



December 15<sup>th</sup>, 2017

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

**Re: Notice of Exempt Modification – Antenna Swap and RRU Add**  
**Property Address: 426 River Rd. Willington, CT 06279**  
**Applicant: AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, 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).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 113-feet on an existing 110-foot monopole, owned by Crown Castle at 12 Gill St. Suite 5800, Woburn, MA 01801. AT&T now intends to swap (3) 4' Powerwave P65-15-XLH-RR for (3) 6' Quintel QS66512-2 Panel Antennas, each swap occurring in position [4], all sectors for a total of three (3) antennas being swapped. AT&T also wishes to add (2) RRUS-32 on position [4] all sectors, for a total of (6) RRUs 32s being added. Lastly, AT&T also intends to add (1) Raycap Squid as well as (2) DC Cables and (1) Fiber Cables to their configuration. All of the changes will take place on the existing antenna mount.

Per the attached Special Permit, issued by the Town of Willington Planning and Zoning Commission, the construction of the above mentioned tower was approved by the Willington Planning and Zoning Commission on August 15<sup>th</sup>, 2000.

In addition, 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.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §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., a copy of this letter is being sent to Jim Rupert, Building Official – Town of Willington, Building Department, 40 Old Farms Rd., Willington, CT 06279 and Erika Wiecewski – First Selectman, Building Department, 40 Old Farms Rd., Willington, CT 06279. A copy of this letter is also being sent to the property owner Willington Fire Department Inc., PO BOX 161, Willington, CT 06279 and to the tower company, Crown Castle, 12 Gill St. Suite 5800, Woburn, MA 01801.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-CING-054-057-061-160-161-070815** - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 366 Three Mile Road, Glastonbury; Butternut Hollow Road, Greenwich; 599 Plains Road, Haddam; 111 Trask Road/426 River Road, Willington; and 128 Mather Street, Wilton, Connecticut.
- **EM-CING-160-110727** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 426 River Road, Willington, Connecticut.
- **EM-AT&T-160-120629** – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 426 River Road, Willington, Connecticut.



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).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 113-foot level of the 110-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 modifications will not increase the noise levels 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 the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in [Tab 2](#).
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in [Tab 3](#)).

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A. §16-50j-72(b) (2).

Sincerely,

A handwritten signature in black ink that reads 'Romina Kirchmaier'.

Romina Kirchmaier

CC w/enclosures:  
Jim Rupert, Building Official, Town of Willington  
Erika Wiczenski, First Selectman – Town of Willington  
Willington Fire Department Inc., LLC, Land Owner  
Crown Castle, Tower Company

TOWN OF WILLINGTON  
PLANNING AND ZONING COMMISSION

SPECIAL PERMIT

Date: 9/26/2000

This is to certify that the use: **Monopole Antenna Tower and Support Building for Wireless Communications Facility** located on **426 River Road** Assessors Map **34**, lot **10**, Zone **R80** has been approved **with conditions** by the Willington Planning and Zoning Commission on **8/15/2000** pursuant to **Section 13** of the Town of Willington Zoning Regulations, which findings are on file with the Commission.

Owner of Record: Willington Fire Department #1

  
Agent

Conditions:

- 1) Prior to the start of construction, any FCC and FAA approvals shall be provided to the zoning agent.
- 2) As stated at the public hearing, the applicant shall agree to comply with any technical revisions suggested by the town engineer and/or the zoning agent, and updated drawings to reflect those revisions shall be provided.
- 3) The driveway shall meet zoning regulations, as they may be waived by the zoning agent.
- 4) The elevation of the top of any antenna shall not exceed 642 feet above sea level.
- 5) The exterior lighting switch shall be arranged so any exterior lighting is not on all the time, but rather only when required by workers.
- 6) All easements shall be depicted on the final site plan
- 7) A gate shall be provided on the northeast access road at the location of the barbed wire fence.

Received for record October 25, 00  
At Willington Planning and Zoning Commission

Applicant should obtain a copy of the Zoning Regulations which detail specific requirements.

TOWN OF WILLINGTON  
Planning and Zoning Commission  
40 Old Farms Road, Willington, CT 06279

Application for: Special Permit  Amendment Site Plan Approval Modification

Location of property: 426 River Road, Willington, Connecticut 06279

Assessors Map #: 34 Assessors Lot #: 10 Existing Zone: R-80 Area of property: 12.6 acres

Historical District Certificate of Appropriateness is attached to this application (if applicable): N/A

Special Permit Requested: Construction of monopole and support building

Names, addresses and telephone numbers of owner/owners:

Willington Fire Department, Inc. #1 c/o Chief Tyler Millix, P.O. Box 161  
426 River Road, Willington, Connecticut 06279 (860-429-0288)

Name, address and telephone number of petitioner if other than owner:

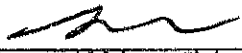
N/A

Description of existing and proposed use of land and buildings:

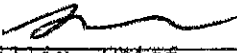
Existing use: Willington Fire Department, Inc. facility

Proposed use: Construction of a monopole and support building for a wireless communications facility and improvements to existing access driveway pursuant to Sections 7.06.04 and 7.06.04.06 of the zoning regulations.

Please submit with this application form all data and maps required in Section 13 of the Zoning Regulations. The undersigned owner(s) of the property hereby authorizes the Planning and Zoning Commission or their agent to enter and inspect premises at any reasonable hour.

Signature of owner(s):  Date: May 12, 2000  
Tyler Millix, Chief  
Willington Fire Dept., Inc. #1 Date: \_\_\_\_\_

I (we) the undersigned petitioner(s) understand that the submission of inaccurate or incomplete information shall be grounds for denial of this application by the P.Z.C.

Signature(s):  Date: May 12, 2000  
Tyler Millix, Chief  
Willington Fire Dept., Inc. #1 Date: \_\_\_\_\_

\*List of property owners within five hundred (500) feet of subject property attached hereto as Exhibit A.  
A.SPECIAL



200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728  
703.276.1100 • 703.276.1169 fax  
info@sitesafe.com • www.sitesafe.com



**SmartLink, LLC on behalf of  
AT&T Mobility, LLC  
Site FA – 10035261  
Site ID – CT1105 (MRCTB025392-  
MRCTB025402)  
USID – 59382  
Site Name – Willington - River  
Road  
Site Compliance Report**

**426 River Road  
Willington, CT 06279**

Latitude: N41-53-26.67  
Longitude: W72-17-21.80  
Structure Type: Monopole

Report generated date: December 9, 2017  
Report by: Leo Romero  
Customer Contact: Romina Kirchmaier

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**AT&T Mobility, LLC will be compliant when the  
remediation recommended in Section 5.2 or  
other appropriate remediation is implemented.**

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# 1 General Site Summary

## 1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	No
RF Sign(s) @ antennas	No
Barrier(s) @ sectors	No
Max cumulative simulated RFE level on the Ground Level	<1% General Public Limit at AT&T Mobility, LLC Alpha, Beta and Gamma Sectors
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND\_CONNECTICUT\_CTV1105\_2018-LTE-Multi-Carrier\_LTE\_sp656b\_2051A0D6QH\_10035261\_59382\_06-21-2017\_Final-Approved\_v1.00

CD's: 10035261\_AE201\_171103\_CTL01105\_REV1

RF Powers Used: RFDS ERP Values and AT&T Engineering Defaults

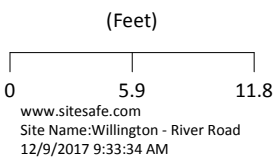
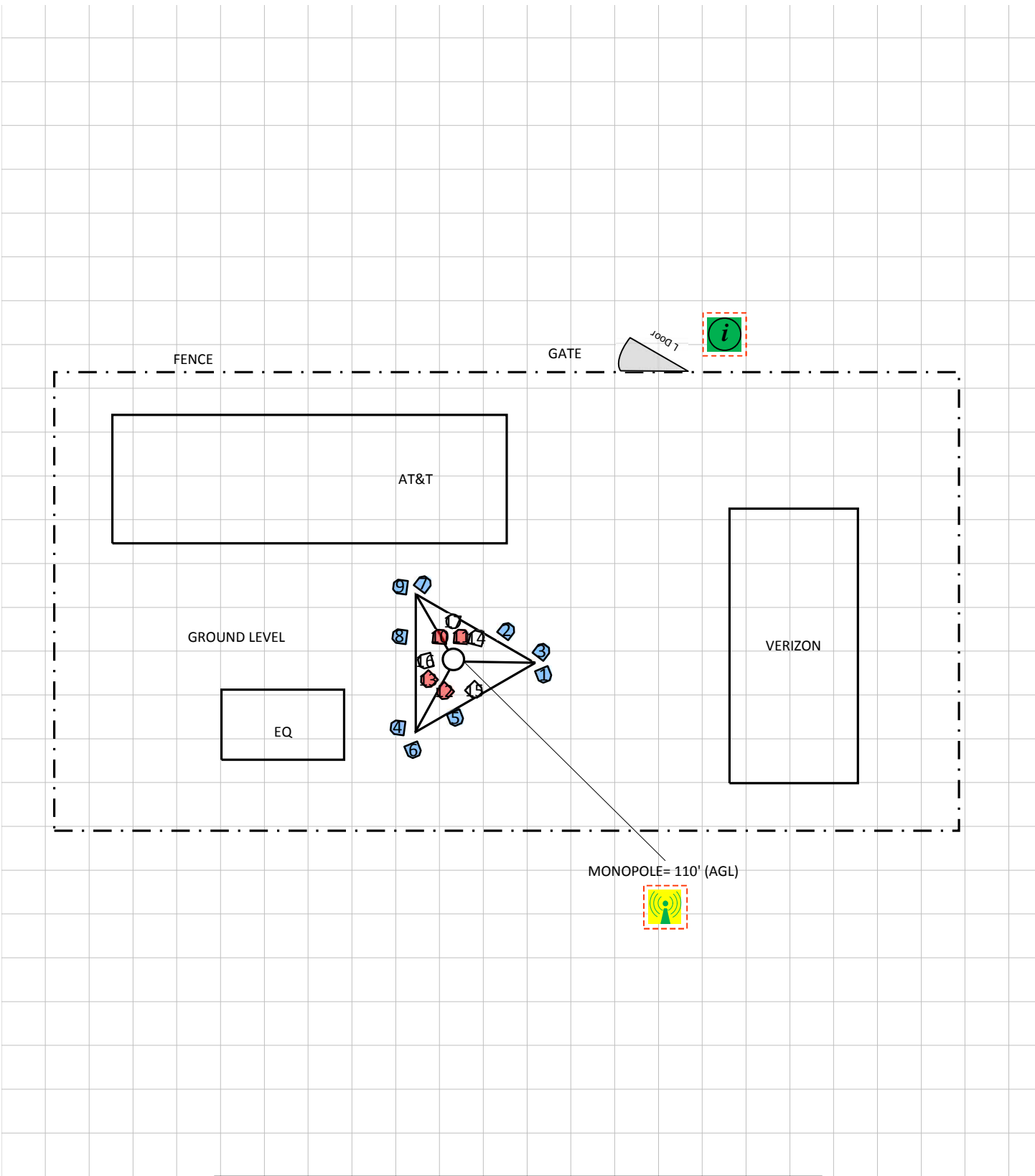
## 2 Scale Maps of Site

The following diagrams are included:

- ) Site Scale Map
- ) RF Exposure Diagram
- ) AT&T Mobility, LLC Contribution
- ) Elevation View



# Site Scale Map For: Willington - River Road



Carrier Identification					
	AT&T MOBILITY LLC		VERIZON WIRELESS		T-MOBILE
	SPRINT		UNKNOWN CARRIER		
Sign Legend					
	Caution		Caution+Info		Notice
	Warning		NOC/Info		Info 2
Barrier			Proposed Barriers/ Signs		

### 3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	850	143	63	4.3	12.61	0	1	0	1459.1	79.6'	89.8'	110.9'
1	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	1900	143	61	4.3	13.71	0	1	0	1879.7	79.6'	89.8'	110.9'
2	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	23	65	6	13.36	0	0	1	1300.6	76.4'	93.6'	110'
3	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	23	68	6	14.16	0	0	1	3664.4	79.5'	91.8'	110'
3	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	23	64	6	14.56	0	0	1	1285.3	79.5'	91.8'	110'
4	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	850	263	63	4.3	12.61	0	1	0	1459.1	67.1'	85.3'	110.9'
4	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	1900	263	61	4.3	13.71	0	1	0	1879.7	67.1'	85.3'	110.9'
5	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	143	65	6	13.36	0	0	1	1300.6	72.1'	86.1'	110'
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	143	68	6	14.16	0	0	1	3664.4	68.4'	83.3'	110'
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	143	64	6	14.56	0	0	1	1285.3	68.4'	83.3'	110'
7	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	850	23	63	4.3	12.61	0	1	0	1459.1	69.3'	97.6'	110.9'
7	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	1900	23	61	4.3	13.71	0	1	0	1879.7	69.3'	97.6'	110.9'
8	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	263	65	6	13.36	0	0	1	1300.6	67.3'	93.1'	110'
9	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	1900	263	68	6	14.16	0	0	1	3664.4	67.3'	97.3'	110'
9	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2300	263	64	6	14.56	0	0	1	1285.3	67.3'	97.3'	110'
10	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	751	350	66	4.6	11.29	-	-	-	807.5	70.7'	93'	80.7'
10	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	2100	350	62	4.6	14.6	-	-	-	1730.4	70.7'	93'	80.7'
11	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	850	350	61	4.6	11.47	-	-	-	1122.3	72.5'	93'	80.7'
11	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	1900	350	65	4.6	14.65	-	-	-	1750.5	72.5'	93'	80.7'
12	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	751	210	66	4.6	11.29	-	-	-	807.5	71.1'	88.3'	80.7'
12	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	2100	210	62	4.6	14.6	-	-	-	1730.4	71.1'	88.3'	80.7'
13	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	850	210	61	4.6	11.47	-	-	-	1122.3	69.7'	89.3'	80.7'
13	VERIZON WIRELESS	Andrew SBNHH-1D65A	Panel	1900	210	65	4.6	14.65	-	-	-	1750.5	69.7'	89.3'	80.7'
14	UNKNOWN CARRIER	Generic Panel	Panel	1900	0	65	4.6	15.43	-	-	-	2094.8	73.8'	92.9'	99.7'
15	UNKNOWN CARRIER	Generic Panel	Panel	1900	120	65	4.6	15.43	-	-	-	2094.8	73.7'	88.4'	99.7'
16	UNKNOWN CARRIER	Generic Panel	Panel	1900	240	65	4.6	15.43	-	-	-	2094.8	69.5'	91'	99.7'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave P65-15-XLH-RR	Panel	850	143	63	4.3	12.61	0	1	0	1459.1	79.6'	89.8'	110.9'
17	UNKNOWN CARRIER	Generic Omni	Omni	450	0	360	4.7	2.97	-	-	-	100	71.8'	94.3'	68.6'

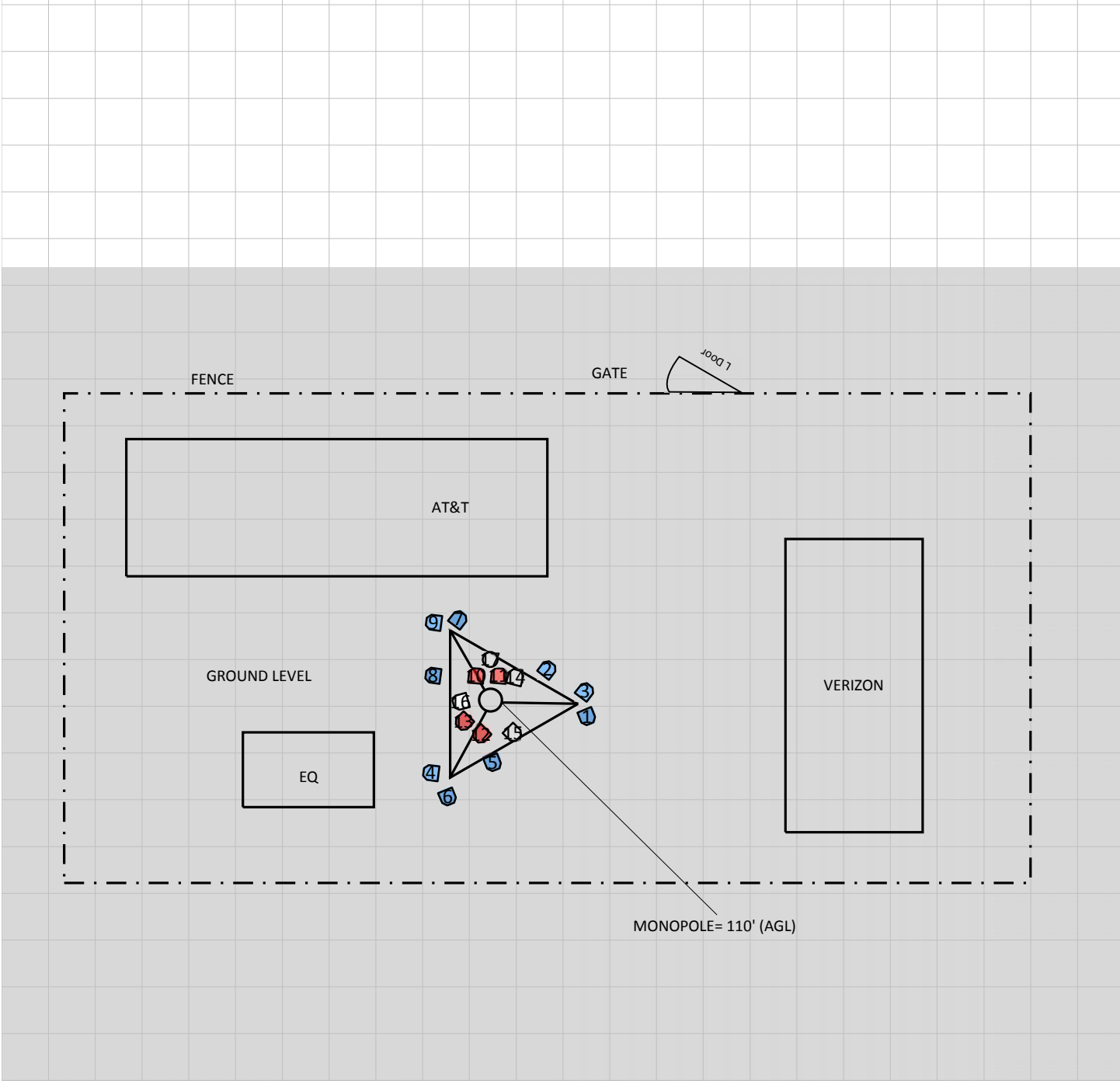
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level (AGL)**. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

## 4 Emission Predictions

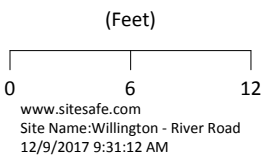
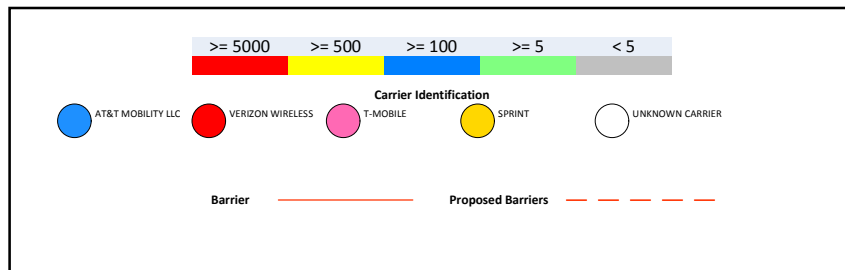
In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

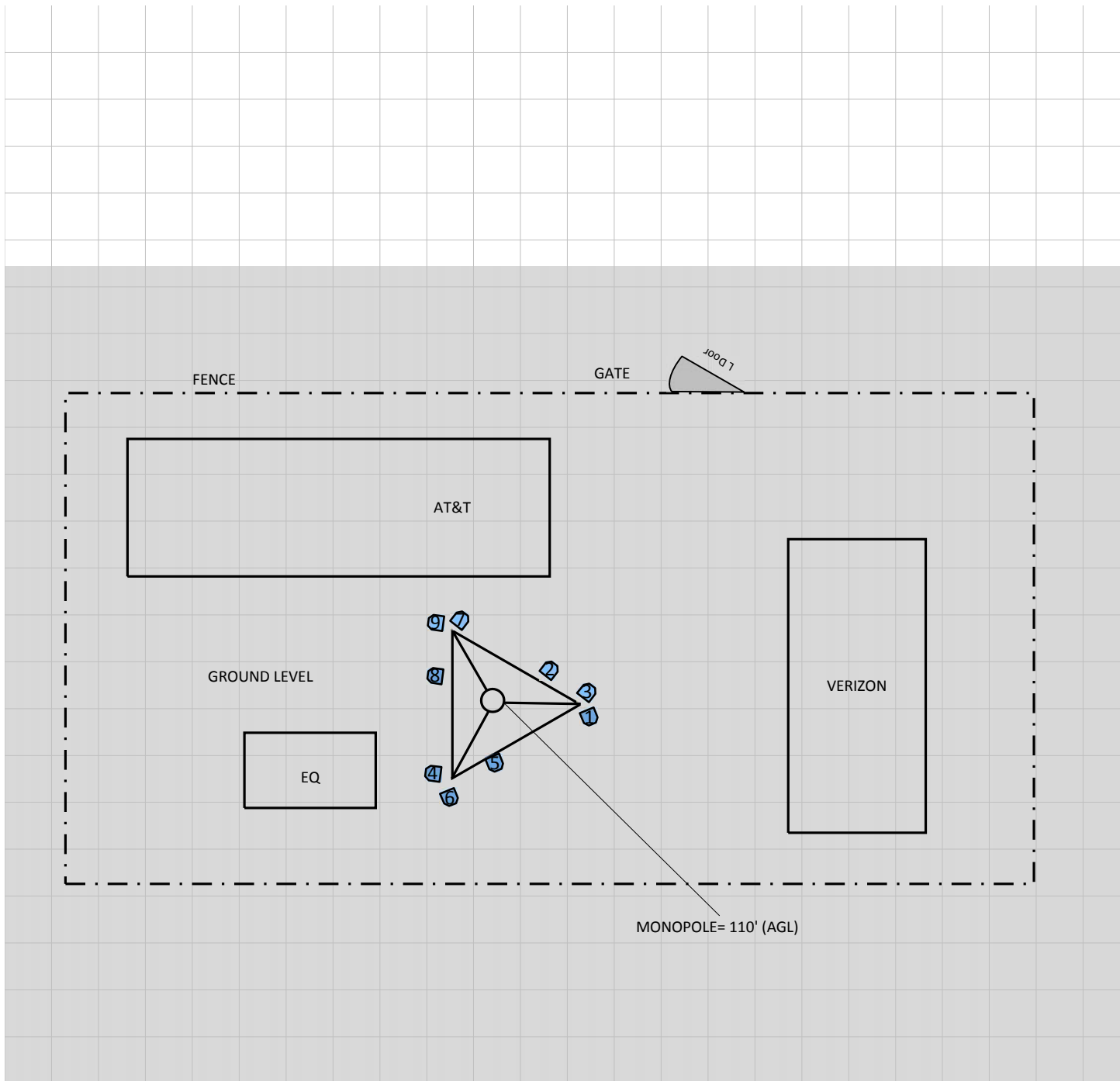
# RF Exposure Simulation For: Willington - River Road



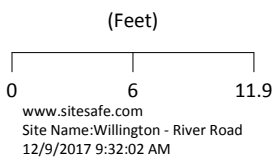
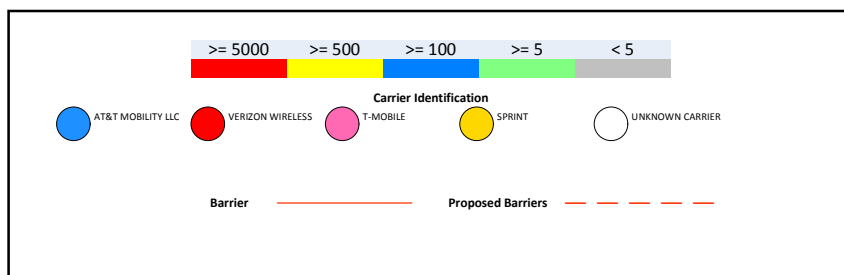
% of FCC Public Exposure Limit  
Spatial average 0' - 6'



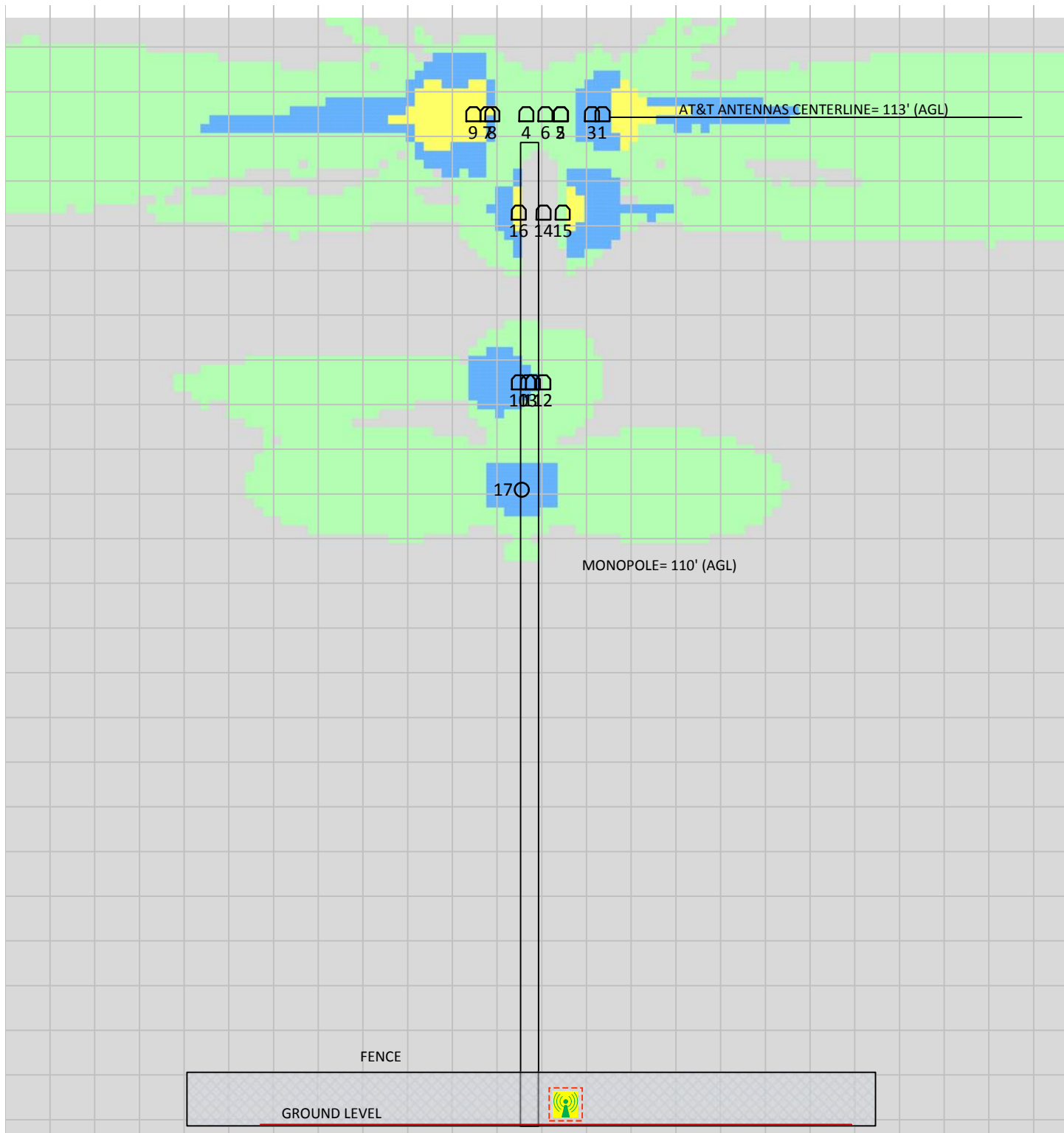
# RF Exposure Simulation For: Willington - River Road AT&T Mobility, LLC Contribution



% of FCC Public Exposure Limit  
Spatial average 0' - 6'










# RF Exposure Simulation For: Willington - River Road Elevation View



% of FCC Public Exposure Limit

(Feet)  
 0      8.4      16.8  
 www.sitesafe.com  
 Site Name: Willington - River Road  
 12/9/2017 9:37:55 AM

Carrier Identification				
<span style="color: blue;">●</span> AT&T MOBILITY LLC	<span style="color: red;">●</span> VERIZON WIRELESS	<span style="color: pink;">●</span> T-MOBILE	<span style="color: yellow;">●</span> SPRINT	<span style="color: black;">○</span> UNKNOWN CARRIER
Sign Legend				
 Caution 1	 Caution 2	 Notice 2	 Notice 1	 Warning
			 Info 1	 Info 2
Barrier		Proposed Barriers/ Signs		
—————		- - - - -		

## 5 Site Compliance

### 5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

### 5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

#### **Base of Monopole**

Caution 2 sign required.

#### **Compound Gate**

Information 1 sign required.



## 6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Leo Romero.

December 9, 2017



## Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

## Appendix B – Regulatory Background Information

### FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 (“OET Bulletin 65”), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

FCC regulations define two separate tiers of exposure limits: Occupational or “Controlled environment” and General Public or “Uncontrolled environment”. The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

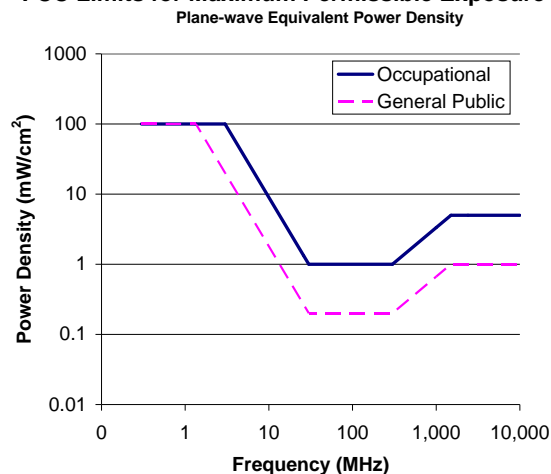
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:

**FCC Limits for Maximum Permissible Exposure (MPE)**



### Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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

### Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (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

## OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

## Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

**General Maintenance Work:** Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

**Training and Qualification Verification:** All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

**Physical Access Control:** Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- ) Locked door or gate
- ) Alarmed door
- ) Locked ladder access
- ) Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

**RF Signage:** Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

**Assume all antennas are active:** Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

**Maintain a 3 foot clearance from all antennas:** There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

**Site RF Emissions Diagram:** Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

## Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- J Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit.**
- J Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- J Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers.**
- J Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.**
- J Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

## Appendix E – Assumptions and Definitions

### General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

### Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

## Definitions

**5% Rule** – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

**Compliance** – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

**Decibel (dB)** – A unit for measuring power or strength of a signal.

**Duty Cycle** – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

**Effective (or Equivalent) Isotropic Radiated Power (EIRP)** – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

**Effective Radiated Power (ERP)** – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

**Gain (of an antenna)** – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

**General Population/Uncontrolled Environment** – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

**Generic Antenna** – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

**Isotropic Antenna** – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

**Maximum Measurement** – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

**Maximum Permissible Exposure (MPE)** – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

**Occupational/Controlled Environment** – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the



potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

**OET Bulletin 65** – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

**OSHA (Occupational Safety and Health Administration)** – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit [www.osha.gov](http://www.osha.gov).

**Radio Frequency (RF)** – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

**Radio Frequency Exposure (RFE)** – The amount of RF power density that a person is or might be exposed to.

**Spatial Average Measurement** – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

**Transmitter Power Output (TPO)** – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

## Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

[http://www.cancer.org/docroot/PED/content/PED\\_1\\_3X\\_Cellular\\_Phone\\_Towers.asp?sitearea=PED](http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED)

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

[http://ec.europa.eu/health/ph\\_risk/committees/04\\_scenihp/docs/scenihp\\_o\\_022.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf)

Fairfax County, Virginia Public School Survey

<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-ionising Radiation

[http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb\\_C/1317133826368](http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368)

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>

StartAntennaData It is advisable to provide an ID (ant 1) for all antennas

ID	Name	Freq (MHz)	Trans Power	Trans Count	Coax Len	Coax Type	Other Losses	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain	BWdth Pt Dir	Uptime Profile	ON flag
1	AT&T MOB	850	80	1	0			80		Powerwave	P65-15-XLF	79.6	89.75	110.875	Panel	4.25	12.61	63;143	100%	ON•
1	AT&T MOB	1900	80	1	0			80		Powerwave	P65-15-XLF	79.6	89.75	110.875	Panel	4.25	13.71	61;143	100%	ON•
2	AT&T MOB	737	60	1	0			60		KMW	AM-X-CD-1	76.43	93.56	110	Panel	6	13.36	65;23	100%	ON•
3	AT&T MOB	1900	140.6057	1	0			140.6057		Quintel	QS66512-2	79.45	91.78	110	Panel	6	14.16	68;23	100%	ON•
3	AT&T MOB	2300	44.97845	1	0			44.97845		Quintel	QS66512-2	79.45	91.78	110	Panel	6	14.56	64;23	100%	ON•
4	AT&T MOB	850	80	1	0			80		Powerwave	P65-15-XLF	67.09	85.25	110.875	Panel	4.25	12.61	63;263	100%	ON•
4	AT&T MOB	1900	80	1	0			80		Powerwave	P65-15-XLF	67.09	85.25	110.875	Panel	4.25	13.71	61;263	100%	ON•
5	AT&T MOB	737	60	1	0			60		KMW	AM-X-CD-1	72.06	86.06	110	Panel	6	13.36	65;143	100%	ON•
6	AT&T MOB	1900	140.6057	1	0			140.6057		Quintel	QS66512-2	68.43	83.31	110	Panel	6	14.16	68;143	100%	ON•
6	AT&T MOB	2300	44.97845	1	0			44.97845		Quintel	QS66512-2	68.43	83.31	110	Panel	6	14.56	64;143	100%	ON•
7	AT&T MOB	850	80	1	0			80		Powerwave	P65-15-XLF	69.28	97.56	110.875	Panel	4.25	12.61	63;23	100%	ON•
7	AT&T MOB	1900	80	1	0			80		Powerwave	P65-15-XLF	69.28	97.56	110.875	Panel	4.25	13.71	61;23	100%	ON•
8	AT&T MOB	737	60	1	0			60		KMW	AM-X-CD-1	67.26	93.06	110	Panel	6	13.36	65;263	100%	ON•
9	AT&T MOB	1900	140.6057	1	0			140.6057		Quintel	QS66512-2	67.31	97.31	110	Panel	6	14.16	68;263	100%	ON•
9	AT&T MOB	2300	44.97845	1	0			44.97845		Quintel	QS66512-2	67.31	97.31	110	Panel	6	14.56	64;263	100%	ON•
10	VERIZON W	751	60	1	0			60		Andrew	SBNHH-1D	70.7	93.03	80.7085	Panel	4.583	11.29	66;350	100%	ON•
10	VERIZON W	2100	60	1	0			60		Andrew	SBNHH-1D	70.7	93.03	80.7085	Panel	4.583	14.6	62;350	100%	ON•
11	VERIZON W	850	80	1	0			80		Andrew	SBNHH-1D	72.52	93.03	80.7085	Panel	4.583	11.47	61;350	100%	ON•
11	VERIZON W	1900	60	1	0			60		Andrew	SBNHH-1D	72.52	93.03	80.7085	Panel	4.583	14.65	65;350	100%	ON•
12	VERIZON W	751	60	1	0			60		Andrew	SBNHH-1D	71.09	88.33	80.7085	Panel	4.583	11.29	66;210	100%	ON•
12	VERIZON W	2100	60	1	0			60		Andrew	SBNHH-1D	71.09	88.33	80.7085	Panel	4.583	14.6	62;210	100%	ON•
13	VERIZON W	850	80	1	0			80		Andrew	SBNHH-1D	69.72	89.34	80.7085	Panel	4.583	11.47	61;210	100%	ON•
13	VERIZON W	1900	60	1	0			60		Andrew	SBNHH-1D	69.72	89.34	80.7085	Panel	4.583	14.65	65;210	100%	ON•
14	UNKNOWN	1900	60	1	0			60		Generic	4 Ft./65 De	73.84	92.93	99.7	Panel	4.6	15.43	65;0	100%	ON•
15	UNKNOWN	1900	60	1	0			60		Generic	4 Ft./65 De	73.68	88.44	99.7	Panel	4.6	15.43	65;120	100%	ON•
16	UNKNOWN	1900	60	1	0			60		Generic	4 Ft./65 De	69.46	90.95	99.7	Panel	4.6	15.43	65;240	100%	ON•
17	UNKNOWN	450	50.46613	1	0			50.46613		Generic	450 MHz/5	71.84	94.34	68.646	Omni	4.708	2.97	360;0	100%	ON•

StartSymbolData

Date: **October 17, 2017**

Marianne Dunst  
Crown Castle  
3530 Toringdon Way  
Charlotte, NC 28277

**JACOBS**  
Jacobs Engineering Group, Inc.  
5449 Bells Ferry Road  
Acworth, GA 30102  
770-701-2500

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **AT&T Mobility Co-Locate**  
**Carrier Site Number:** CTL01105  
**Carrier Site Name:** Willington - River Rd.

**Crown Castle Designation:** **Crown Castle BU Number:** 841301  
**Crown Castle Site Name:** WILLINGTON-RIVER RD  
**Crown Castle JDE Job Number:** 466807  
**Crown Castle Work Order Number:** 1475387  
**Crown Castle Application Number:** 411989 Rev. 2

**Engineering Firm Designation:** **Jacobs Engineering Group Inc. Project Number:** 1475387

**Site Data:** **426 RIVER ROAD, WILLINGTON, Tolland County, CT**  
**Latitude 41° 53' 26.72", Longitude -72° 17' 21.77"**  
**110 Foot - Monopole Tower**

Dear Marianne Dunst,

Jacobs Engineering Group Inc. 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 1095289, in accordance with application 411989, revision 2.

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 2016 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 B and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Jacobs Engineering Group Inc. 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:



Donitha F. Chiu  
Structural Engineer



Reviewed by:

Matthew E. Watkins, P.E., LEED<sup>AP</sup>  
Project Engineer

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## 1) INTRODUCTION

This tower is a 110 ft Monopole tower mapped by ADP Structural & Welding in May of 2011. The original design standard and wind speed are unknown. The tower has been modified per reinforcement drawings prepared by GPD, in June of 2012. Modifications consist of addition of flat plate reinforcement and base plate stiffeners. The tower was later reinforced per reinforcement drawings prepared by AeroSolutions, in January of 2015. Modifications consist of additional anchor rods and shaft reinforcement.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures 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 B.

**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
110.0	113.0	3	ericsson	RRUS 32	1 2	3/8 3/4	-
		3	ericsson	RRUS 32 B2			
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7020.00			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

**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
110.0	113.0	4	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe	-	-	2
		3	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe	12 1 2	7/8 3/8 3/4	1
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	ericsson	RRUS 11			
		6	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
100.0	110.0	1	tower mounts	Platform Mount [LP 712-1]			
	102.0	2	dapa	48212S w/ Mount Pipe			
	100.0	1	tower mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
83.0	83.0	2	alcatel lucent	B13 RRH4X30-4R	2	1-5/8	1
		2	alcatel lucent	B66A RRH4X45			
		2	alcatel lucent	RRH2X60-PCS			
		4	andrew	SBNHH-1D65A w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	tower mounts	T-Arm Mount [TA 702-1]			
69.0	74.0	1	decibel	DB810M-XC	3	1/2	1
	72.0	1	dapa	48212S w/ Mount Pipe			
	71.0	1	decibel	DB201-F			
	69.0	1	tower mounts	Side Arm Mount [SO 201-1]			

Notes:

- 1) Existing Equipment
- 2) Equipment to be Removed; Not Considered in this Analysis

**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)
Unknown						

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI	4710168	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI	4710170	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ADP Structural & Welding	5113552	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD	4945191	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	AeroSolutions	5537030	CCISITES
4-POST MODIFICATION INSPECTION	FDH Velocitel Engineering Innovation	5822398	CCISITES
4-POST MODIFICATION INSPECTION	FDH Velocitel Engineering Innovation	5864402	CCISITES
4-STRUCTURAL ANALYSIS REPORT	AeroSolutions	5729966	CCISITES

### 3.1) Analysis Method

tnxTower (version 7.0.7.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is 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) Material grades were not provided at the time of analysis. The following were assumed in this analysis:

Component	Grade
Pole Shaft	A572 Gr. 65
Anchor Rod	A615 Gr. 75
Base Plate	A572-60
Concrete Strength	F'c = 3,000 psi
Foundation Steel Reinforcement	Fy = 60 ksi

- 5) The existing reinforcement was installed per the referenced documents.
- 6) Foundation pad steel reinforcement was not provided at time of analysis. Minimum steel reinforcement was assumed in this analysis. No. 8 vertical rebar, No. 3 ties and a clear cover of 3 inches were assumed in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Jacobs Engineering Group Inc. should be notified to determine the effect on the structural integrity of the tower.

## 4) ANALYSIS RESULTS

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

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP13.901x13.051x0.1875	Pole	22.6%	Pass
105 - 100	Pole	TP14.751x13.901x0.1875	Pole	34.6%	Pass
100 - 95	Pole	TP15.941x14.751x0.1875	Pole	49.3%	Pass
95 - 90	Pole	TP16.114x15.226x0.25	Pole	48.0%	Pass
90 - 85	Pole	TP17.002x16.114x0.25	Pole	54.9%	Pass
85 - 80	Pole	TP17.89x17.002x0.25	Pole	62.4%	Pass
80 - 78.75	Pole	TP18.112x17.89x0.25	Pole	64.0%	Pass
78.75 - 78.5	Pole + Reinf.	TP18.156x18.112x0.55	Reinf. 6 Tension Rupture	54.5%	Pass
78.5 - 73.5	Pole + Reinf.	TP19.044x18.156x0.5375	Reinf. 6 Tension Rupture	61.1%	Pass
73.5 - 68.5	Pole + Reinf.	TP19.932x19.044x0.5125	Reinf. 6 Tension Rupture	67.2%	Pass
68.5 - 64.25	Pole + Reinf.	TP20.686x19.932x0.5	Reinf. 6 Tension Rupture	72.0%	Pass
64.25 - 64	Pole + Reinf.	TP20.731x20.686x0.775	Reinf. 1 Tension Rupture	55.5%	Pass
64 - 59	Pole + Reinf.	TP21.619x20.731x0.75	Reinf. 1 Tension Rupture	59.9%	Pass
59 - 56.5	Pole + Reinf.	TP22.063x21.619x0.725	Reinf. 1 Tension Rupture	62.0%	Pass
56.5 - 56.25	Pole + Reinf.	TP22.107x22.063x0.975	Reinf. 1 Tension Rupture	48.7%	Pass
56.25 - 51.25	Pole + Reinf.	TP22.995x22.107x0.925	Reinf. 1 Tension Rupture	51.9%	Pass



Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
51.25 - 49.5	Pole + Reinf.	TP24.016x22.995x0.9125	Reinf. 1 Tension Rupture	53.0%	Pass
49.5 - 44.5	Pole + Reinf.	TP23.709x22.806x0.725	Reinf. 5 Tension Rupture	55.0%	Pass
44.5 - 39.5	Pole + Reinf.	TP24.613x23.709x0.7125	Reinf. 5 Tension Rupture	57.2%	Pass
39.5 - 37.25	Pole + Reinf.	TP25.019x24.613x0.7	Reinf. 5 Tension Rupture	58.1%	Pass
37.25 - 37	Pole + Reinf.	TP25.065x25.019x0.7	Reinf. 2 Tension Rupture	56.8%	Pass
37 - 34.25	Pole + Reinf.	TP25.562x25.065x0.6875	Reinf. 2 Tension Rupture	57.9%	Pass
34.25 - 34	Pole + Reinf.	TP25.607x25.562x0.5375	Reinf. 2 Tension Rupture	63.0%	Pass
34 - 33.75	Pole + Reinf.	TP25.652x25.607x0.5375	Reinf. 2 Tension Rupture	63.1%	Pass
33.75 - 33.5	Pole + Reinf.	TP25.697x25.652x0.725	Reinf. 4 Tension Rupture	53.8%	Pass
33.5 - 28.5	Pole + Reinf.	TP26.601x25.697x0.7	Reinf. 4 Tension Rupture	55.4%	Pass
28.5 - 23.5	Pole + Reinf.	TP27.504x26.601x0.6875	Reinf. 4 Tension Rupture	56.8%	Pass
23.5 - 18.5	Pole + Reinf.	TP28.408x27.504x0.675	Reinf. 4 Tension Rupture	58.2%	Pass
18.5 - 13.5	Pole + Reinf.	TP29.311x28.408x0.6625	Reinf. 4 Tension Rupture	59.4%	Pass
13.5 - 8.5	Pole + Reinf.	TP30.215x29.311x0.6375	Reinf. 4 Tension Rupture	60.4%	Pass
8.5 - 3.5	Pole + Reinf.	TP31.119x30.215x0.6375	Reinf. 4 Tension Rupture	61.4%	Pass
3.5 - 0	Pole + Reinf.	TP31.751x31.119x0.625	Reinf. 4 Tension Rupture	62.0%	Pass
				Summary	
			Pole	64.0%	Pass
			Reinforcement	72.0%	Pass
			Overall	72.0%	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	40.4	Pass
1	Anchor Rod Sleeve Pipe	0	43.8	Pass
1	Base Plate	0	46.2	Pass
1	Base Foundation Structural	0	28.9	Pass
1	Base Foundation Soil Interaction	0	36.7	Pass

<b>Structure Rating (max from all components) =</b>	<b>72.0%</b>
---	--------------

Notes:

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

#### 4.1) Recommendations

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

# 426 RIVER RD

**Location** 426 RIVER RD

**Mblu** 34 / 010-00 /

**Acct#** 00242700

**Owner** WILLINGTON FIRE DEPT INC

**Assessment** \$285,980

**Appraisal** \$408,520

**PID** 4891

**Building Count** 1

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2013	\$298,840	\$109,680	\$408,520

Assessment			
Valuation Year	Improvements	Land	Total
2013	\$209,200	\$76,780	\$285,980

## Owner of Record

**Owner** WILLINGTON FIRE DEPT INC  
**Co-Owner**  
**Address** P O BOX 161  
WILLINGTON, CT 06279

**Sale Price** \$0  
**Certificate** 1  
**Book & Page** 80/355  
**Sale Date** 06/25/1980

## Building Information

### Building 1 : Section 1

**Year Built:** 1985  
**Living Area:** 4,266  
**Replacement Cost:** \$344,471  
**Building Percent Good:** 80  
**Replacement Cost Less Depreciation:** \$275,580

Building Attributes	
Field	Description
STYLE	Fire Station
MODEL	Commercial
Grade	C-
Stories:	1
Occupancy	1.00
Exterior Wall 1	Typical

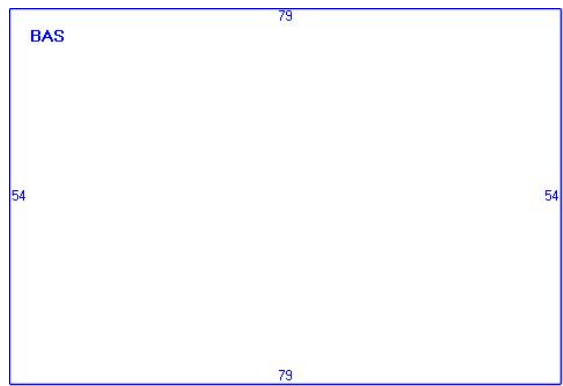
## Building Photo



(<http://images.vgsi.com/photos/WillingtonCTPhotos/0000018/>)

## Building Layout

Exterior Wall 2	
Roof Structure	Typical
Roof Cover	Typical
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Typical
Interior Floor 2	
Heating Fuel	Typical
Heating Type	Floor Furnace
AC Type	Unit/AC
Bldg Use	MUN FIRE
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	None
Frame Type	Fireprf Steel
Baths/Plumbing	Average
Ceiling/Wall	-DESCRIPTION-
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	



Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
BAS	First Floor	4,266	4,266
		4,266	4,266

### Extra Features

Extra Features		<u>Legend</u>
No Data for Extra Features		

### Land

#### Land Use

<b>Use Code</b>	9032
<b>Description</b>	MUN FIRE
<b>Zone</b>	R80
<b>Neighborhood</b>	301
<b>Alt Land Appr Category</b>	No

#### Land Line Valuation

<b>Size (Acres)</b>	13.16
<b>Frontage</b>	
<b>Depth</b>	
<b>Assessed Value</b>	\$76,780
<b>Appraised Value</b>	\$109,680

### Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #

LT1	LIGHTS-IN W/PL			1.00 UNITS	\$480	1
LT5	MERC VAP/FLU			1.00 UNITS	\$770	1
PAV1	PAVING-ASPHALT			15000.00 S.F.	\$21,000	1
SHD1	SHED FRAME			168.00 S.F.	\$1,010	1

**Valuation History**

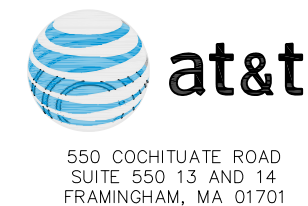
<b>Appraisal</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2016	\$298,840	\$109,680	\$408,520

<b>Assessment</b>			
<b>Valuation Year</b>	<b>Improvements</b>	<b>Land</b>	<b>Total</b>
2016	\$209,200	\$76,780	\$285,980

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**PROJECT:** LTE 2C/3C  
**SITE NUMBER:** CTL01105  
**FA NUMBER:** 10035261  
**PTN NUMBER:** 2051A0D6QH  
**PACE NUMBER:** MRCTB025392, MRCTB025402  
**CROWN BU#:** 841301  
**SITE NAME:** WILLINGTON - RIVER ROAD  
**SITE ADDRESS:** 426 RIVER ROAD  
 WILLINGTON, CT 06279



**PROJECT INFORMATION**

**SITE NAME:** WILLINGTON - RIVER ROAD  
**SITE NUMBER:** CTL01105  
**SITE ADDRESS:** 426 RIVER ROAD  
 WILLINGTON, CT 06279  
**FA NUMBER:** 10035261  
**PTN NUMBER:** 2051A0D6QH  
**PACE NUMBER:** MRCTB025392, MRCTB025402  
**USID NUMBER:** 59382  
**CROWN BU#:** 841301  
**APPLICANT:** AT&T WIRELESS  
 550 COCHITUATE ROAD SUITE 550 13 AND 14  
 FRAMINGHAM, MA 01701  
**TOWER OWNER:** CROWN CASTLE INTERNATIONAL  
 12 GILL STREET, SUITE 5800  
 WOBURN, MA 01801  
**JURISDICTION:** TOWN OF WILLINGTON  
**COUNTY:** TOLLAND  
**SITE COORDINATES FROM (RFDS):**  
**LATITUDE:** 41.8907419°  
**LONGITUDE:** -72.2893881°  
**GROUND ELEV.:** 615'  
**PROPOSED USE:** TELECOMMUNICATIONS FACILITY  
**AT&T RF MANAGER:** DEEPAK RATHORE  
**PHONE:** (860) 965-3068  
**EMAIL:** dr701e@att.com

**SCOPE OF WORK**

LTE 850 WILL BE 2C/3C AT THE SITE WITH BRONZE CONFIGURATION. PROPOSED 2C/3C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1833300, VERSION 1.00 LAST UPDATED 09/26/17.

- (3) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS
- (6) NEW RRUS-32
- (1) NEW RAYCAP UNIT
- (1) FIBER CABLE AND (2) DC POWER CABLES
- UPGRADE DUL W/ 5216 AND ADD XMU

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

**APPLICABLE BUILDING CODES AND STANDARDS**

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

**BUILDING CODE:** 2012 INTERNATIONAL BUILDING CODE  
 2016 CONNECTICUT STATE BUILDING CODE SUPPLEMENT

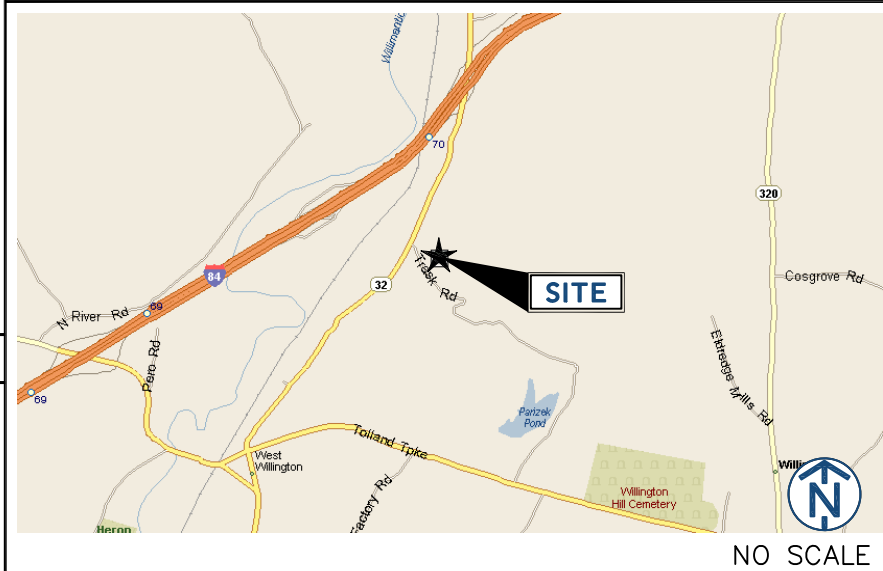
**ELECTRICAL CODE:** 2014 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

