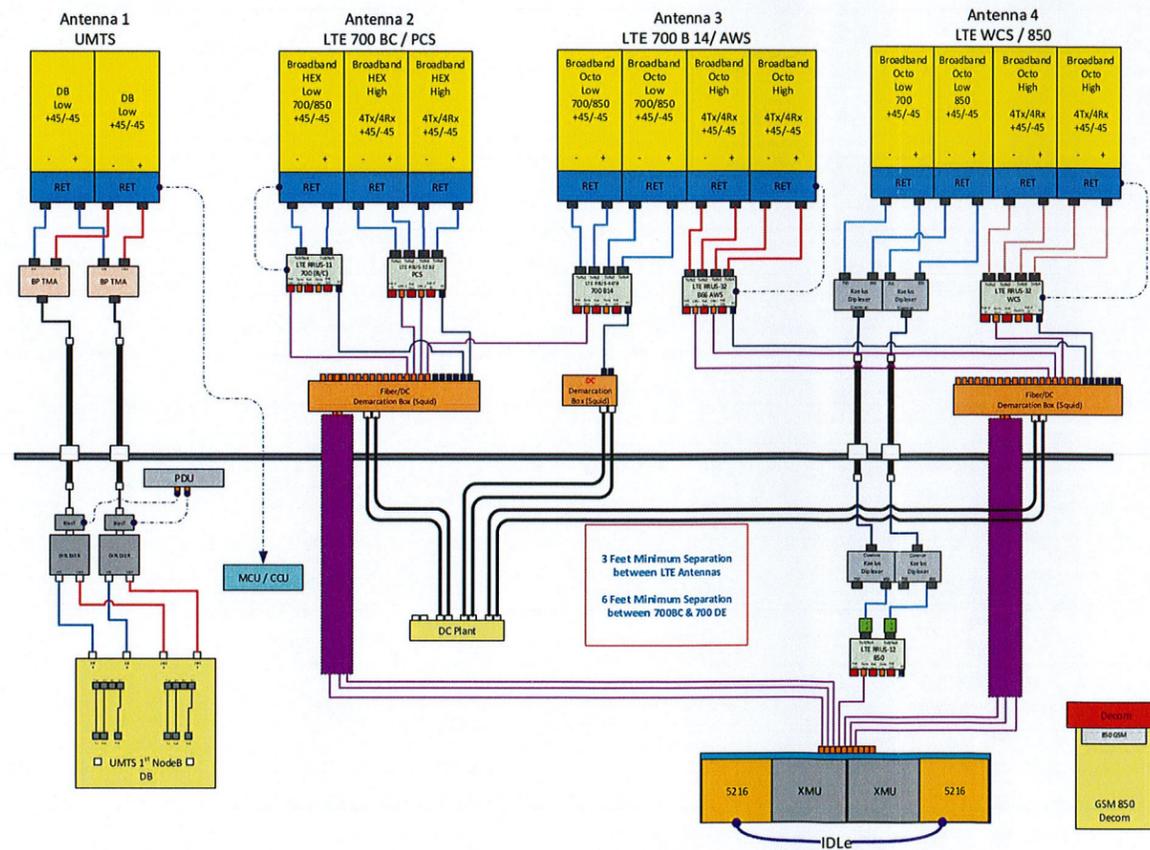
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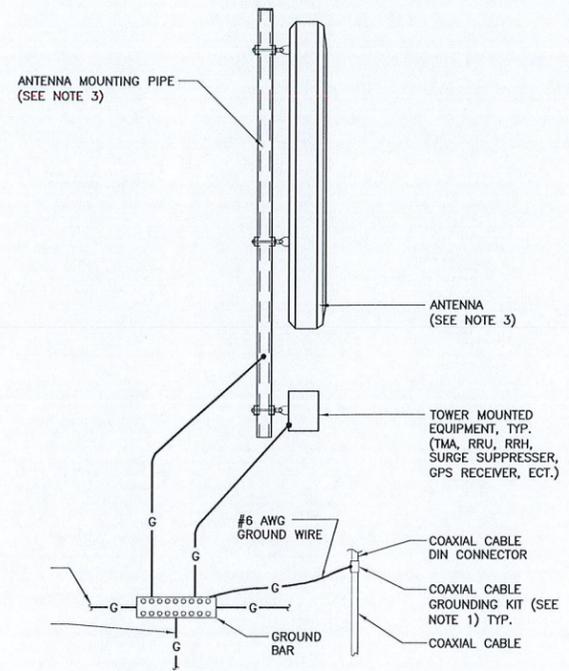
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LTE WIRING DIAGRAM

**E-2**  
Sheet No. 8 of 9



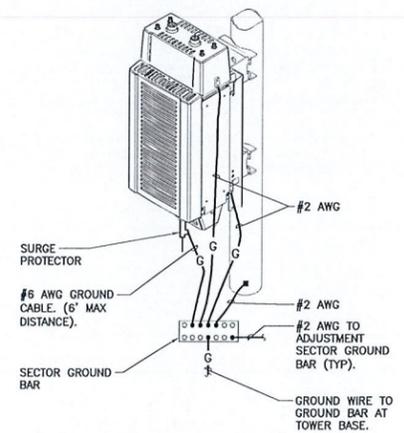
**3 RF PLUMBING DIAGRAM**  
 E-3 NOT TO SCALE



- NOTES:
- BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
  - BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
  - DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

**1 TYPICAL ANTENNA GROUNDING DETAIL**  
 E-3 NOT TO SCALE

- EACH RRU CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
- AT TOP OF THE CABINET
  - AT RIGHT SIDE OF THE CABINET.



**2 RRU POLE MOUNT GROUNDING**  
 E-3 NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS