smartlink

March 10th, 2017

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

Re: **Notice of Exempt Modification – RRU Add**
Property Address: **47 Turnpike Road, 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 170-feet on an existing 170-foot monopole, owned by Cordless Data Transfer at 600 Old Hartford Road, Colchester, CT 06415. AT&T now intends to retain all existing antennas, and add three (3) RRUS-12's on position 3 in all sectors, while retaining three (3) existing RRUS-11 on position 3 in all sectors at the 170-foot level antenna mount.

Per the Zoning Compliance Permit issued on June 23st, 2005 by the Town of Willington, and the Connecticut Siting Council Decision and Order Docket No. 267, dated February 3, 2004 the construction of a 170 foot telecommunications tower was approved. Please refer to the attached Order Docket No. 267 for the conditions of the approval.

Attached is the zoning permit and Docket No. referenced above, 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. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Susan Yergensen, Planning-Zoning/Wetlands Agent, Willington Town Office Building, 40 Old Farms Road, Willington, CT 06279 and to Christina B. Mailhos, First Selectman, Willington Town Office Building, 40 Old Farms Road, Willington, CT 06279. A copy of this letter is also being sent to the Property Owner William & Hazel Barber at 88 Slater Rd. Tolland, CT 06084 and the Tower Owner Cordless Data Transfer Inc, 600 Old Hartford Road, Colchester, CT 06415.

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

- **EM-CING-160-050504** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 45 Turnpike Road, **Willington**, Connecticut.

- **EM-CING-160-120820** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 47 Turnpike 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 170-foot level of the 170-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and 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,

Romina Kirchmaier

CC w/enclosures:
Christina B. Mailhos, First Selectman, Town of Willington
Susan Yergensen, Planning-Zoning / Wetlands Agent, Town of Willington
Barber & Hazel William, Property Owner
Cordless Data Transfer, Tower Owner

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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 – 10035378
Site ID – CTV1089 (2C)
USID – 86601
Site Name – Willington Turnpike Road
Site Compliance Report

47 Turnpike Road
Willington, CT 06279

Latitude: N41-55-31.91
Longitude: W72-15-08.60
Structure Type: Guyed

Report generated date: March 2, 2017
Report by: Young Kim
Customer Contact: David Barbagallo

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	No
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will be compliant

Note: Data concerning all other carriers on site was unavailable and therefore not included.

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTV1089_2016-LTE-Next-Carrier_LTE-2C_om636a_PTN_10035378_86601_03-09-2016_Preliminary-Approved_v2.00 (1)

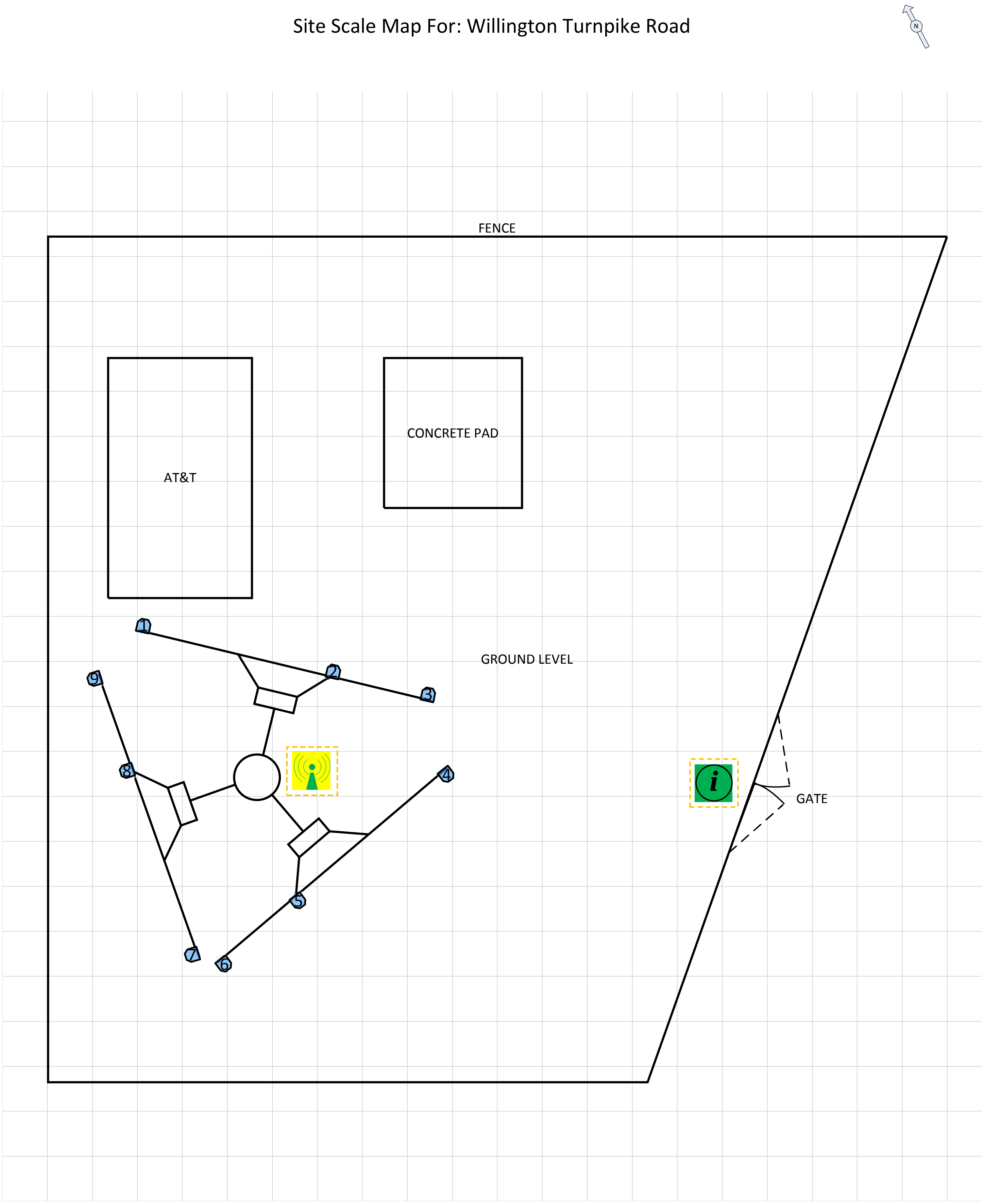
CD's: 10035378_AE201_160901_CTL01089_REV1

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View – South

Site Scale Map For: Willington Turnpike Road



(Feet)

0 5.4 10.9

www.sitesafe.com
Site Name:Willington Turnpike Road
3/2/2017 4:12:35 PM

Carrier Identification

AT&T MOBILITY LLC
VERIZON WIRELESS
T-MOBILE
SPRINT
UNKNOWN CARRIER

Sign Legend

Caution 1
Caution 2
Notice 1
Notice 2
Info 1
Info 2
Warning

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory was obtained by the customer and 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 7770	Panel	850	40	82	4.6	11.51	0	1	0	250	28.5'	78.2'	167.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	40	86	4.6	13.41	0	1	0	366.4	28.5'	78.2'	167.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	40	86	4.6	13.41	0	1	0	554.6	28.5'	78.2'	167.7'
2	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	40	65	6	13.36	0	0	1	1119.4	44.3'	74.4'	167'
2	AT&T MOBILITY LLC (Proposed)	KMW AM-X-CD-16-65-00T	Panel	1900	40	67	6	15.26	0	0	1	2182.7	44.3'	74.4'	167'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	40	82	4.6	11.51	1	0	0	129.7	52.2'	72.5'	167.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	40	86	4.6	13.41	1	0	0	548.3	52.2'	72.5'	167.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	170	82	4.6	11.51	0	1	0	250	53.7'	65.8'	167.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	170	86	4.6	13.41	0	1	0	366.4	53.7'	65.8'	167.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	170	86	4.6	13.41	0	1	0	554.6	53.7'	65.8'	167.7'
5	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	170	71	8	13.733	0	0	1	1475.7	41.4'	55.2'	166'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNH-1D6565C	Panel	1900	170	57	8	15.504	0	0	1	2421	41.4'	55.2'	166'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	170	82	4.6	11.51	1	0	0	129.7	35.2'	50'	167.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	170	86	4.6	13.41	1	0	0	548.3	35.2'	50'	167.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	280	82	4.6	11.51	0	1	0	250	32.5'	50.8'	167.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	280	86	4.6	13.41	0	1	0	366.4	32.5'	50.8'	167.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	280	86	4.6	13.41	0	1	0	554.6	32.5'	50.8'	167.7'
8	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	280	65	6	13.36	0	0	1	1119.4	27.1'	66.1'	167'
8	AT&T MOBILITY LLC (Proposed)	KMW AM-X-CD-16-65-00T	Panel	1900	280	67	6	15.26	0	0	1	2182.7	27.1'	66.1'	167'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	280	82	4.6	11.51	1	0	0	129.7	24.4'	73.8'	167.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	280	86	4.6	13.41	1	0	0	548.3	24.4'	73.8'	167.7'

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 the main site level unless otherwise indicated. 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.

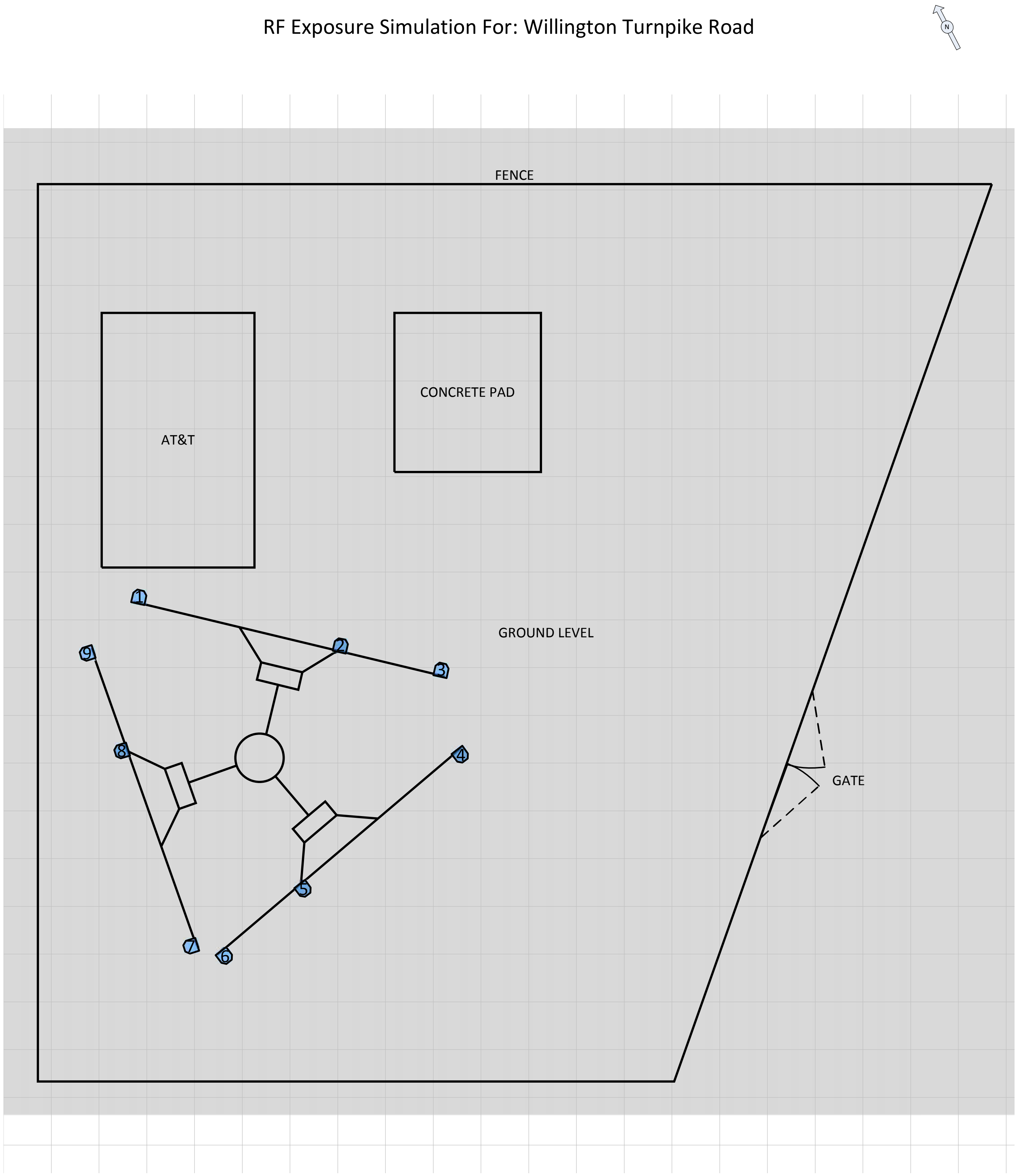
Note: The 1900MHz LTE technology is being added to existing antennas.

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 Turnpike Road



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

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC · VERIZON WIRELESS · T-MOBILE · SPRINT · UNKNOWN CARRIER

(Feet)

0 5.6 11.2

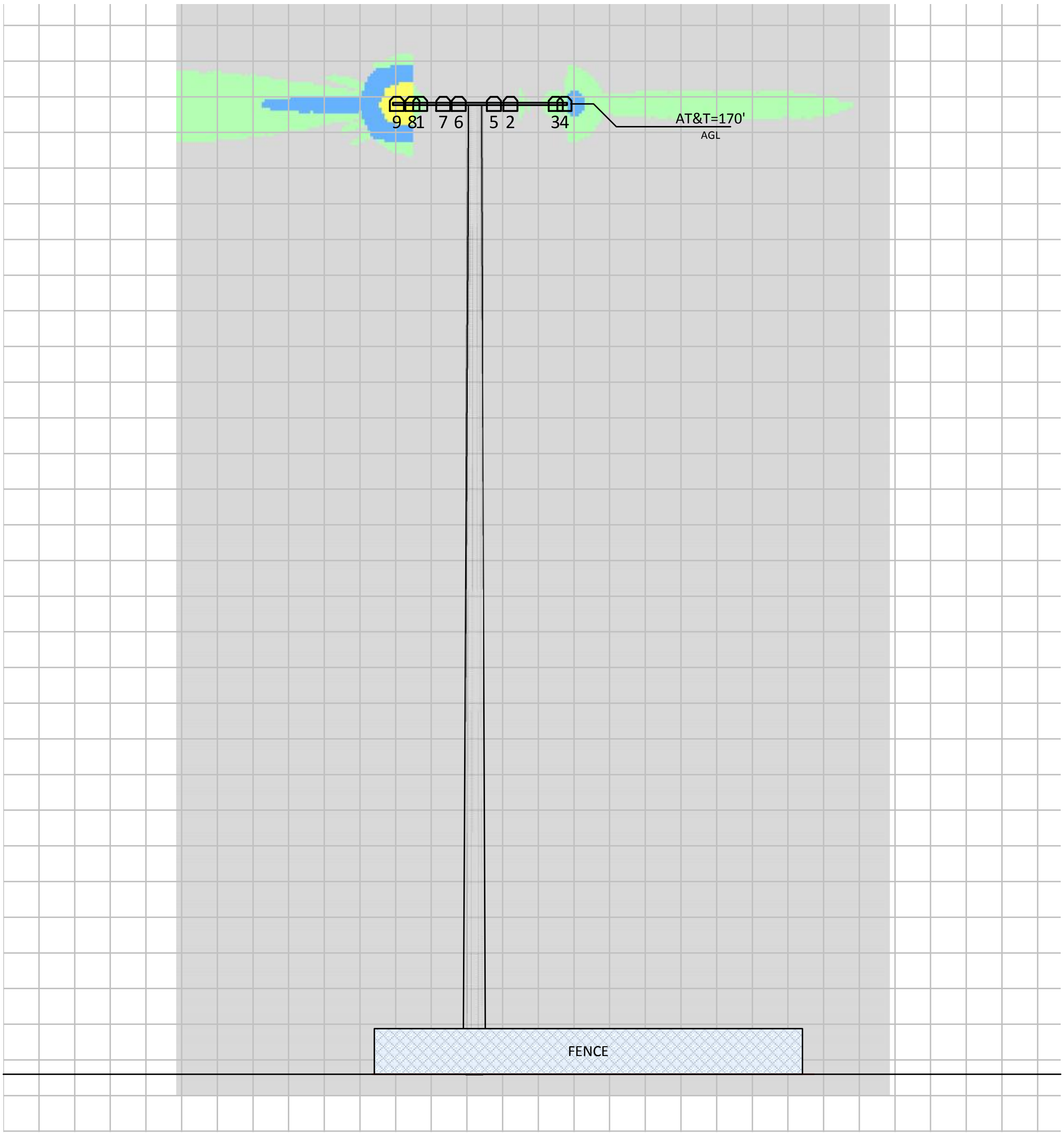
www.sitesafe.com
Site Name:Willington Turnpike Road
3/2/2017 4:13:28 PM

Barrier

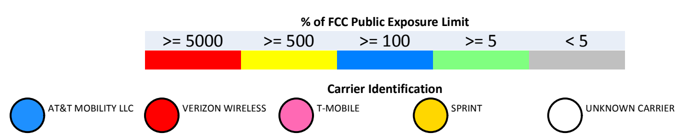
Proposed Barriers/ Signs

SitesafeTC Version:1.0.0.0 - 0.0.0.257
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Willington Turnpike Road
Elevation View – South



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



(Feet)

0 13.1 26.2

www.sitesafe.com
Site Name:Willington Turnpike Road
3/2/2017 4:24:55 PM

Barrier

Proposed Barriers/ Signs

SitesafeTC Version:1.0.0.0 - 0.0.0.257
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Single Level (0)

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:

Monopole Base

Yellow caution 2 sign required.

Site Access Location

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 Young Kim.

March 2, 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 Communication 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.

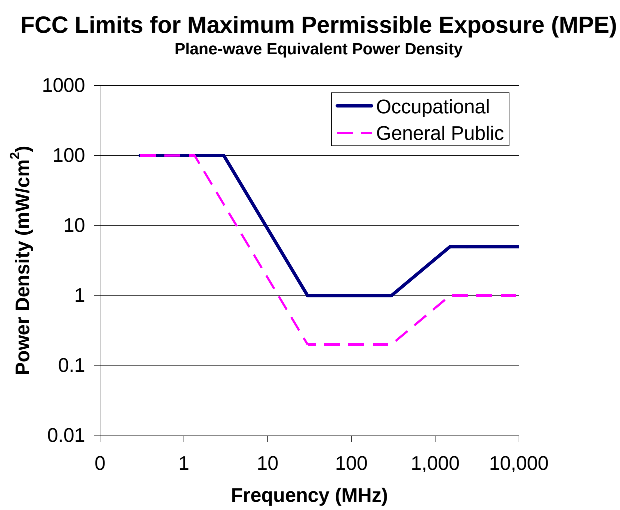
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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:



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^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	$(900/f^2)$*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

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^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)$*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz   *Plane-wave equivalent power density

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:

- 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**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- 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**.
- 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**.
- 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.

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
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_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
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	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type	Other Losses	Input Power
1	AT&T MOBILITY LLC	850	17.66005781	1	0			17.66005781
1	AT&T MOBILITY LLC	1900	16.71101675	1	0			16.71101675
1	AT&T MOBILITY LLC	1900	25.29317547	1	0			25.29317547
2	AT&T MOBILITY LLC	737	51.6416423	1	0			51.6416423
2	AT&T MOBILITY LLC (Proposed)	1900	65.01297166	1	0			65.01297166
3	AT&T MOBILITY LLC	850	9.161644996	1	0			9.161644996
3	AT&T MOBILITY LLC	1900	25.00313599	1	0			25.00313599
4	AT&T MOBILITY LLC	850	17.66005781	1	0			17.66005781
4	AT&T MOBILITY LLC	1900	16.71101675	1	0			16.71101675
4	AT&T MOBILITY LLC	1900	25.29317547	1	0			25.29317547
5	AT&T MOBILITY LLC	737	62.47411855	1	0			62.47411855
5	AT&T MOBILITY LLC (Proposed)	1900	68.17105131	1	0			68.17105131
6	AT&T MOBILITY LLC	850	9.161644996	1	0			9.161644996
6	AT&T MOBILITY LLC	1900	25.00313599	1	0			25.00313599
7	AT&T MOBILITY LLC	850	17.66005781	1	0			17.66005781
7	AT&T MOBILITY LLC	1900	16.71101675	1	0			16.71101675
7	AT&T MOBILITY LLC	1900	25.29317547	1	0			25.29317547
8	AT&T MOBILITY LLC	737	51.6416423	1	0			51.6416423
8	AT&T MOBILITY LLC (Proposed)	1900	65.01297166	1	0			65.01297166
9	AT&T MOBILITY LLC	850	9.161644996	1	0			9.161644996
9	AT&T MOBILITY LLC	1900	25.00313599	1	0			25.00313599

StartSymbolData

Calc			(ft)	(ft)	(ft)		(ft)	dBd	BWdth
Power	Mfg	Model	X	Y	Z	Type	Aper	Gain	Pt Dir
	Powerwave	7770	28.46	78.19	167.7085	Panel	4.583	11.51	82;40
	Powerwave	7770	28.46	78.19	167.7085	Panel	4.583	13.41	86;40
	Powerwave	7770	28.46	78.19	167.7085	Panel	4.583	13.41	86;40
	KMW	AM-X-CD-16-65-00T	44.28	74.37	167	Panel	6	13.36	65;40
	KMW	AM-X-CD-16-65-00T	44.28	74.37	167	Panel	6	15.26	67;40
	Powerwave	7770	52.18	72.46	167.7085	Panel	4.583	11.51	82;40
	Powerwave	7770	52.18	72.46	167.7085	Panel	4.583	13.41	86;40
	Powerwave	7770	53.73	65.76	167.7085	Panel	4.583	11.51	82;170
	Powerwave	7770	53.73	65.76	167.7085	Panel	4.583	13.41	86;170
	Powerwave	7770	53.73	65.76	167.7085	Panel	4.583	13.41	86;170
	Andrew	SBNH-1D6565C	41.37	55.23	165.9835	Panel	8.033	13.733	71;170
	Andrew	SBNH-1D6565C	41.37	55.23	165.9835	Panel	8.033	15.504	57;170
	Powerwave	7770	35.19	49.96	167.7085	Panel	4.583	11.51	82;170
	Powerwave	7770	35.19	49.96	167.7085	Panel	4.583	13.41	86;170
	Powerwave	7770	32.5	50.75	167.7085	Panel	4.583	11.51	82;280
	Powerwave	7770	32.5	50.75	167.7085	Panel	4.583	13.41	86;280
	Powerwave	7770	32.5	50.75	167.7085	Panel	4.583	13.41	86;280
	KMW	AM-X-CD-16-65-00T	27.07	66.08	167	Panel	6	13.36	65;280
	KMW	AM-X-CD-16-65-00T	27.07	66.08	167	Panel	6	15.26	67;280
	Powerwave	7770	24.36	73.75	167.7085	Panel	4.583	11.51	82;280
	Powerwave	7770	24.36	73.75	167.7085	Panel	4.583	13.41	86;280

Uptime Profile	ON flag
100%	ON•
100%	ON•
100%	ON•
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100%	ON•

PROJECT: LTE 2C

SITE NUMBER: CTL01089

FA NUMBER: 10035378

PTN NUMBER: 2051A066GT

PACE NUMBER: MRCTB018150

SITE NAME: WILLINGTON TPKE RD

SITE ADDRESS: 47 TURNPIKE ROAD
WILLINGTON, CT 06279

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

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

PROJECT INFORMATION

SITE NAME:	WILLINGTON TPKE RD
SITE NUMBER:	CTL01089
SITE ADDRESS:	47 TURNPIKE ROAD WILLINGTON, CT 06279
FA NUMBER:	10035378
PTN NUMBER:	2051A066GT
PACE NUMBER:	MRCTB018150
USID NUMBER:	86601
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	CORDLESS DATA TRANSFER INC. 600 OLD HARTFORD ROAD COLCHESTER, CT 06415
JURISDICTION:	TOWN OF WILLINGTON, CT
COUNTY:	TOLLAND
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.925539°
LONGITUDE:	−72.252393°
GROUND ELEV.:	680'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	CAMERON SYME
PHONE:	(508) 596−7146
EMAIL:	cs6970@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102, BUILDING #3 NORTH BILLERICA, MA 01862
CONTACT:	RYAN BURGDORFER (508) 665−8005
EMAIL:	Ryan.Burgdorfer@Smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102, BUILDING #3 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930−3918
EMAIL:	Sharon.Keefe@Smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908−8439
EMAIL:	MDimitrov@fullertonengineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102, BUILDING #3 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515−2080
EMAIL:	mark.donnelly@smartlinkllc.com

SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE, Q&D.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1111517, VERSION 2.00 LAST UPDATED 05/18/2016.

- (3) NEW RRUS−12 UNITS
- (3) NEW 25 AMP BREAKERS
- (1) NEW LTE DUS
- (1) NEW ARGUS CONVERTOR MODULE IN EXISTING POWER PLANT
- (3) NEW STIFFARM KITS

- 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

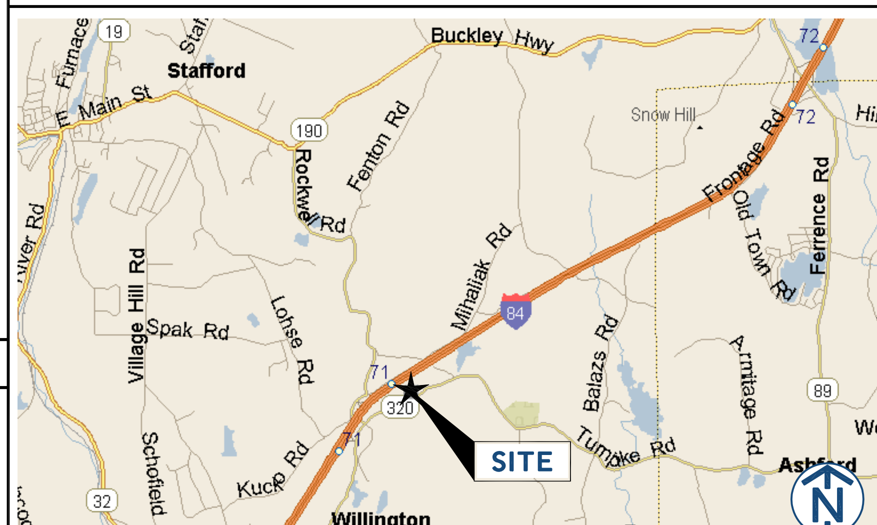
ELECTRICAL CODE: 2014 NATIONAL ELECTRIC CODE

- 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	06/15/16	90% REVIEW	VV
1	02/21/17	FOR PERMIT	KC

I HEREBY CERTIFY THAT THESE DRAWING 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



NO SCALE

DRAWING INDEX

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

DIRECTIONS

SCAN QR CODE FOR LINK TO SITE LOCATION MAP

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

SITE NAME
WILLINGTON TPKE RD

SITE NUMBER:
CTL01089

SITE ADDRESS
47 TURNPIKE ROAD
WILLINGTON, CT 06279

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

FEC# 2016.0200. 0003

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.

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SUITE 550 13 AND 14
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HENRY M. BELLAGAMBA
25358
LICENSED
PROFESSIONAL ENGINEER

SITE NAME
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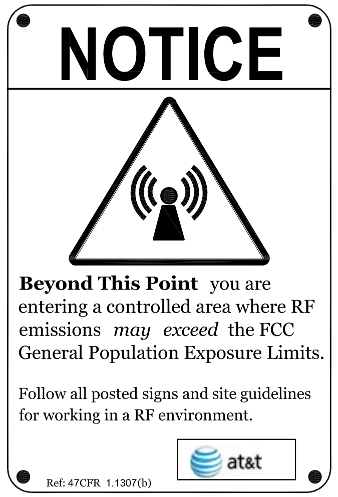
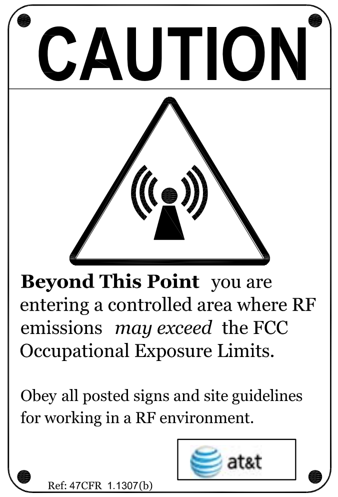
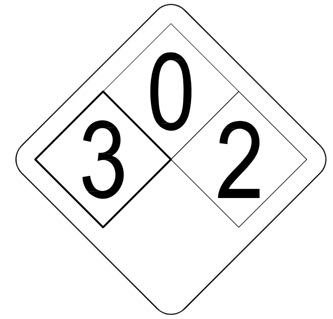




ALERTING SIGNS



ALERTING SIGN
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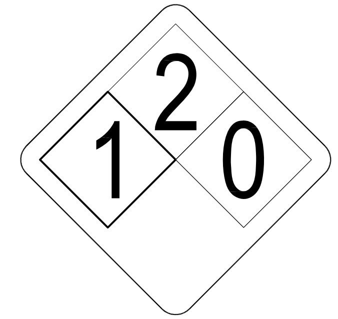

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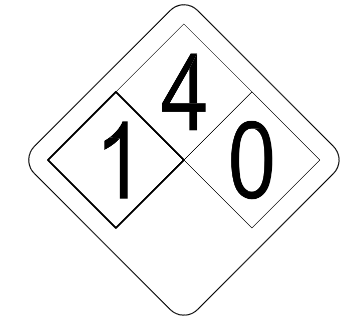
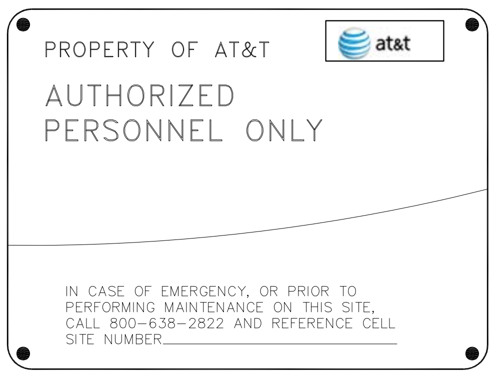


ALERTING SIGN
(FOR PROPANE)

ALERTING SIGN



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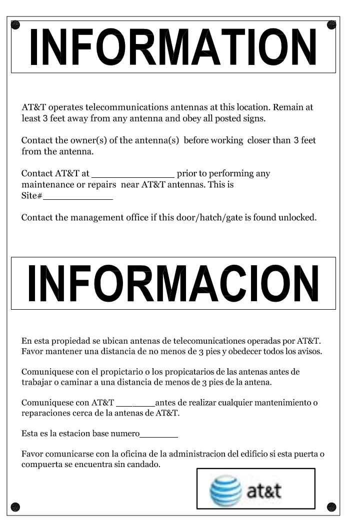

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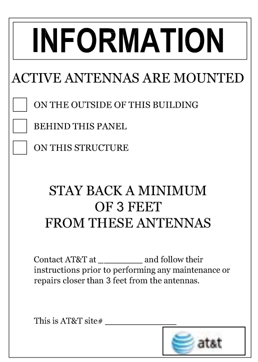

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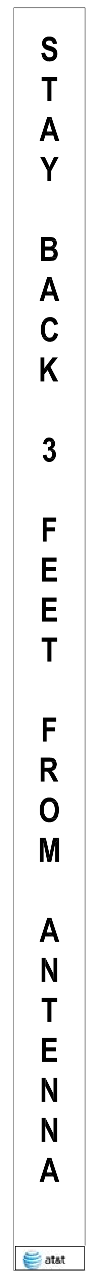

INFO SIGN #3

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
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	
TOWERS							
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		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	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

NOTES FOR ROOFTOP SITES:

1. 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
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. 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.

SIGNAGE GUIDELINES CHART

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SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
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HANOVER, MD 21076

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SCHAUMBURG, ILLINOIS 60173
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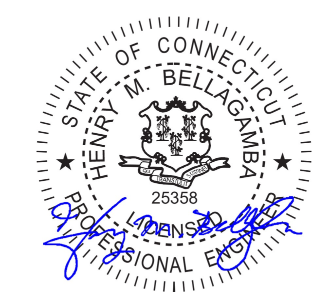

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47 TURNPIKE ROAD
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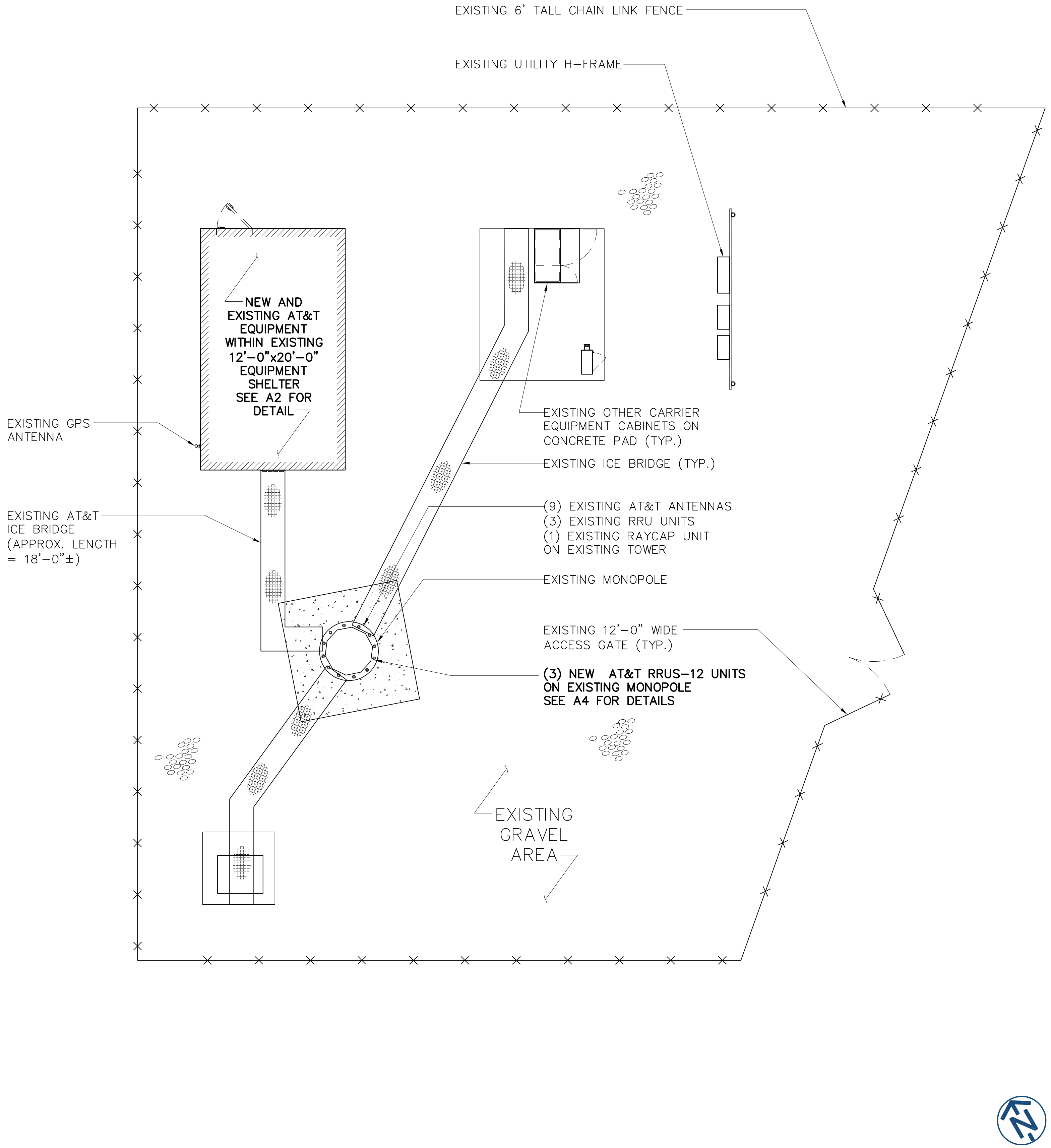
ABBREVIATIONS

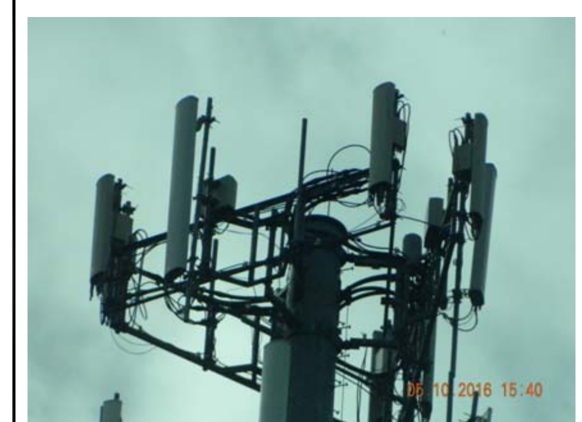
AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
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	PROPERY 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
	GRAVEL
	CONCRETE
	MASONRY
	EARTH
	STEEL
	CENTERLINE
	PROPERTY LINE
	LEASE LINE
	EASEMENT LINE
—×—×—	CHAIN LINK FENCE
—□—□—	WOOD FENCE
—UE—	BELOW GRADE ELECTRIC
—UT—	BELOW GRADE TELEPHONE
—OE/OT—	OVERHEAD ELECTRIC/TELEPHONE
A / S-1, A	SECTION REFERENCE



COMPOUND PLAN — SCALE: 3/32" = 1'-0" — 1



SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 3 — SCALE: N.T.S. — 3

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ENGINEERING · DESIGN
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SCHAUMBURG, ILLINOIS 60173
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HENRY M. BELLAGAMBA
25358
LICENSED
PROFESSIONAL ENGINEER

SITE NAME

WILLINGTON TPKE RD

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CTL01089

SITE ADDRESS

47 TURNPIKE ROAD
WILLINGTON, CT 06279

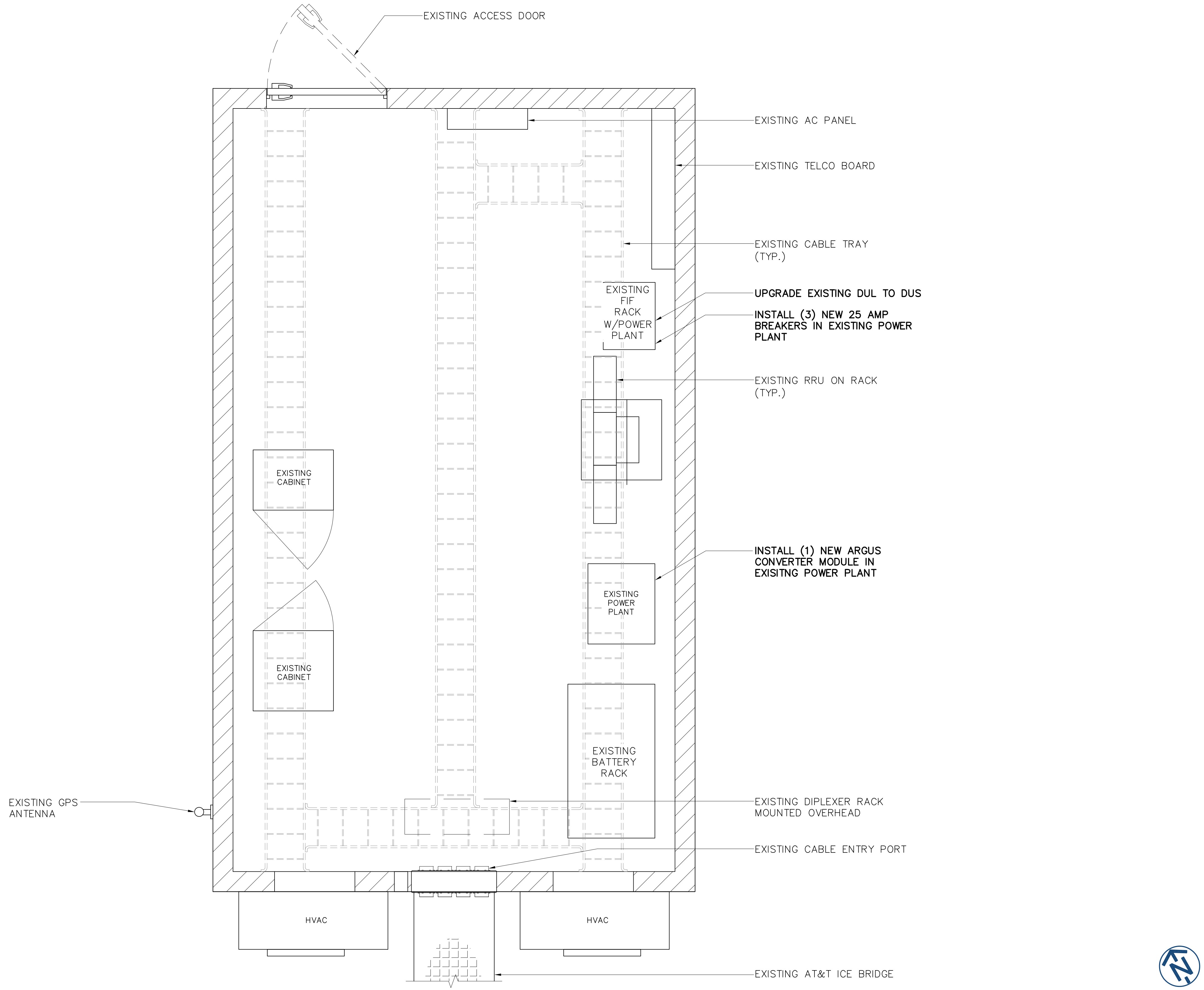
SHEET NAME

COMPOUND PLAN

SHEET NUMBER

A1

FEC# 2016.0200. 0003



EQUIPMENT PLAN

SCALE: 3/8" = 1'-0" | 1

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EQUIPMENT PLAN

SHEET NUMBER
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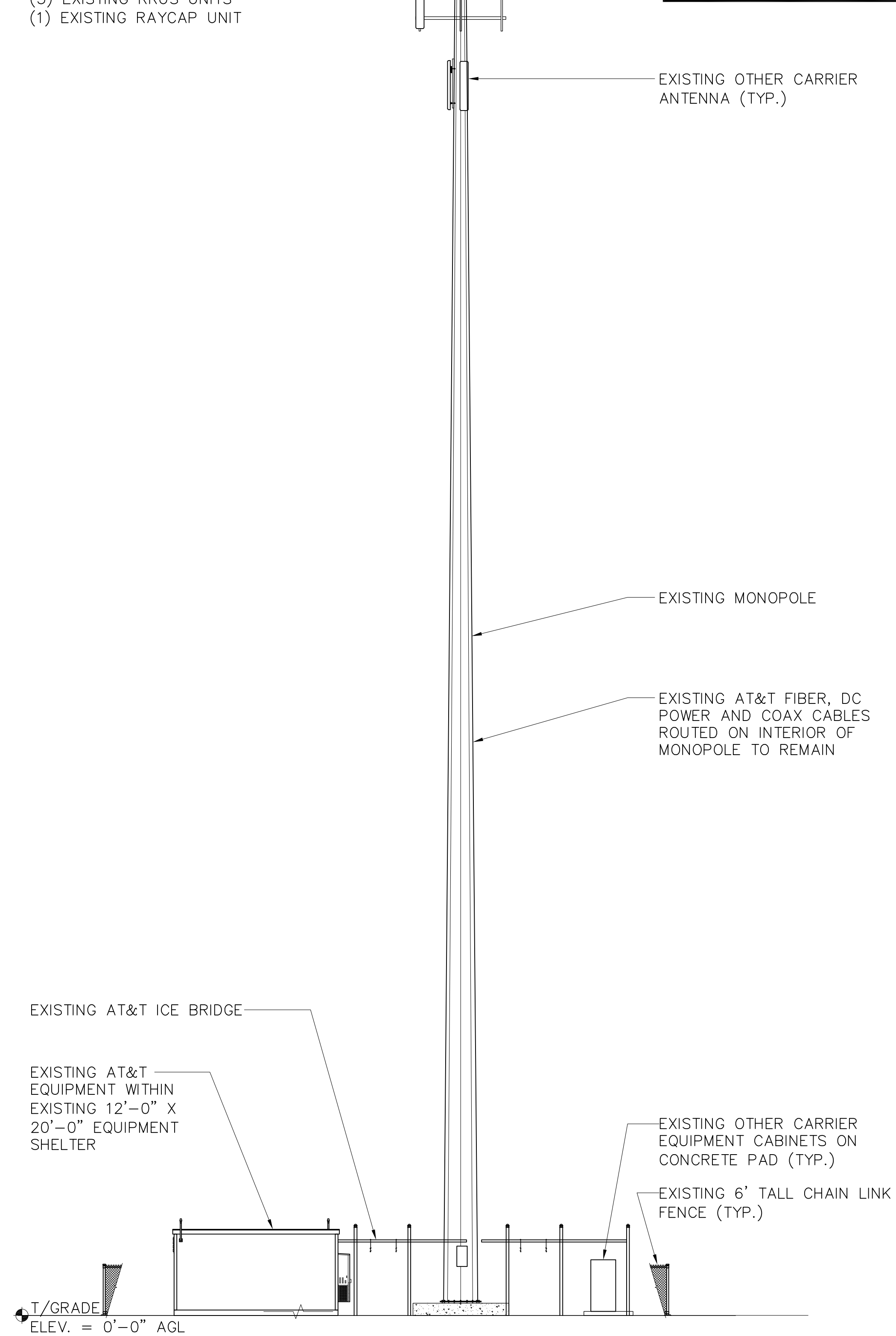
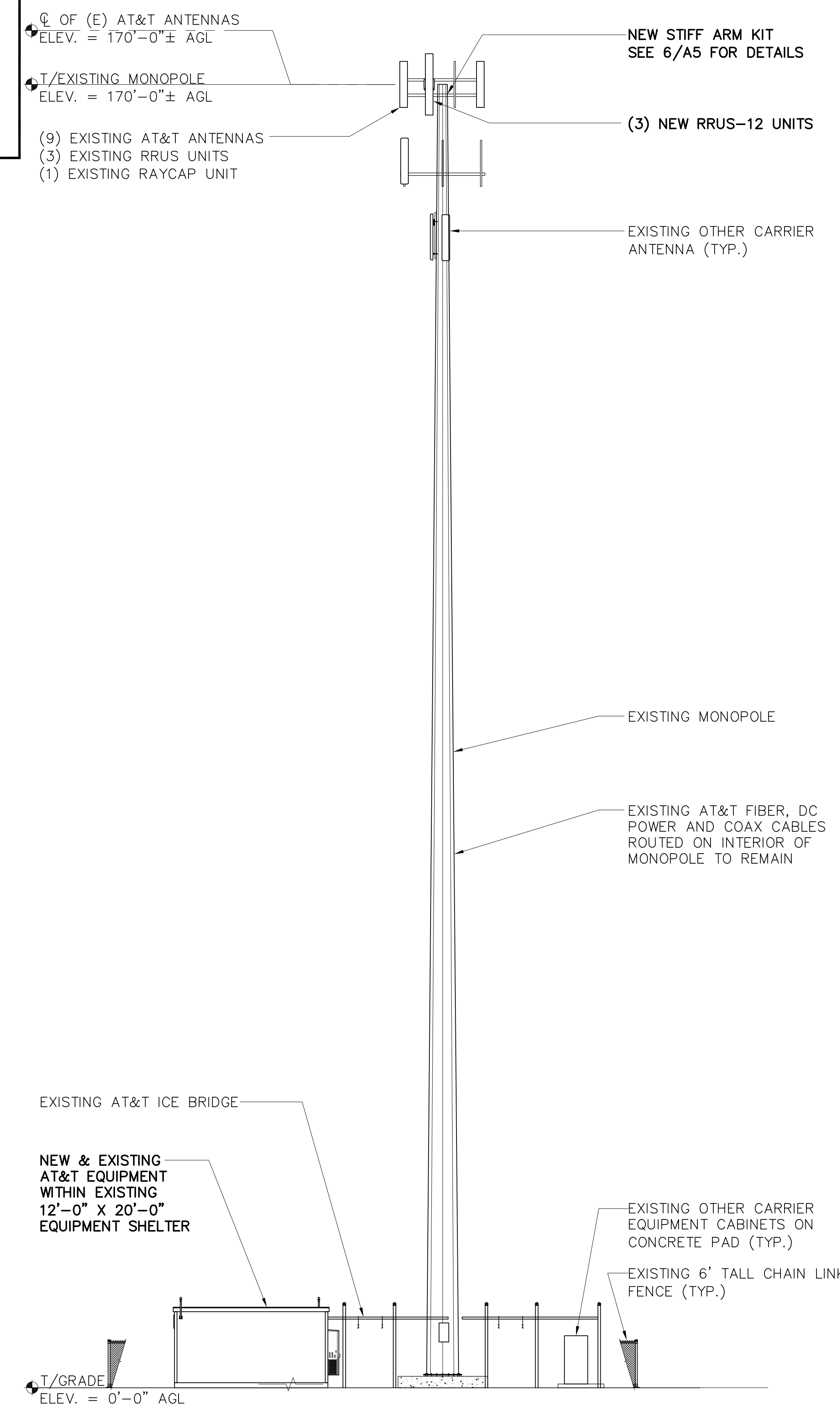
FEC# 2016.0200. 0003

NOTES:

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



EXISTING ELEVATION — SCALE: 1" = 30'-0" — 1



NEW ELEVATION — SCALE: 1" = 30'-0" — 2

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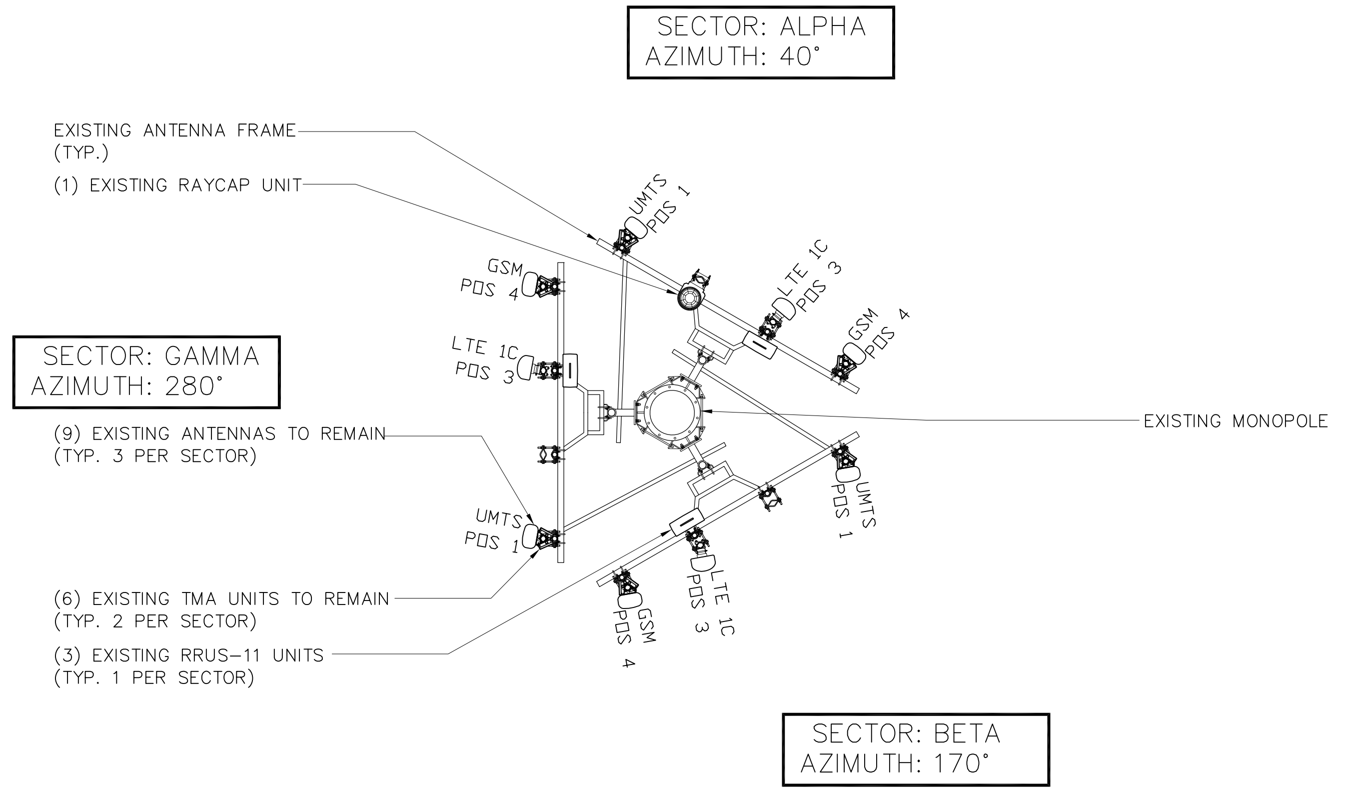
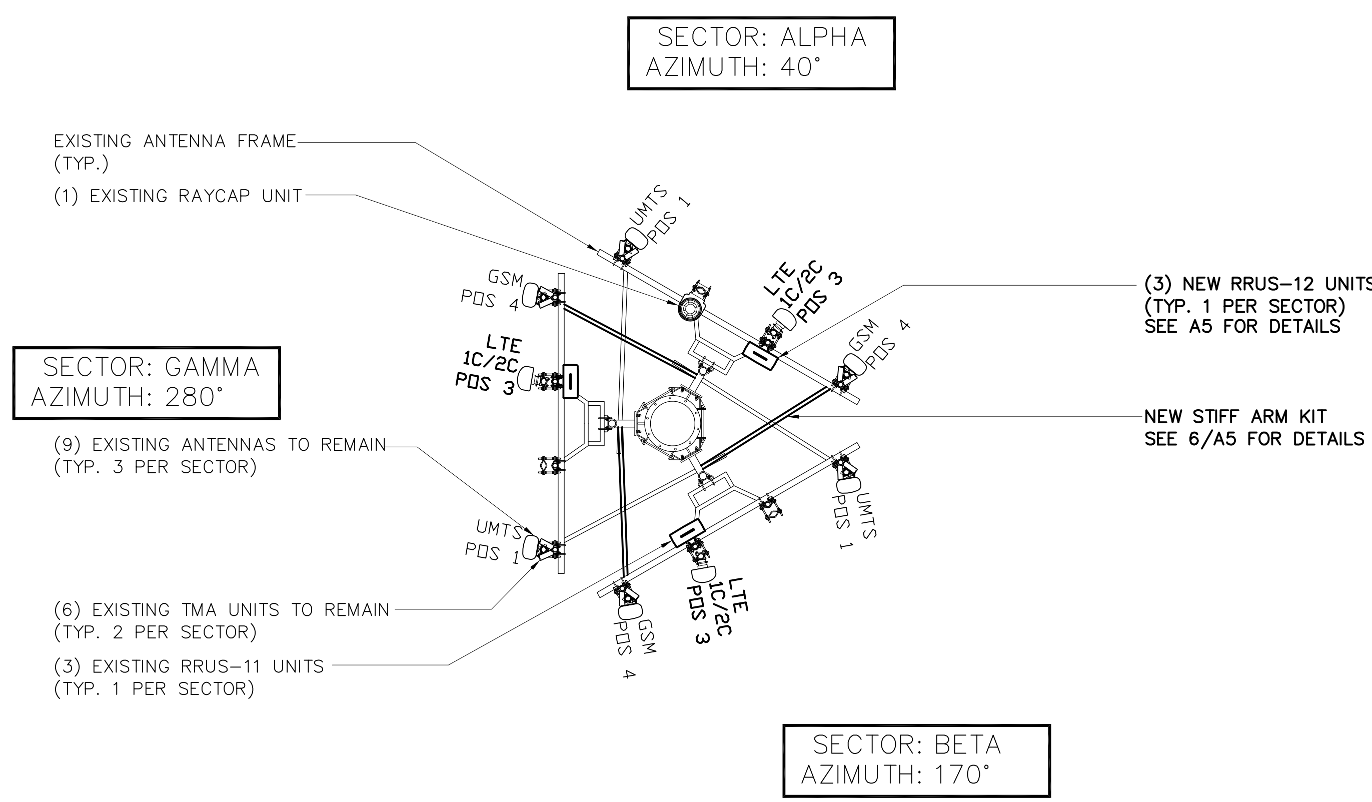


EXISTING ANTENNA PLAN — SCALE: 1/8" = 1'–0" — 1



FINAL ANTENNA PLAN — SCALE: 1/8" = 1'–0" — 2

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ANTENNA PLANS

SHEET NUMBER
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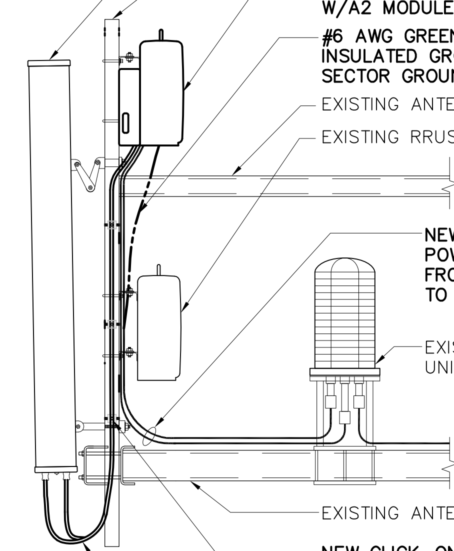
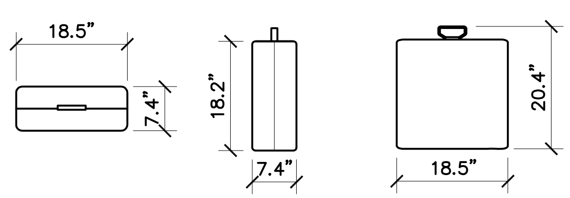
NOT USED	SCALE: N.T.S.	1

NOT USED	SCALE: N.T.S.	2



ANTENNA SCHEMATIC	SCALE: N.T.S.	3

NOT USED	SCALE: N.T.S.	4



PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 12

WITH SOLAR SHIELD

UNIT WEIGHT 52.2 Lbs

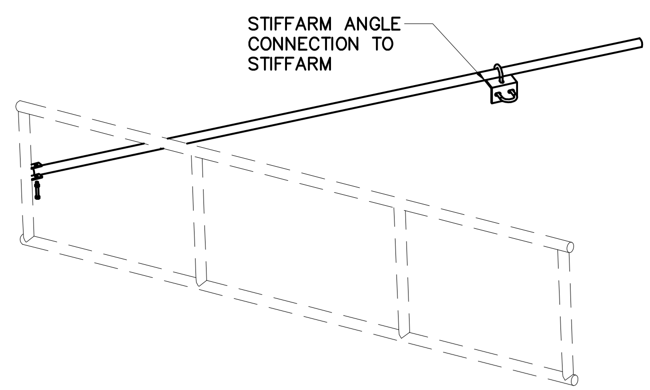
RRU SPEC	SCALE: N.T.S.	5

PRODUCT INFORMATION

BOOM STIFF ARM
MFR: FRED A. NUDD CORPORATION
1.5X12 BOOM STIFFARM KIT

KIT INCLUDES:

1 – 1/2"x3-1/2" BOLT
1 – 1/2" NUT
1 – 1-1/2"x12' STIFFARM
1 – 1-1/2" U-BOLT
1 – MOUNTING BRACKET PER MEMBER SIZE
1 – U-BOLT PER MEMBER SIZE



STIFF ARM KIT DETAIL	SCALE: N.T.S.	6

NOT USED	SCALE: N.T.S.	7

NOT USED	SCALE: N.T.S.	8

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REV	DATE	DESCRIPTION	BY
0	06/15/16	90% REVIEW	VV
1	02/21/17	FOR PERMIT	KC

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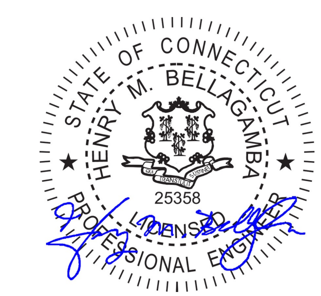

SITE NAME

WILLINGTON TPKE RD

SITE NUMBER:

CTL01089

SITE ADDRESS

47 TURNPIKE ROAD
WILLINGTON, CT 06279

SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5

FEC# 2016.0200. 0003

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (05/18/16)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	40°	170'-0"	1-5/8"ø LDF7-50A (2) 1-5/8"ø LDF7-50A	195'-0" 195'-0"	(1) (E) DC6-48-60-18-8F UNIT
ALPHA	A-2	–	–	–	–	–	–	–		
ALPHA	A-3	(N) LTE1C/2C ANTENNA	AM-X-CD-16-65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT	40°	170'-0"	(1) EXISTING FIBER CABLE (2) EXISTING DC POWER CABLES	195'-0" 195'-0"	
ALPHA	A-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	40°	170'-0"	1-5/8"ø LDF7-50A 1-5/8"ø LDF7-50A	195'-0" 195'-0"	
BETA	B-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	170°	170'-0"	1-5/8"ø LDF7-50A (2) 1-5/8"ø LDF7-50A	195'-0" 195'-0"	
BETA	B-2	–	–	–	–	–	–	–		
BETA	B-3	(N) LTE1C/2C ANTENNA	SBNH-1D6565C	COMMSCOPE	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT	170°	170'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
BETA	B-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	170°	170'-0"	1-5/8"ø LDF7-50A 1-5/8"ø LDF7-50A	195'-0" 195'-0"	
GAMMA	C-1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	280°	170'-0"	1-5/8"ø LDF7-50A (2) 1-5/8"ø LDF7-50A	195'-0" 195'-0"	
GAMMA	C-2	–	–	–	–	–	–	–		
GAMMA	C-3	(N) LTE1C/2C ANTENNA	AM-X-CD-16-65-00T-RET	KMW	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT	280°	170'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
GAMMA	C-4	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	280°	170'-0"	1-5/8"ø LDF7-50A 1-5/8"ø LDF7-50A	195'-0" 195'-0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S. 1

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

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STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED
PROFESSIONAL ENGINEER

SITE NAME
WILLINGTON TPKE RD

SITE NUMBER:
CTL01089

SITE ADDRESS
47 TURNPIKE ROAD
WILLINGTON, CT 06279

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

FEC# 2016.0200. 0003

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. 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.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. 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.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. 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.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES
SCALE: N.T.S. 1

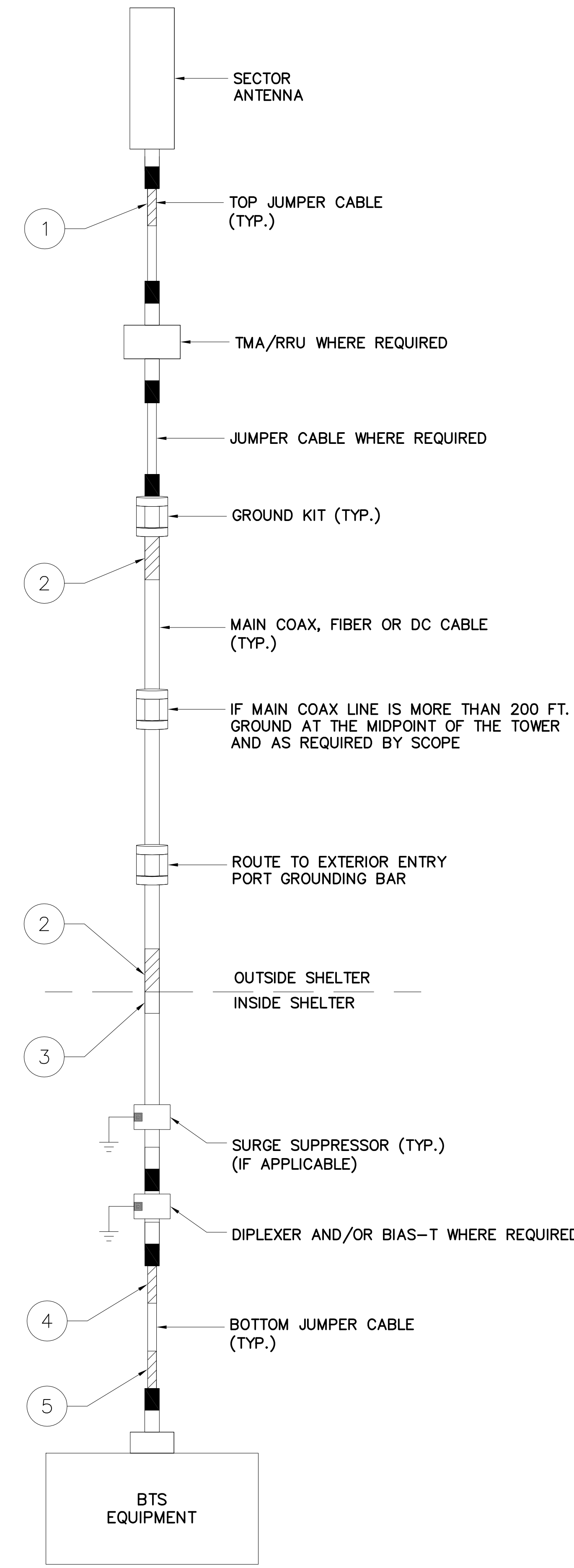
RF, DC, & COAX CABLE MARKING LOCATIONS TABLE

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

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. 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.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. 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.
5. 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.
6. 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.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. 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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HENRY M. BELLAGAMBA
25358
LICENSED
PROFESSIONAL ENGINEER

SITE NAME
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SITE NUMBER:
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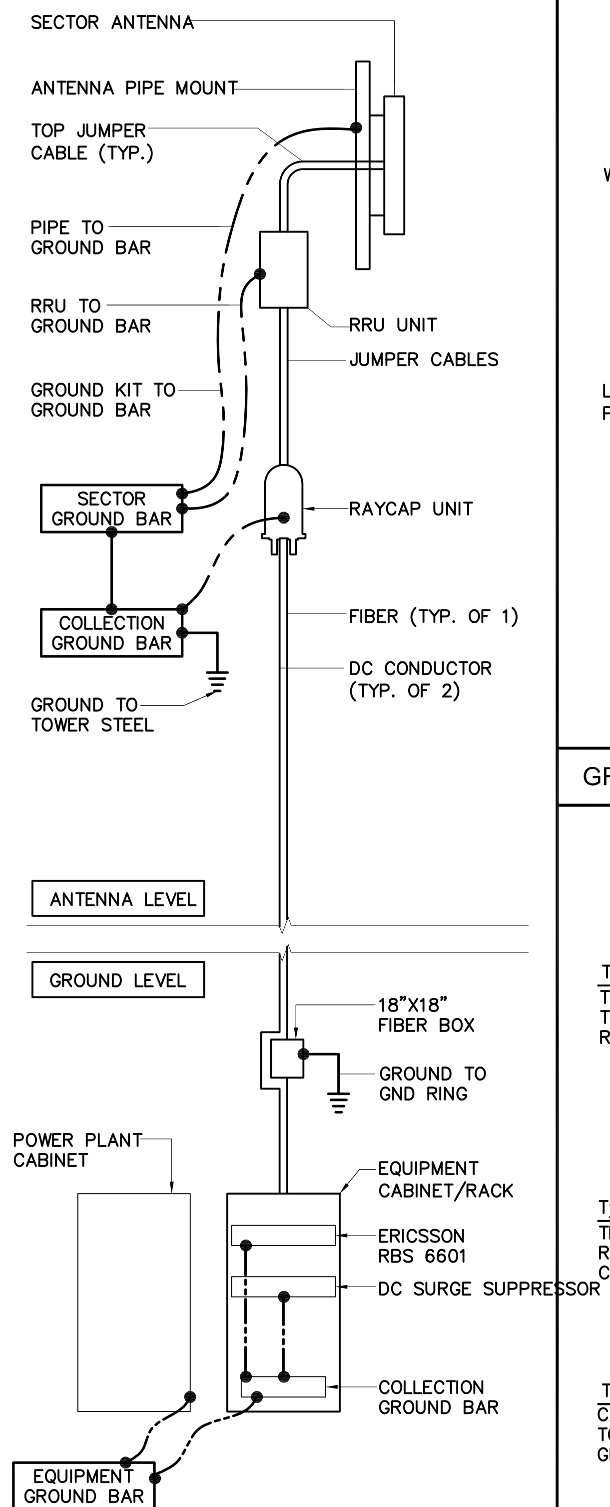
SITE ADDRESS
47 TURNPIKE ROAD
WILLINGTON, CT 06279