REV	DATE	DESCRIPTION	BY
0	09/28/17	90% REVIEW	EB
1	11/03/17	FOR PERMIT	EB

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

**SITE LOCATION MAP**



**DRAWING INDEX**

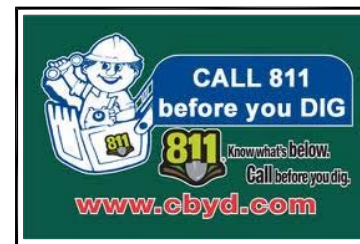
TITLE	DESCRIPTION
T1	TITLE SHEET
SP1	NOTES AND SPECIFICATIONS
SP2	NOTES AND SPECIFICATIONS
A1	COMPOUND PLAN
A2	EQUIPMENT PLAN
A3	ELEVATIONS
A4	ANTENNA PLANS
A5	EQUIPMENT DETAILS
A6	ANTENNA & CABLE CONFIGURATION
A7	CABLE NOTES AND COLOR CODING
A8	GROUNDING DETAILS

**PROJECT CONSULTANTS**

**PROJECT MANAGER:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102  
 NORTH BILLERICA, MA 01862  
**CONTACT:** EDWARD WEISSMAN (917) 528-1857  
**EMAIL:** Edward.Weissman@smartlinkllc.com  
**SITE ACQUISITION:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102  
 NORTH BILLERICA, MA 01862  
**CONTACT:** SHARON KEEFE (978) 930-3918  
**EMAIL:** Sharon.Keefe@smartlinkllc.com  
**ENGINEER/ARCHITECT:** FULLERTON ENGINEERING  
 1100 E. WOODFIELD ROAD, SUITE 500  
 SCHAUMBURG, IL 60173  
**CONTACT:** MILEN DIMITROV (847) 908-8439  
**EMAIL:** MDimitrov@FullertonEngineering.com  
**CONSTRUCTION:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102  
 NORTH BILLERICA, MA 01862  
**CONTACT:** MARK DONNELLY (617) 515-2080  
**EMAIL:** mark.donnely@smartlinkllc.com

**DIRECTIONS**

SCAN QR CODE FOR LINK TO SITE LOCATION MAP



NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

**SITE NAME**  
WILLINGTON - RIVER ROAD

**SITE NUMBER:**  
CTL01105

**SITE ADDRESS**  
426 RIVER ROAD  
WILLINGTON, CT 06279

**SHEET NAME**  
TITLE SHEET

**SHEET NUMBER**  
T1

THESE DRAWINGS ARE THE PROPERTY OF FULLERTON ENGINEERING CONSULTANTS, INC. IT IS FOR THE EXCLUSIVE USE OF THIS PROJECT. ANY RE-USE OF THIS DRAWING WITHOUT THE EXPRESSED WRITTEN CONSENT OF FULLERTON ENGINEERING CONSULTANTS, INC. IS PROHIBITED.

**GENERAL CONSTRUCTION**

- 1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR/CM – SMARTLINK  
OWNER – AT&T WIRELESS
- 2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
- 3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
- 4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
- 5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
- 6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- 7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
- 8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
- 10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
- 11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
- 12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
- 13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
- 14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- 15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
- 16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- 17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
- 19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

- 20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
- 21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
- 22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
- 23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
- 24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
- 25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
- 26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- 27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.
- 28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
- 29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
- 30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
- 31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
- 32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
- 33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
- 34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
- 35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
- 36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
- 37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
- 38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- 39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

**ANTENNA MOUNTING**

- 40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL

CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.

- 41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
- 42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
- 43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
- 44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
- 45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
- 46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
- 47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
- 48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
- 49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
- 50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

**TORQUE REQUIREMENTS**

- 51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
- 52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.  
A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.  
B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

**FIBER & POWER CABLE MOUNTING**

- 53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
- 54. THE TYPE TC-ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC-ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES. A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
- 55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC-ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

**COAXIAL CABLE NOTES**

- 62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
- 63. CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
- 64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
- 65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN

TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".

- 66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" OC.
- 67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
- 68. CONTRACTOR SHALL GROUND ALL EQUIPMENT INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
- 69. CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- 70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

**GENERAL CABLE AND EQUIPMENT NOTES**

- 71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- 72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
- 73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
- 74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
- 75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:  
A. TEMPERATURE SHALL BE ABOVE 50° F.  
B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.  
C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.  
D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
- 76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.  
A. GROUNDING AT THE ANTENNA LEVEL.  
B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.  
C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.  
D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.  
E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
- 77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.



550 COCHITUATE ROAD  
SUITE 550 13 AND 14  
FRAMINGHAM, MA 01701



1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



1100 E. WOODFIELD ROAD, SUITE 500  
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SITE NAME  
**WILLINGTON - RIVER ROAD**

SITE NUMBER:  
**CTL01105**

SITE ADDRESS  
**426 RIVER ROAD  
WILLINGTON, CT 06279**

SHEET NAME  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER  
**SP1**

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**NOTICE**

**Beyond This Point** you are entering a controlled area where RF emissions *may exceed* the FCC General Population Exposure Limits.

Follow all posted signs and site guidelines for working in a RF environment.

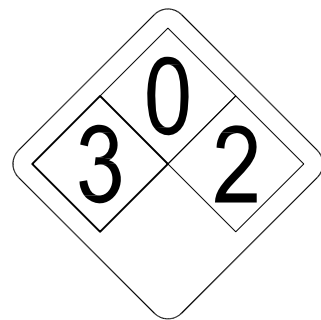
Ref: 47CFR 1.1307(b)

**CAUTION**

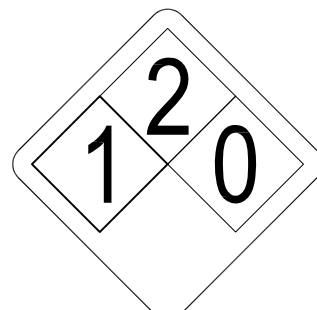
**Beyond This Point** you are entering a controlled area where RF emissions *may exceed* the FCC Occupational Exposure Limits.

Obey all posted signs and site guidelines for working in a RF environment.

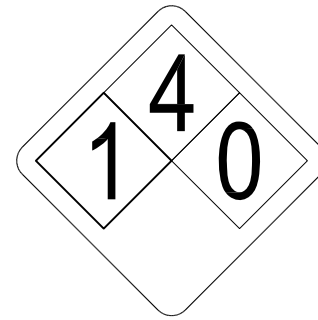
Ref: 47CFR 1.1307(b)



ALERTING SIGN  
(FOR CELL SITE BATTERIES)



ALERTING SIGN  
(FOR DIESEL FUEL)



ALERTING SIGN  
(FOR PROPANE)

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ALERTING SIGNS

**WARNING!**

DANGER DO NOT TOUCH TOWER!  
SERIOUS "RF" BURN HAZARD!

MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES

FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN A RADIO FREQUENCY ENVIRONMENT COULD RESULT IN SERIOUS INJURY. CONTACT CURRENT MAY EXCEED LIMITS PRESCRIBED IN ANSI, IEEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.

PROPERTY OF AT&T

**AUTHORIZED PERSONNEL ONLY**

IN CASE OF EMERGENCY, OR PRIOR TO PERFORMING MAINTENANCE ON THIS SITE, CALL 800-638-2822 AND REFERENCE CELL SITE NUMBER \_\_\_\_\_

ALERTING SIGN

INFO SIGN #4

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
<b>TOWERS</b>							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%: NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND; ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
<b>TOWERS</b>							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
<b>CHURCH STEEPLES</b>	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
<b>WATER STATIONS</b>	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

STAY BACK 3 FEET FROM ANTENNA

**INFORMATION**

AT&T operates telecommunications antennas at this location. Remain at least 3 feet away from any antenna and obey all posted signs.

Contact the owner(s) of the antenna(s) before working closer than 3 feet from the antenna.

Contact AT&T at \_\_\_\_\_ prior to performing any maintenance or repairs near AT&T antennas. This is Site # \_\_\_\_\_

Contact the management office if this door/hatch/gate is found unlocked.

**INFORMACION**

En esta propiedad se ubican antenas de telecomunicaciones operadas por AT&T. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.

Comuníquese con el propietario o los propietarios de las antenas antes de trabajar o caminar a una distancia de menos de 3 pies de la antena.

Comuníquese con AT&T \_\_\_\_\_ antes de realizar cualquier mantenimiento o reparaciones cerca de la antena de AT&T.

Esta es la estación base maestra. \_\_\_\_\_

Favor comunicarse con la oficina de la administración del edificio si esta puerta o compuerta se encuentra sin candado.

**INFORMATION**

ACTIVE ANTENNAS ARE MOUNTED

ON THE OUTSIDE OF THIS BUILDING

BEHIND THIS PANEL

ON THIS STRUCTURE

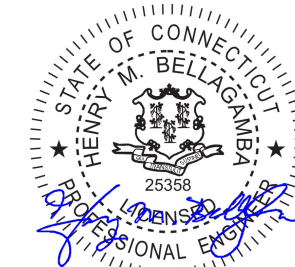
STAY BACK A MINIMUM OF 3 FEET FROM THESE ANTENNAS

Contact AT&T at \_\_\_\_\_ and follow their instructions prior to performing any maintenance or repairs closer than 3 feet from the antennas.

This is AT&T site # \_\_\_\_\_

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**CTL01105**

SITE ADDRESS  
**426 RIVER ROAD  
WILLINGTON, CT 06279**

SHEET NAME  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER  
**SP2**

INFO SIGN #1

INFO SIGN #2

INFO SIGN #3

SIGNAGE GUIDELINES CHART

NOTES FOR ROOFTOP SITES:

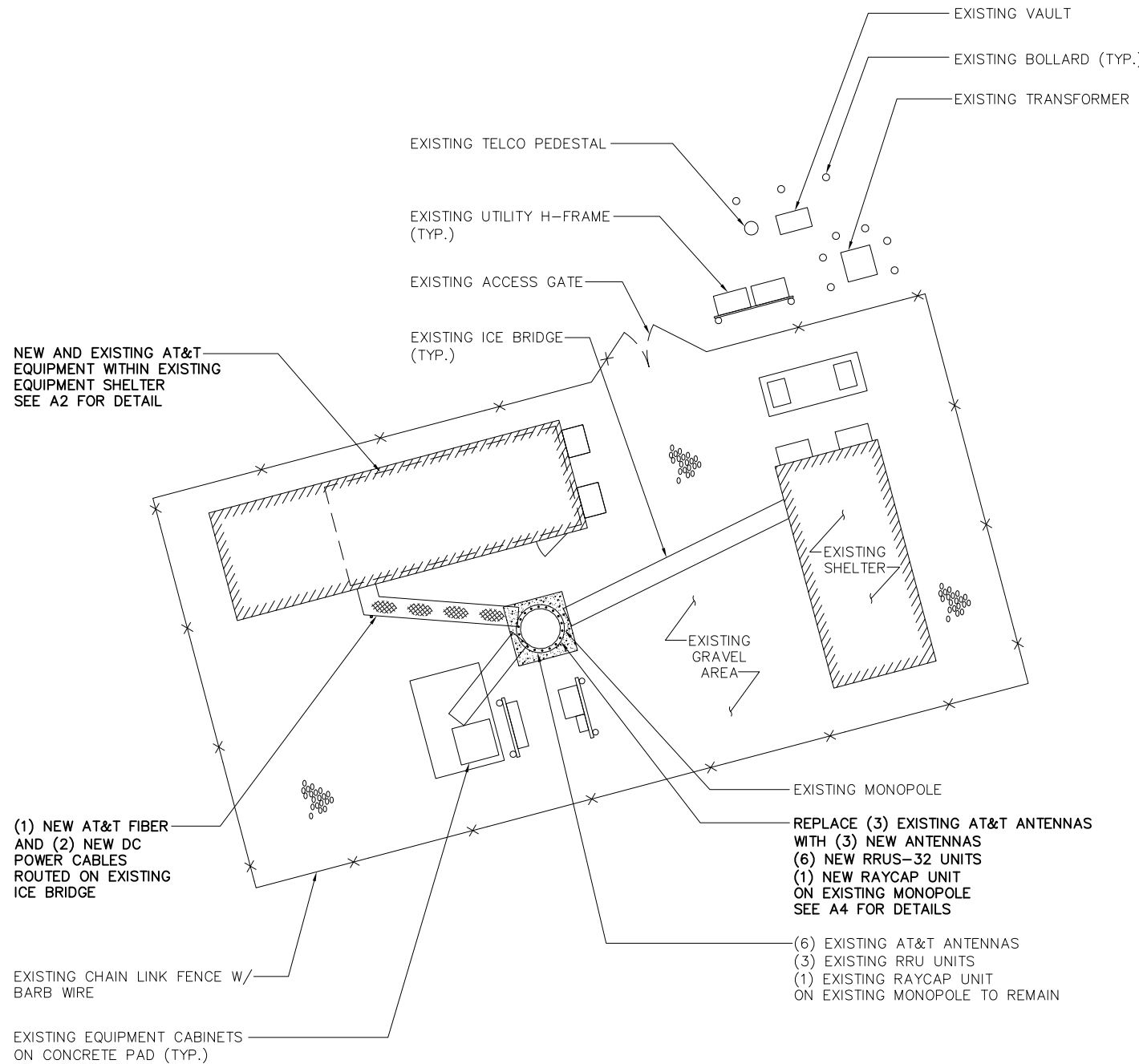
- EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
- IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
- SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

**ABBREVIATIONS**

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
CL	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERTY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

**SYMBOLS**

	REVISION
	WORK POINT
	UTILITY POLE
	COMPRESSED STONE
	BRICK
	CONCRETE
	EARTH
	GRAVEL
	MASONRY
	STEEL
	CENTERLINE
	PROPERTY LINE
	LEASE LINE
	EASEMENT LINE
	CHAIN LINK FENCE
	WOOD FENCE
	BELOW GRADE ELECTRIC
	BELOW GRADE TELEPHONE
	OVERHEAD ELECTRIC/TELEPHONE
	SECTION REFERENCE



**COMPOUND PLAN**

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



**SITE PHOTO 1** SCALE: N.T.S. 2



**SITE PHOTO 2** SCALE: N.T.S. 3



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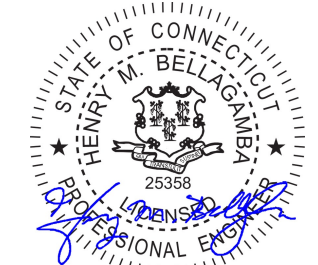
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SITE NUMBER:  
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SITE ADDRESS  
**426 RIVER ROAD  
WILLINGTON, CT 06279**

SHEET NAME  
**COMPOUND PLAN**

SHEET NUMBER  
**A1**

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SHEET NAME

**EQUIPMENT  
PLAN**

SHEET NUMBER

**A2**

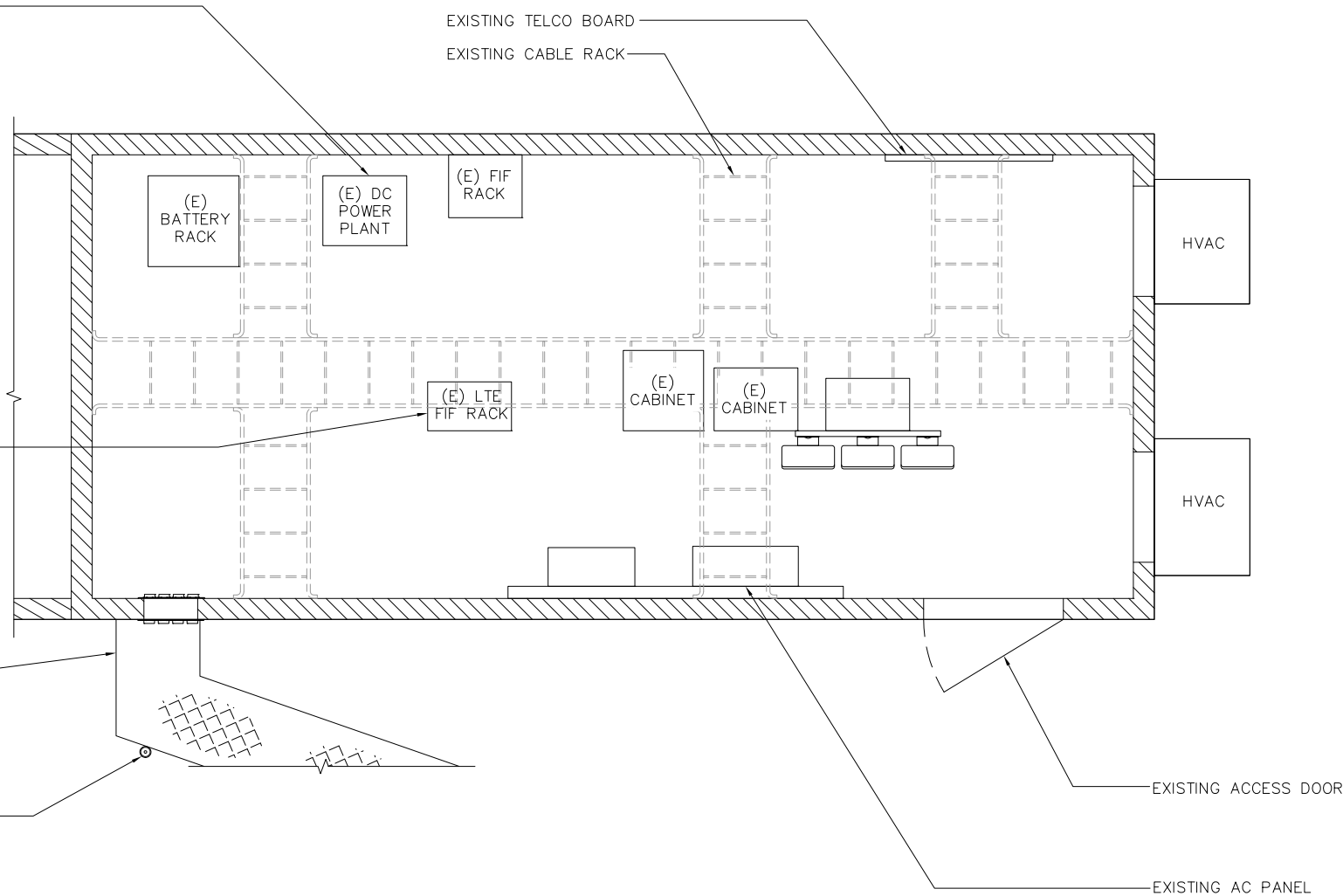
INSTALL (6) NEW 25 AMP  
BREAKERS IN EXISTING  
POWER PLANT

EXISTING TELCO BOARD  
EXISTING CABLE RACK

UPGRADE EXISTING DUL W/  
NEW 5216 AND ADD NEW XMU

EXISTING ICE BRIDGE

EXISTING GPS ANTENNA



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SHEET NAME

**ELEVATIONS**

SHEET NUMBER

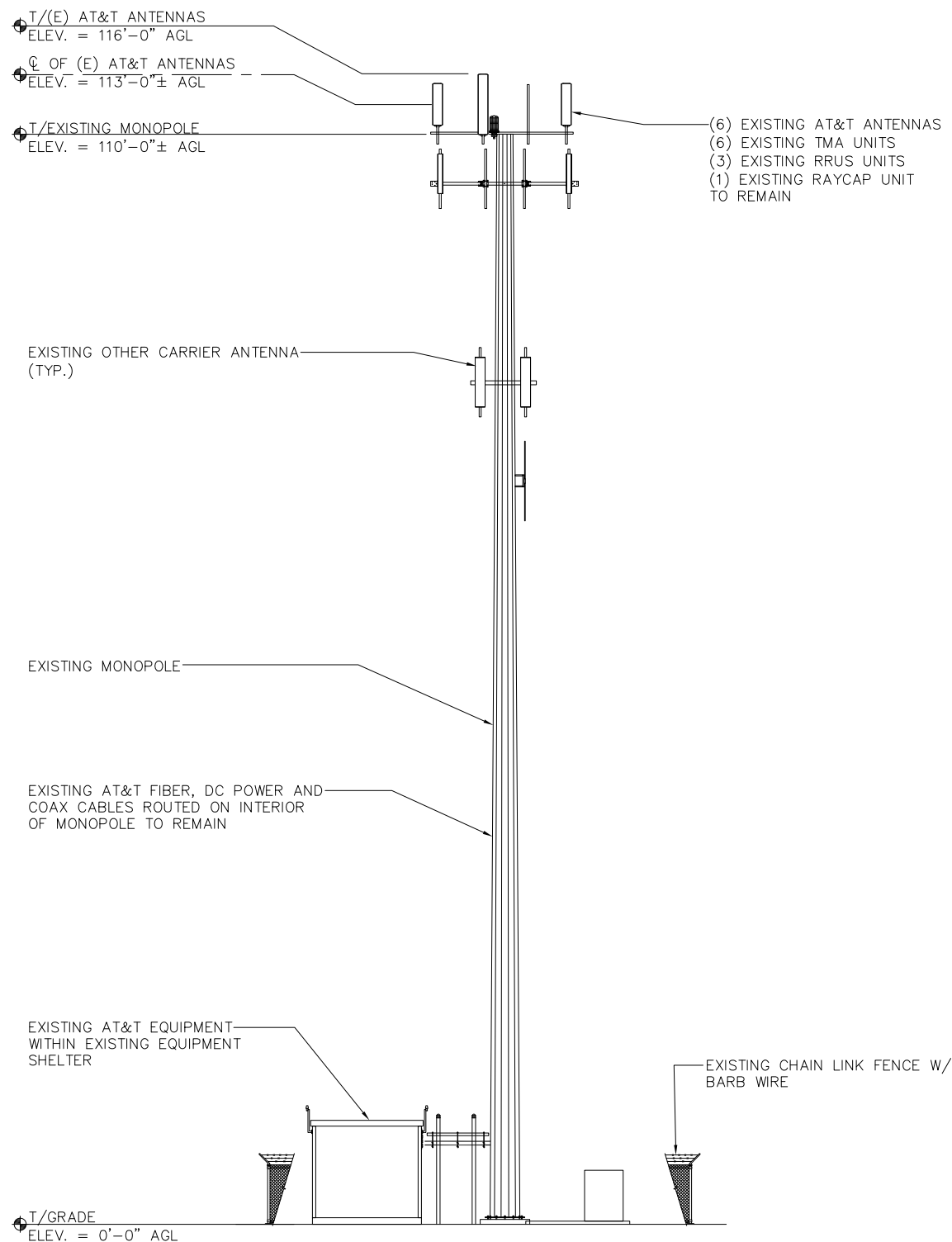
**A3**

**NOTES:**

1. CALCULATIONS FOR THE STRUCTURE AND ANTENNA MOUNTS WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CABLES NOT SHOWN FOR CLARITY

**NOTES:**

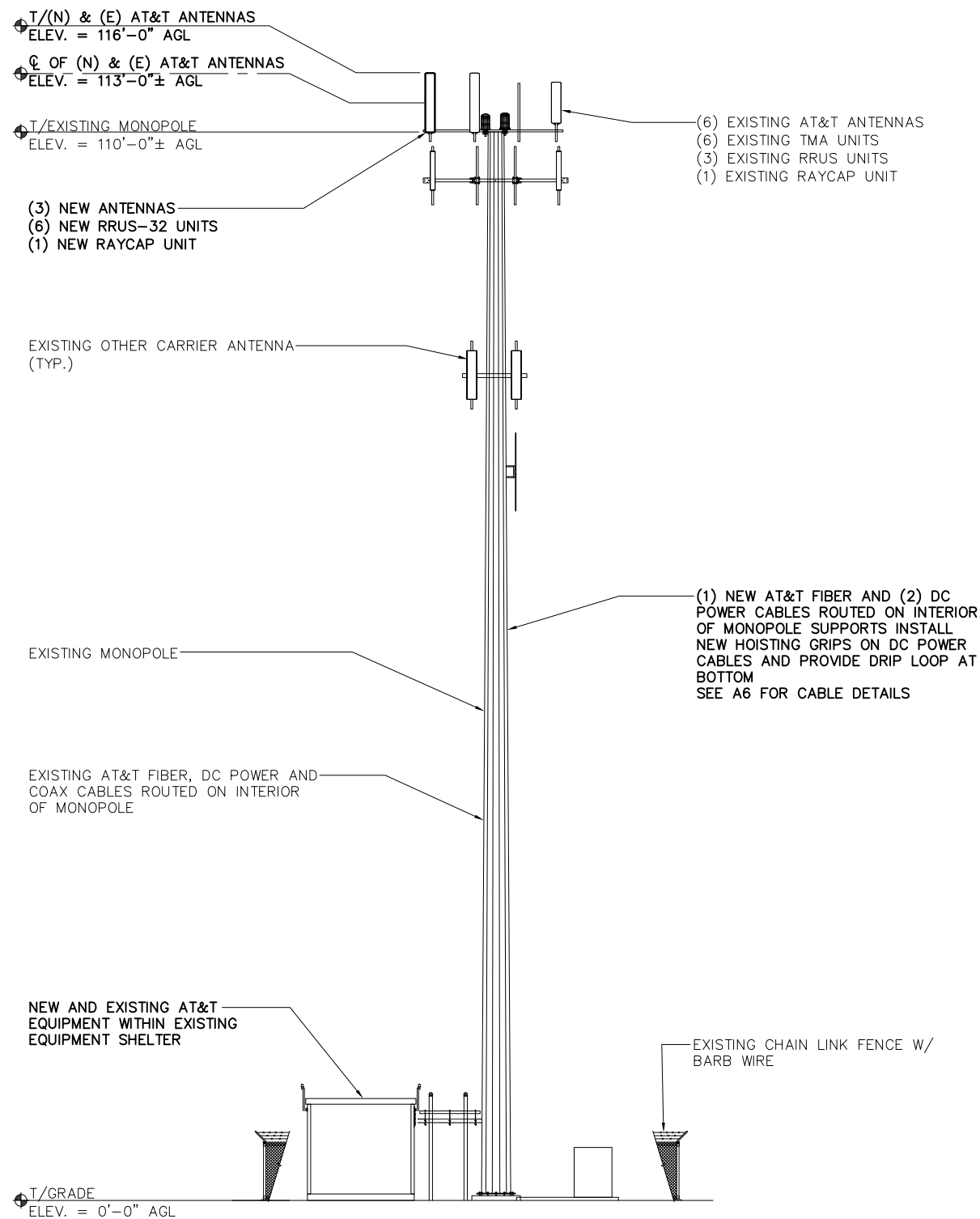
1. ALL EQUIPMENT (ANTENNAS, LINES, ETC.) TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.
2. TAPE DROP FORMS AND PHOTOGRAPHS TO BE SUBMITTED PER CCI AND AT&T CLOSEOUT REQUIREMENTS.