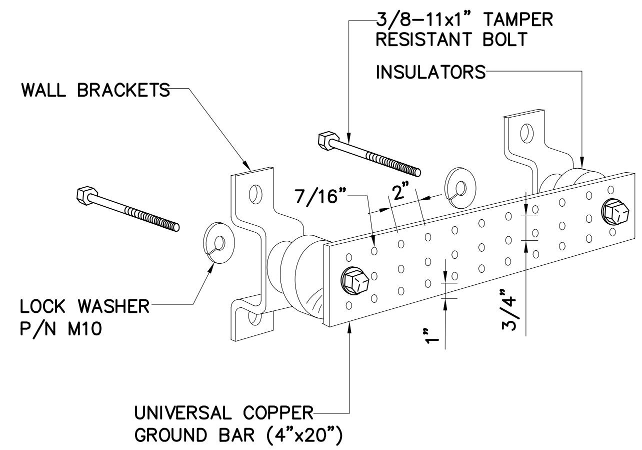
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

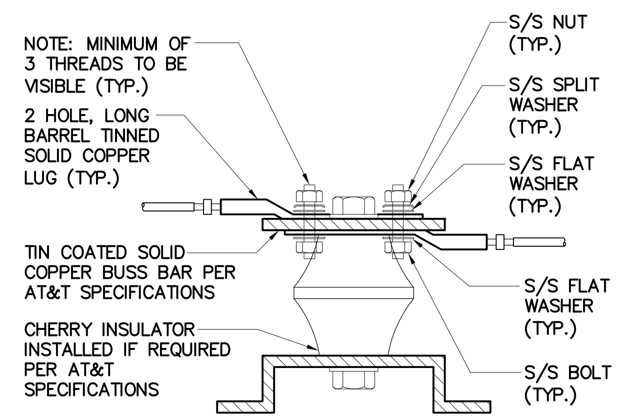
FEC# 2016.0200. 0003



GROUNDING SCHEMATIC SCALE: N.T.S. 1



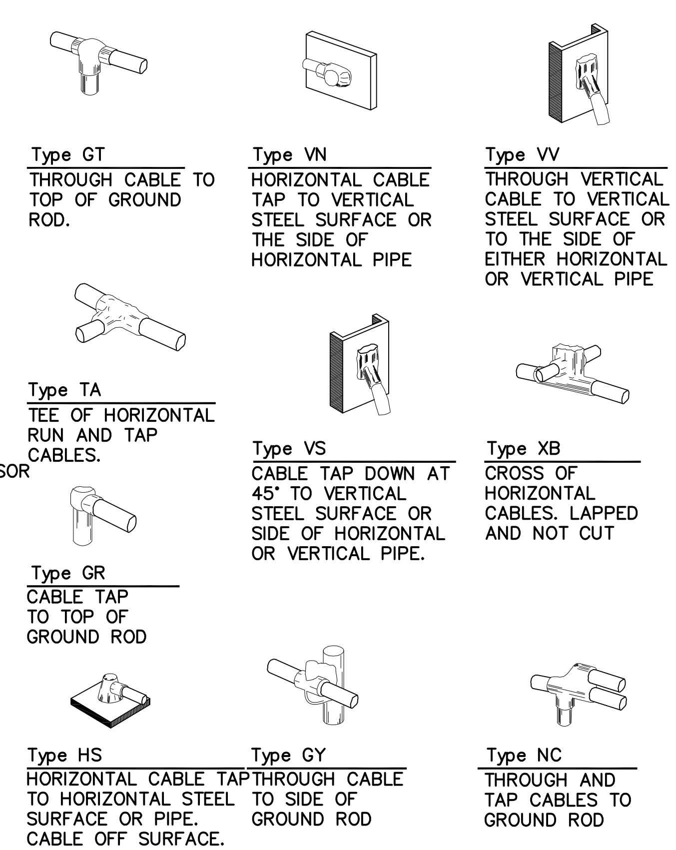
GROUND BAR DETAIL SCALE: N.T.S. 2



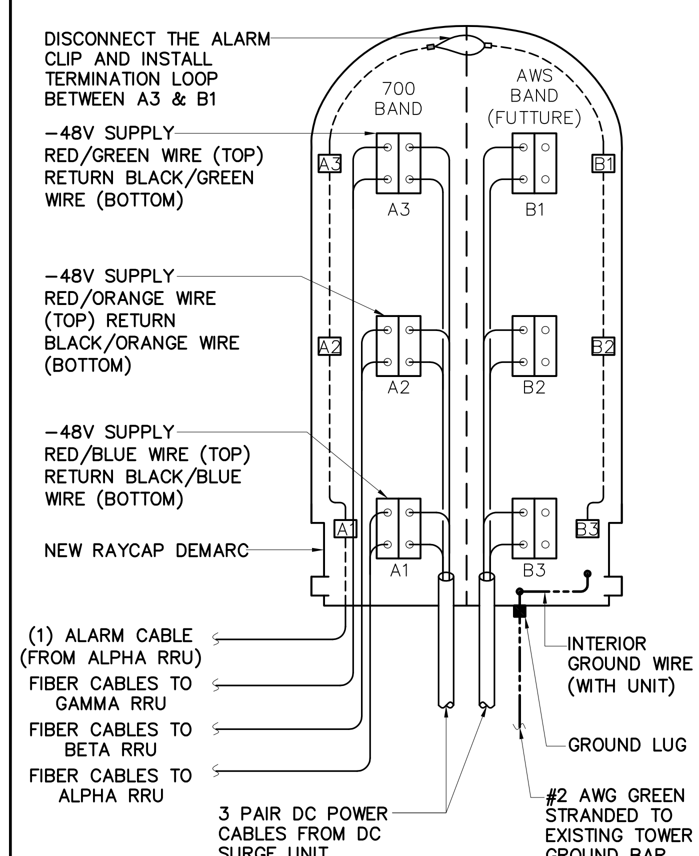
NOTES:

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

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SUITE 550 13 AND 14
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LICENSED
PROFESSIONAL ENGINEER

SITE NAME
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SITE NUMBER:
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SITE ADDRESS
47 TURNPIKE ROAD
WILLINGTON, CT 06279

SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
November 13, 2016

Nudd Job Number: 116-23148

Site Location: Willington, CT (47 Turnpike Road, Willington, CT 06279, Tolland County)

Subject: Structural Analysis of an existing 170 ft Monopole Tower

Fred A. Nudd Corporation has completed a structural analysis of an existing 170 ft monopole tower. The tower was originally designed by Fred A. Nudd Corporation. The tower analysis was completed considering ANSI/TIA-222-G design standards, which is the enforced design standard of the 2012 International Building Code, including 2016 Connecticut State Building Code. Tower and foundation dimensions have been taken from drawings by Fred A. Nudd, project number 9859, dated February 24, 2004 & March 1, 2004, respectively. Geotechnical information was taken from a subsurface exploration report by Coneco, project number C537, dated February 25, 2004. Design criteria per each analysis are noted on the following page. The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new AT&T. The new equipment to be installed, which included antennas, coax, mounts and associated hardware are listed on the following page, along with already installed cellular equipment, in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 47%. Detailed calculation of the applied forces and member capacities are provided in the following pages.

The tower base foundation was analyzed using soil properties from the aforementioned geotechnical report. Based on this analysis, the foundation is capable of supporting the existing and proposed equipment. Detailed calculation of the applied forces and member capacities are provided in the following pages.

In conclusion, the tower superstructure and substructure can support the proposed AT&T equipment in addition to the existing equipment and meet the aforementioned design standards for strength and serviceability.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,
Fred. A. Nudd Corporation

STATE OF CONNECTICUT
DAVID TAN
No. 22092
LICENSED
PROFESSIONAL ENGINEER

David Tan
12-14-16

David Tan, P.E. (CT PE # 22092)

Code Design Criteria

ANSI/TIA-222-G
Windspeed = 125 mph, 3-Second Gust, V_{ult}
Exposure = B
Structure Class / Risk Category = II
Radial Ice = 1.0 inch
Ice Windspeed = 50 mph, 3-Second Gust, V_{asd}
Topographic Category = I
Seismic = Site Class D, S_s & S_1 = 0.173 & 0.063, respectively

Appurtenance Loading – Existing and To Remain on Tower

Elevation (ft)[1]	Antenna	Mount	Coax (in)[2]
170	(6) Powerwave 7770 (2) KMW AM-X-CD-16-65-00T (12) Powerwave LGP 21401 (6) Ericsson RRUs11	(3) 12 ft Boom / Frame	(12) 1-5/8 (1) 3 in Conduit (2) 19.7 mm (1) 10 mm Fiber
159	(3) Commscope LNX-6515DS-VTM (3) Andrew Smart Bias Tee (3) EMS RR90-17-02DP (3) Ericsson KRY 112 71	Low Profile Platform	(12) 1-5/8

[1]*Note elevation is measured from grade to center of antenna*
[2]*All existing coax is installed inside the monopole shaft*

Proposed Appurtenance Loading – AT&T

Elevation (ft) [1]	Antenna	Mount	Coax[2]
170	(1) Andrew SBNH-1D6565C (3) Ericsson RRUS-12 (1) Raycap DC6-48-60-18-F	(3) 12 ft Boom / Frame	--

[1]*Note elevation is measured from grade to center of antenna*
[2]*Additional coax is to be installed inside the monopole shaft*

Maximum Member Usage Results

Member	Usage (%)[1]
Pole Shaft	47
Base Plate	39
Anchor Bolts	30

[1]*Usage above 100% indicates the applied design load exceeds the member strength capacity and requires strengthening*

Foundation Usage Results

Base Reaction	Capacity (kip-ft)	Analysis (kip-ft)	Usage[1]
Overturning	11352.6	2484.3	22

[1]*Usage above 100% indicates the applied design load exceeds the member strength capacity and requires strengthening*

Job Number:	116-23148
Site Name:	Wilmington CT
Engineer:	FAN
Date:	11/13/16

Design Criteria

Code Input:	TIA-222-G	Seismic Analysis Method:		Equivalent Lateral Force Procedure		
Design Windspeed:	125.0 mph	K_D:	0.95	Site Class:	D	
G_H:	1.10	Topo. Category:	1	Weight of Steel:	490	
Height of Crest:	0.0 ft	Structure Class:	II	Steel Elastic Modulus:	29000000	psi
Ice Windspeed:	50 mph	Exposure:	B	Wind Importance:	1.00	
Radial Ice:	1.00 in	D Load Factor 1:	1.2	Wind with Ice Importance:	1.00	
Operational Windspeed:	60 mph	D Load Factor 2:	0.9	Ice Thickness Importance:	1.00	
W Load Factor:	1.0	E Load Factor:	1.0	Earthquake Importance:	1.00	
W_i Load Factor:	1.0	D_i Load Factor:	1.0	S_S:	0.173	
Weight of Ice:	56 pcf	Ignore R_a Effect:	N	S_1:	0.063	

Tower Geometry Input:			
Top of Splice 1 Height:	46.5	ft	
Top of Splice 2 Height:	90	ft	
Top of Splice 3 Height:	134.5	ft	
Top of Splice 4 Height:	160	ft	
Top of Splice 5 Height:	170	ft	
Top of Tower:	170	ft	

Base Section - Section 1			Middle Section - Section 2		
ϕ - Bottom Sec. 1:	58.00	in	ϕ - Bottom Sec. 2:	50.38	in
ϕ - Top Sec. 1:	48.19	in	ϕ - Top Sec. 2:	39.81	in
T - Bottom Sec. 1:	0.375	in	T - Bottom Sec. 2:	0.375	in
Section Length:	46.50	ft	Section Length:	50.00	ft

Middle Section - Section 3			Middle Section - Section 4		
ϕ - Bottom Sec. 3:	41.63	in	ϕ - Bottom Sec. 4:	32.56	in
ϕ - Top Sec. 3:	31.06	in	ϕ - Top Sec. 4:	26.25	in
T - Bottom Sec. 3:	0.3125	in	T - Bottom Sec. 4:	0.2500	in
Section Length:	50.00	ft	Section Length:	30.00	ft

Middle Section - Section 5			Top Section - Section 6		
ϕ - Bottom Sec. 5:	26.25	in	ϕ - Bottom Sec. 6:		in
ϕ - Top Sec. 5:	22.00	in	ϕ - Top Sec. 6:		in
T - Bottom Sec. 5:	0.2500	in	T - Bottom Sec. 6:		in
Section Length:	10.00	ft	Section Length:		ft

Note: Diameters are across flats, when applicable.