EXISTING ELEVATION

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

1

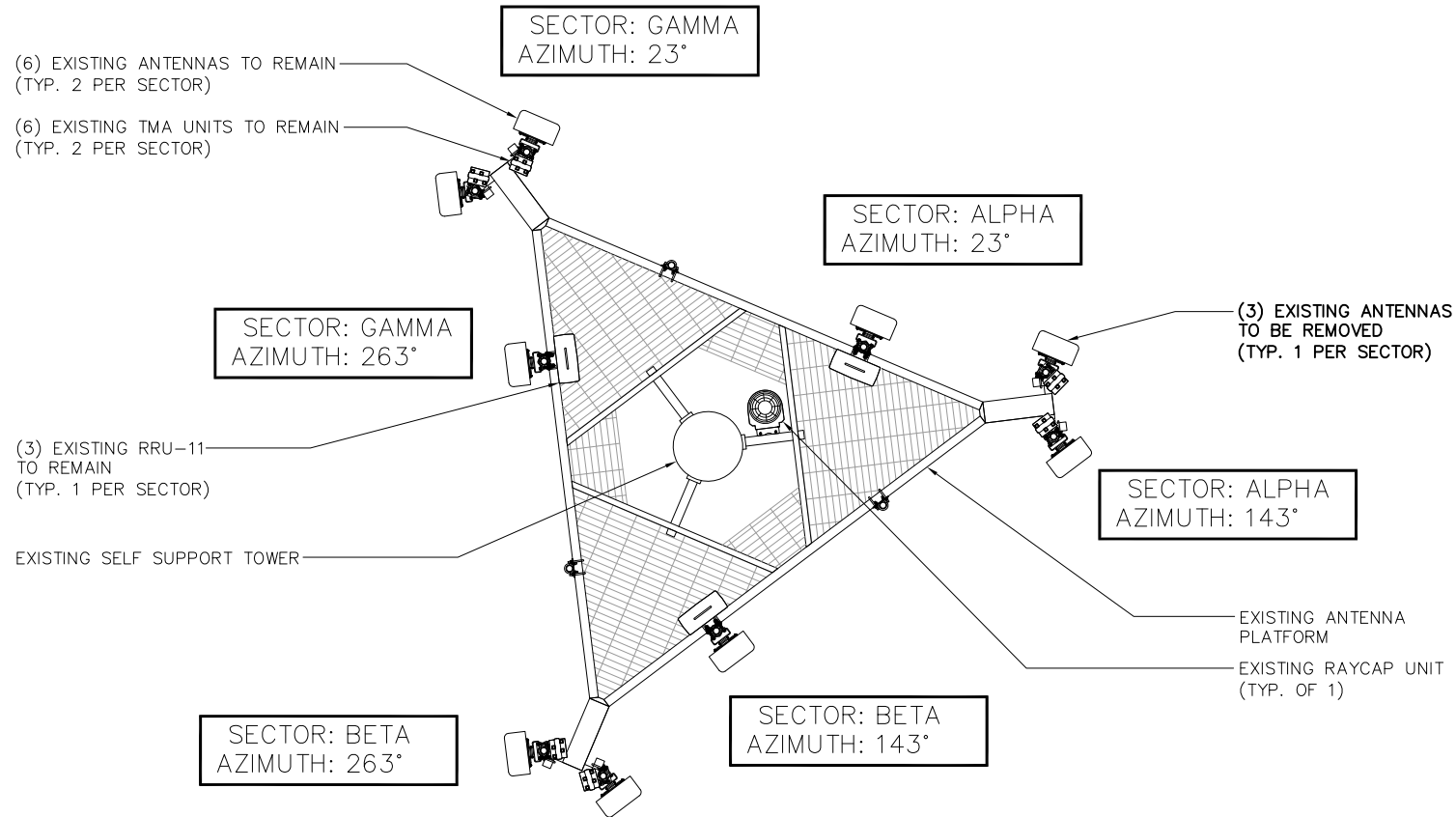


NEW ELEVATION

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

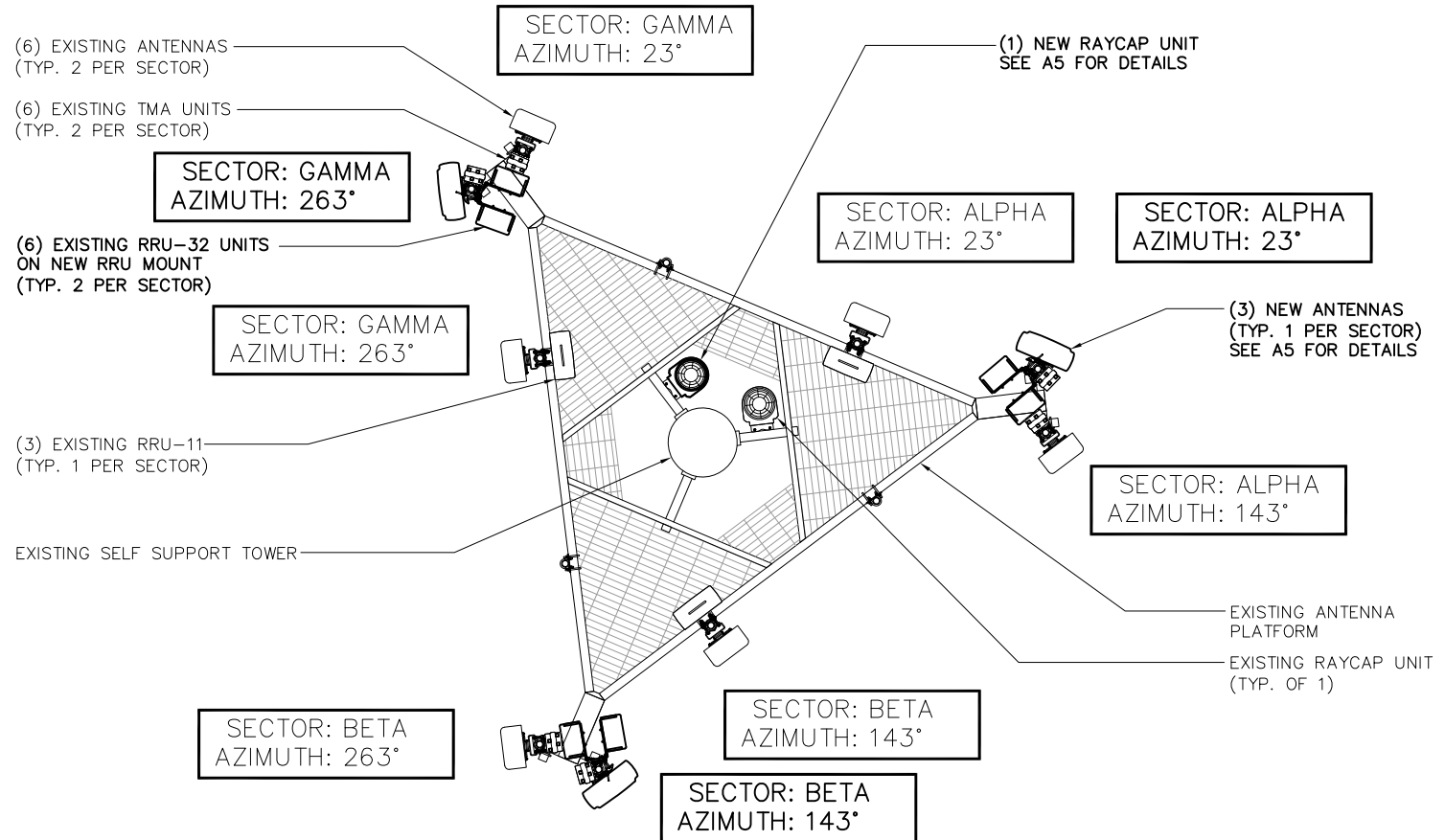
2

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EXISTING ANTENNA PLAN

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



FINAL ANTENNA PLAN

SCALE: 3/16" = 1'-0" 2

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 TEL: 847-908-8400  
 COA# PEC.0001444  
 www.FullertonEngineering.com

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SITE NAME  
**WILLINGTON - RIVER ROAD**

SITE NUMBER:  
**CTL01105**

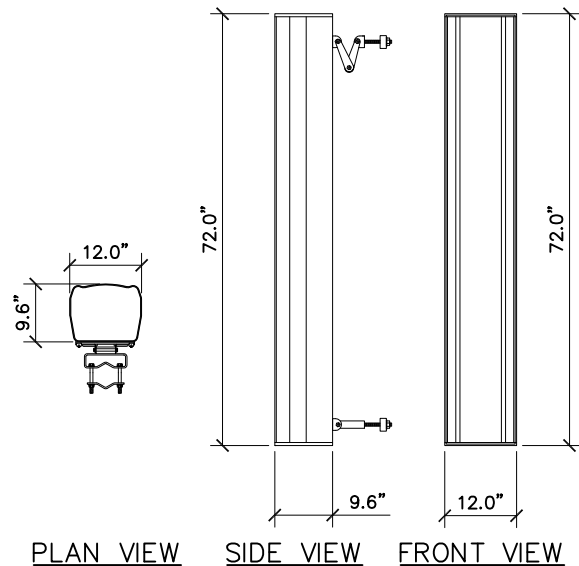
SITE ADDRESS  
**426 RIVER ROAD  
 WILLINGTON, CT 06279**

SHEET NAME  
**ANTENNA PLANS**

SHEET NUMBER  
**A4**



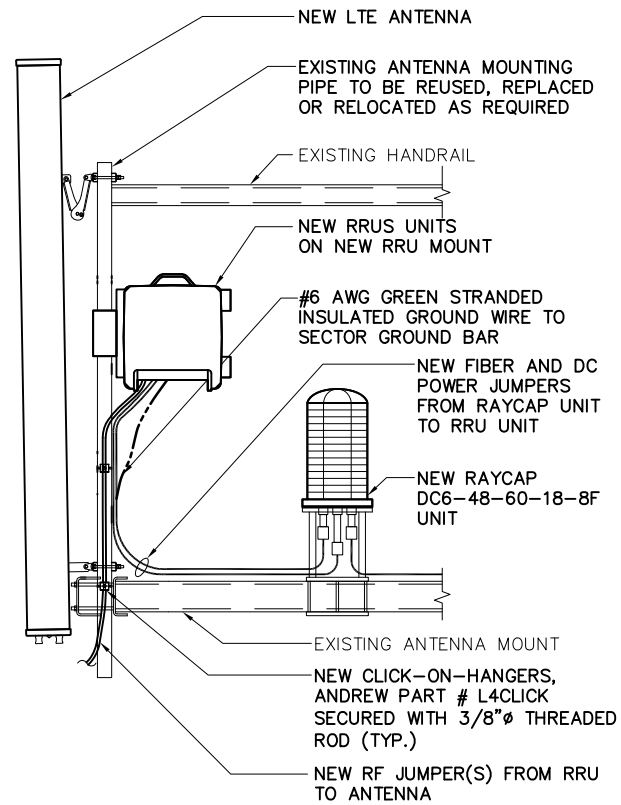
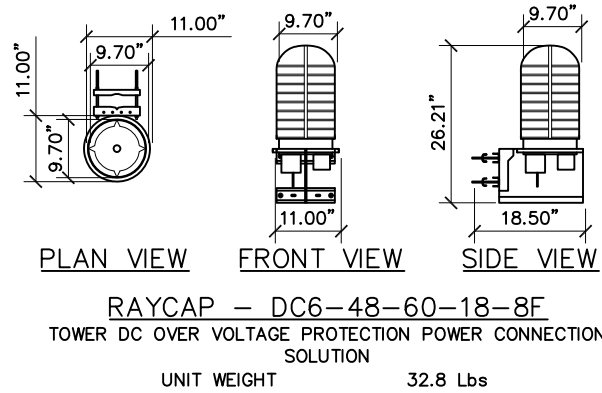
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**QUINTEL - QS66512-2**  
 MULTISERVE MULTIBAND 12 PORT ANTENNA  
 WITH QILT AND INTERNAL RET

FREQUENCY RANGE      2x698-806 MHz  
                                   2x824-894 MHz  
                                   4x1850-1990 MHz  
                                   4x1695-1780 +2110-2400 MHz

ANTENNA                            111 Lbs  
 BRACKET                            15 Lbs  
 TOTAL WEIGHT                    126 Lbs

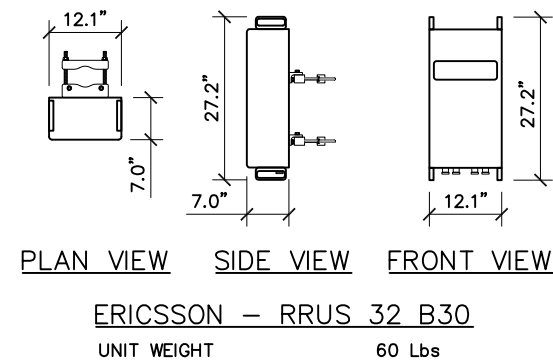


ANTENNA SPEC                    SCALE: N.T.S.      1

RAYCAP SPEC                    SCALE: N.T.S.      2

ANTENNA SCHEMATIC            SCALE: N.T.S.      3

NOT USED                            SCALE: N.T.S.      4



RRU SPEC                            SCALE: N.T.S.      5

NOT USED                            SCALE: N.T.S.      6

NOT USED                            SCALE: N.T.S.      7

NOT USED                            SCALE: N.T.S.      8



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SITE ADDRESS  
**426 RIVER ROAD  
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SHEET NAME  
**EQUIPMENT DETAILS**

SHEET NUMBER  
**A5**

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SITE NAME  
**WILLINGTON - RIVER ROAD**

SITE NUMBER:  
**CTL01105**

SITE ADDRESS  
**426 RIVER ROAD  
WILLINGTON, CT 06279**

SHEET NAME  
**ANTENNA & CABLE CONFIGURATION**

SHEET NUMBER  
**A6**

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (09/26/17)										
SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER		RAYCAP UNIT
								TYPE	LENGTH	
ALPHA	A-1	(E) UMTS ANTENNA	P65-15-XLH-RR	POWERWAVE	(1) EXISTING TMA UNIT	143°	113'-0"	7/8"φ LDF5-50A	160'-0"	(1) (E) DC6-48-60-18-8F UNIT (1) (N) DC6-48-60-18-8F UNIT
	A-2	-	-	-	-	-	-	-	-	
	A-3	(E) LTE1C ANTENNA	AM-X-CD-16-65-00T-RET	KMW	(1) RRUS-11 UNIT	23°	113'-0"	(1) EXISTING FIBER CABLE	160'-0"	
	A-4	(N) LTE2C/3C ANTENNA	QS66512-2	QUINTEL	(2) NEW RRUS-32 UNITS (1) EXISTING TMA UNIT	23°	113'-0"	(1) NEW FIBER CABLE	160'-0"	
BETA	B-1	(E) UMTS ANTENNA	P65-15-XLH-RR	POWERWAVE	(1) EXISTING TMA UNIT	263°	113'-0"	7/8"φ LDF5-50A	160'-0"	
	B-2	-	-	-	-	-	-	-	-	
	B-3	(E) LTE1C ANTENNA	AM-X-CD-16-65-00T-RET	KMW	(1) RRUS-11 UNIT	143°	113'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	B-4	(N) LTE2C/3C ANTENNA	QS66512-2	QUINTEL	(2) NEW RRUS-32 UNITS (1) EXISTING TMA UNIT	143°	113'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH		
GAMMA	C-1	(E) UMTS ANTENNA	P65-15-XLH-RR	POWERWAVE	(1) EXISTING TMA UNIT	23°	113'-0"	7/8"φ LDF5-50A	160'-0"	
	C-2	-	-	-	-	-	-	-	-	
	C-3	(E) LTE1C ANTENNA	AM-X-CD-16-65-00T-RET	KMW	(1) RRUS-11 UNIT	263°	113'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	C-4	(N) LTE2C/3C ANTENNA	QS66512-2	QUINTEL	(2) NEW RRUS-32 UNITS (1) EXISTING TMA UNIT	263°	113'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH		

LEGEND  
(N) - NEW  
(E) - EXISTING

- CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
- THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
- VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
- UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
- ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
- CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
- SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
- CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
- CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

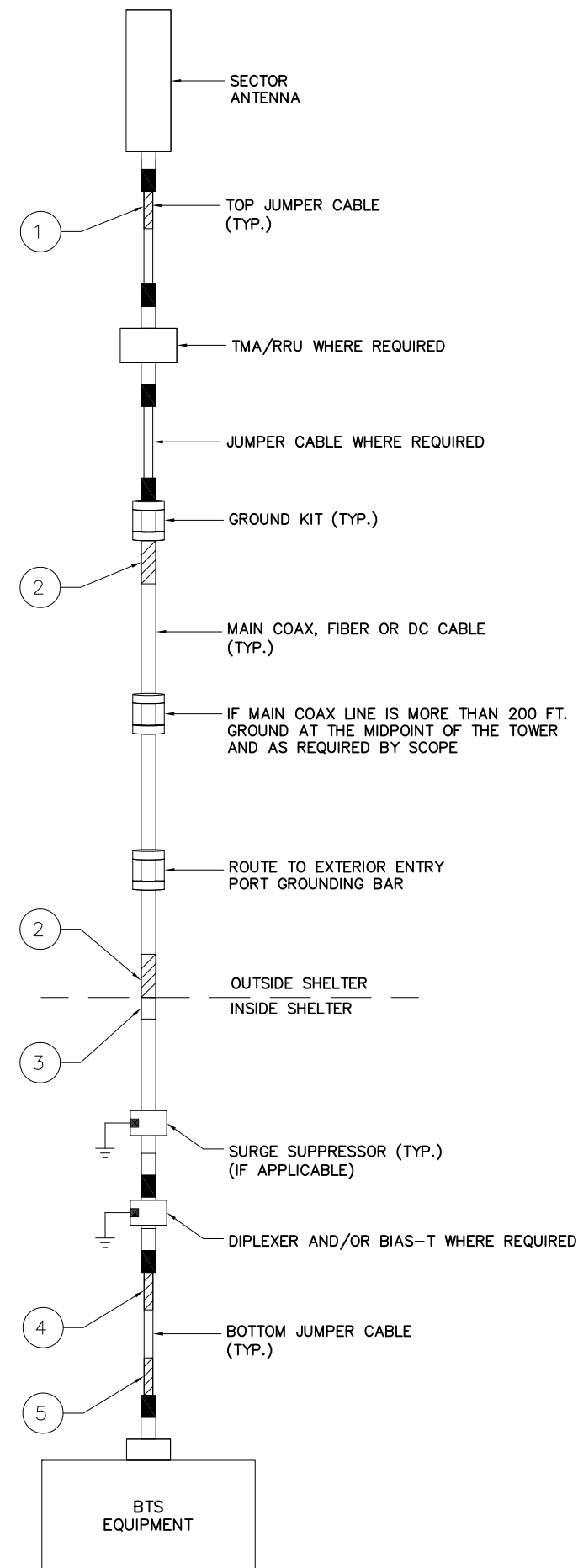
CABLE MARKING DIAGRAM

SCALE: N.T.S. 2

- THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
- THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
- USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
- WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
- ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. 3



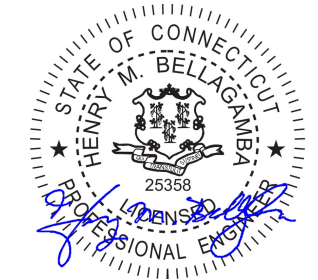
CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. 4



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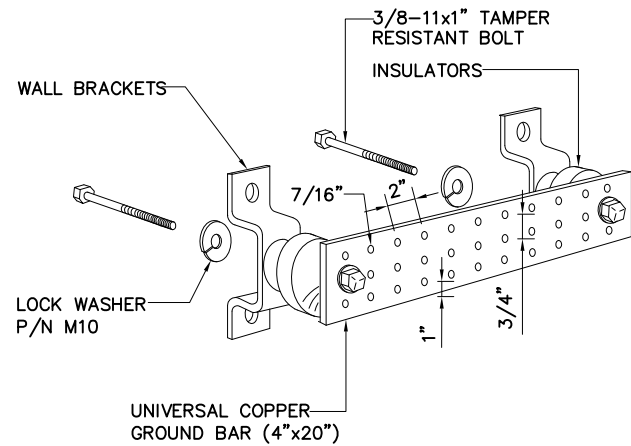
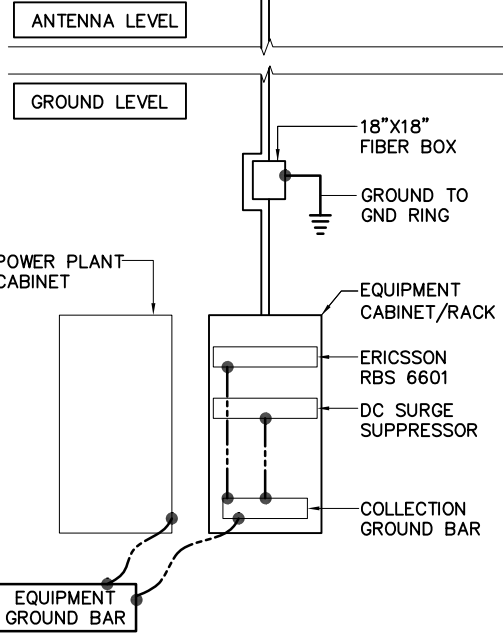
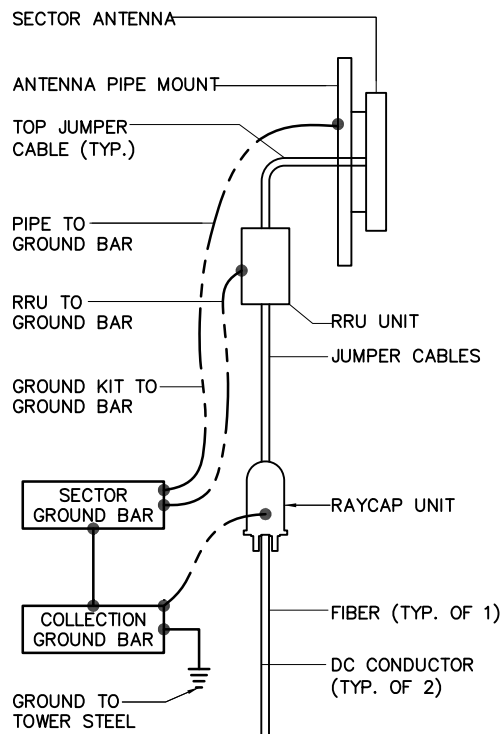
SITE NUMBER:  
**CTL01105**

SITE ADDRESS  
**426 RIVER ROAD  
WILLINGTON, CT 06279**

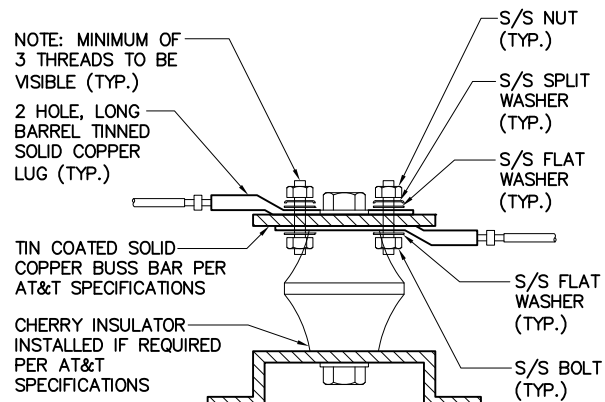
SHEET NAME  
**CABLE NOTES AND COLOR CODING**

SHEET NUMBER  
**A7**

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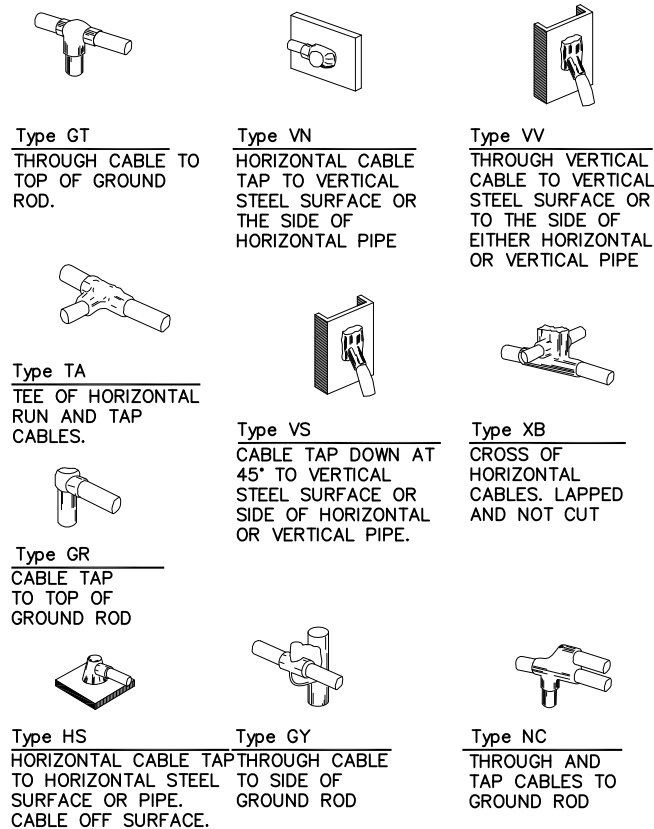


GROUND BAR DETAIL SCALE: N.T.S. 2

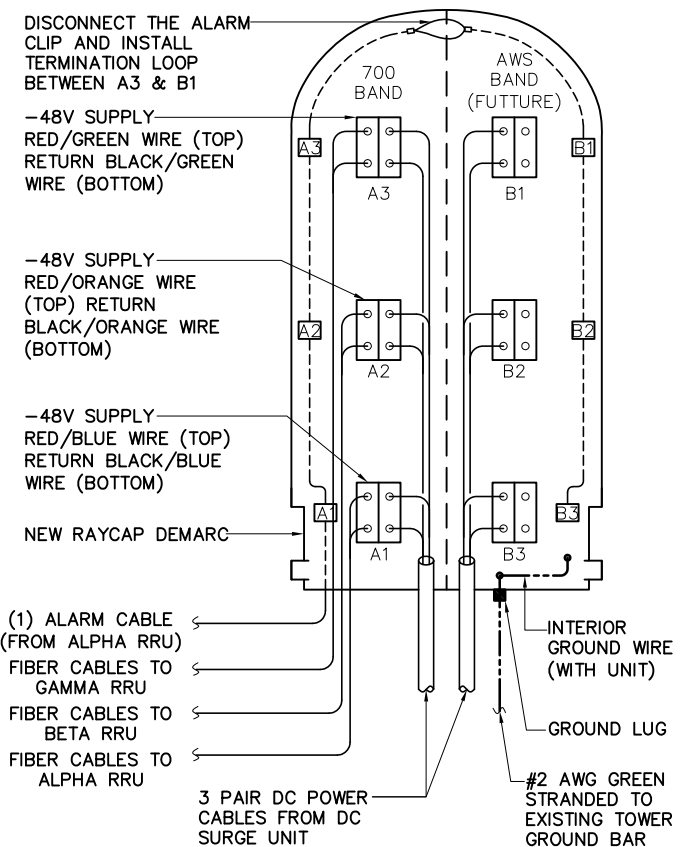


- NOTES:
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
  2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
  3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6



550 COCHITUATE ROAD  
SUITE 550 13 AND 14  
FRAMINGHAM, MA 01701



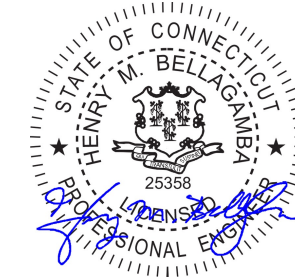
1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
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SHEET NAME  
**GROUNDING DETAILS**

SHEET NUMBER  
**A8**

GROUNDING SCHEMATIC SCALE: N.T.S. 1

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