Steel F_Y - Sec. 1:	65000	psi
Steel F_Y - Sec. 2:	65000	psi
Steel F_Y - Sec. 3:	65000	psi
Steel F_Y - Sec. 4:	65000	psi
Steel F_Y - Sec. 5:	65000	psi
Steel F_Y - Sec. 6:		psi
# of Sides - Sec. 1:	18	
# of Sides - Sec. 2:	18	
# of Sides - Sec. 3:	18	
# of Sides - Sec. 4:	18	
# of Sides - Sec. 5:	18	
# of Sides - Sec. 6:		

Site Number: 116-23148
Site Name: Wilmington CT
Engineer: FAN
Date: 11/13/2016
Code Input: TIA-222-G

Antenna/Mount Mechanical Properties, Wind, Weight and Ice Loads

Antenna (Name & Man.)	Height (in)	Width (in)	Depth (in)	Round /Flat (R/F)	Weight (lb)	Total	Orient. Factor	Elev. (ft)	K_A (Ant.)	Ice Thickness (in)	K_{zt}	EPA Bare (ft^2)	EPA Ice (ft^2)	Σ Wt. Bare (lb)	Σ Wt. Ice (lb)
Powerwave 7770	55.0	11.0	5.0	F	35.0	6	0.76	170.0	0.75	2.36	1.00	19.3	23.6	210	1358
EMS RR90-17-02DP	56.0	8.0	2.8	F	13.5	3	0.63	159.0	0.80	2.34	1.00	6.9	8.7	41	489
Commscope LNX-6515DS	96.0	11.9	7.1	F	43.7	3	0.68	159.0	0.80	2.34	1.00	18.6	21.8	131	1156
Andrew Smart Bias Tee	5.6	3.7	2.0	F	1.8	3	1.00	159.0	0.80	2.34	1.00	0.4	1.2	5	50
Ericsson KRY112 71	15.0	12.0	3.8	F	19.6	3	1.00	159.0	0.80	2.34	1.00	3.6	5.1	59	261
KMW AM-X-CD-16-65-00T	72.0	11.8	5.9	F	48.5	2	0.66	170.0	0.75	2.36	1.00	8.2	9.7	97	618
Powerwave LGP21401	14.4	13.9	3.8	F	31.0	12	0.64	170.0	0.75	2.36	1.00	9.6	13.2	372	1266
Ericsson RRUs11	17.8	17.3	2.0	F	50.0	6	0.57	170.0	0.75	2.36	1.00	6.6	8.5	300	937
Commscope SBNH-1D6565C	96.4	11.9	7.1	F	62.0	1	1.00	170.0	0.75	2.36	1.00	8.6	10.1	62	408
Ericsson RRUS-12	20.4	18.5	7.5	F	50.0	3	0.80	170.0	0.75	2.36	1.00	5.7	7.1	150	527
Raycap DC6-48-60-18-F	24.0	11.0	11.0	R	31.8	1	1.00	170.0	0.75	2.36	1.00	1.0	1.5	32	124
										0.00	1.00	0.0	0.0	0	0
										0.00	1.00	0.0	0.0	0	0
										0.00	1.00	0.0	0.0	0	0
										0.00	1.00	0.0	0.0	0	0

Mount (Type)	C_AA_C Bare (ft^2)	C_AA_C Ice (ft^2)	Weight Bare (lb)	Weight Ice (lb)	K_A (Mnt.)	Σ EPA Bare (ft^2)	Σ EPA Ice (ft^2)	K_Z	Q_Z Bare (psf)	Q_Z Ice (psf)	F_A Bare (lb)	F_A Ice (lb)	Σ Wt. Bare (lb)	Σ Wt. Ice (lb)
Sector Frame	40.3	50.0	1200.0	1518.0	0.75	49.5	61.0	1.150	43.70	6.99	2379	469	1410	2876
Low Profile Platform	26.1	31.6	1500.0	1700.0	1.00	33.0	40.3	1.128	42.87	6.86	1554	304	1541	2189
						18.6	21.8	1.128	42.87	6.86	877	164	131	1156
						0.4	1.2	1.128	42.87	6.86	20	9	5	50
						3.6	5.1	1.128	42.87	6.86	170	38	59	261
						8.2	9.7	1.150	43.70	6.99	395	75	97	618
						9.6	13.2	1.150	43.70	6.99	462	102	372	1266
						6.6	8.5	1.150	43.70	6.99	317	65	300	937
						8.6	10.1	1.150	43.70	6.99	413	77	62	408
						5.7	7.1	1.150	43.70	6.99	272	55	150	527
						1.0	1.5	1.150	43.70	6.99	46	12	32	124
						0.0	0.0	0.700	26.60	4.26	0	0	0	0
						0.0	0.0	0.700	26.60	4.26	0	0	0	0
						0.0	0.0	0.700	26.60	4.26	0	0	0	0
						0.0	0.0	0.700	26.60	4.26	0	0	0	0

Site Number: 116-23148
Site Name: Wilmington CT
Engineer: FAN
Date: 11/13/16
Code Input: TIA-222-G

Tower Section Properties

Elevation (Top of Section) (ft)	ϕ_{Bottom} (in)	F_y (psi)	P.W. (in)	P.W. F / R	W_{Coax} (lb/ft)	Thk. (in)	R_a	Inertia (in^4)	Area (in^2)	S (in^3)	Z (in^3)	D/t	w/t	F'_y (psi)	W.F. (in)
5.67	58.00	65000	0.00	R	19.7	0.3750	0.000	28765	68.6	976.8	NA	154.7	27.3	69324	10.2
11.33	56.80	65000	0.00	R	19.7	0.3750	0.000	27011	67.2	936.6	NA	151.5	26.7	69985	10.0
17.00	55.61	65000	0.00	R	19.7	0.3750	0.000	25331	65.7	897.2	NA	148.3	26.1	70646	9.8
22.67	54.41	65000	0.00	R	19.7	0.3750	0.000	23722	64.3	858.7	NA	145.1	25.6	71308	9.6
28.33	53.22	65000	0.00	R	19.7	0.3750	0.000	22182	62.9	821.0	NA	141.9	25.0	71969	9.4
34.00	52.02	65000	0.00	R	19.7	0.3750	0.000	20710	61.5	784.1	NA	138.7	24.5	72630	9.2
39.67	50.83	65000	0.00	R	19.7	0.3750	0.000	19305	60.0	748.1	NA	135.5	23.9	73291	9.0
45.33	49.63	65000	0.00	R	19.7	0.3750	0.000	17965	58.6	712.9	NA	132.4	23.3	73952	8.8
51.00	49.25	65000	0.00	R	19.7	0.3750	0.000	17553	58.2	702.0	NA	131.3	23.2	74162	8.7
56.67	48.05	65000	0.00	R	19.7	0.3750	0.000	16294	56.7	667.9	NA	128.1	22.6	74824	8.5
62.33	46.86	65000	0.00	R	19.7	0.3750	0.000	15097	55.3	634.6	NA	125.0	22.0	75487	8.3
68.00	45.66	65000	0.00	R	19.7	0.3750	0.000	13959	53.9	602.2	NA	121.8	21.5	76149	8.1
73.67	44.46	65000	0.00	R	19.7	0.3750	0.000	12881	52.5	570.6	NA	118.6	20.9	76812	7.8
79.33	43.26	65000	0.00	R	19.7	0.3750	0.000	11859	51.0	539.9	NA	115.4	20.3	77474	7.6
85.00	42.06	65000	0.00	R	19.7	0.3750	0.000	10893	49.6	510.0	NA	112.2	19.8	78137	7.4
90.67	41.52	65000	0.00	R	19.7	0.3125	0.000	8768	40.9	415.9	NA	132.9	23.4	73843	7.3
96.33	40.33	65000	0.00	R	19.7	0.3125	0.000	8026	39.7	392.0	NA	129.0	22.8	74638	7.1
102.00	39.13	65000	0.00	R	19.7	0.3125	0.000	7326	38.5	368.8	NA	125.2	22.1	75433	6.9
107.67	37.93	65000	0.00	R	19.7	0.3125	0.000	6669	37.3	346.3	NA	121.4	21.4	76228	6.7
113.33	36.73	65000	0.00	R	19.7	0.3125	0.000	6052	36.1	324.5	NA	117.5	20.7	77023	6.5
119.00	35.53	65000	0.00	R	19.7	0.3125	0.000	5474	34.9	303.4	NA	113.7	20.1	77818	6.3
124.67	34.34	65000	0.00	R	19.7	0.3125	0.000	4934	33.7	283.0	NA	109.9	19.4	78613	6.1
130.33	33.14	65000	0.00	R	19.7	0.3125	0.000	4431	32.6	263.4	NA	106.0	18.7	79408	5.8
136.00	32.49	65000	0.00	R	19.7	0.2500	0.000	3358	25.6	203.6	NA	130.0	22.9	74448	5.7
141.67	31.30	65000	0.00	R	19.7	0.2500	0.000	2999	24.6	188.8	NA	125.2	22.1	75437	5.5
147.33	30.11	65000	0.00	R	19.7	0.2500	0.000	2667	23.7	174.5	NA	120.4	21.2	76426	5.3
153.00	28.91	65000	0.00	R	19.7	0.2500	0.000	2360	22.7	160.8	NA	115.7	20.4	77414	5.1
158.67	27.72	65000	0.00	R	19.7	0.2500	0.000	2078	21.8	147.6	NA	110.9	19.6	78403	4.9
164.33	26.82	65000	0.00	R	9.8	0.2500	0.000	1879	21.1	138.0	NA	107.3	18.9	79154	4.7
170.00	24.41	65000	0.00	R	9.8	0.2500	0.000	1413	19.2	114.0	NA	97.6	17.2	81152	4.3

Site Number: 116-23148
Site Name: Wilmington CT
Engineer: FAN
Date: 11/13/16
Code Input: TIA-222-G

Shaft Wind, Ice and Dead Design Loads

Elevation (Top of Section) (ft)	$\phi_{Average}$ (in)	# of Sides	C_f Bare	C_f Ice	K_z	K_{zt}	Ice Thickness (in)	Shaft EPA (ft^2)	Q_z Bare (psf)	Q_z Ice (psf)	F_{ST} Bare (lb)	F_{ST} Ice (lb)	Wt. Bare (lb)	Wt. Ice (lb)
5.67	58.29	18	0.65	1.20	0.70	1.00	1.56	27.52	26.60	4.26	523	163	1434	2082
11.33	57.07	18	0.65	1.20	0.70	1.00	1.75	26.95	26.60	4.26	513	161	1407	2118
17.00	55.86	18	0.65	1.20	0.70	1.00	1.84	26.38	26.60	4.26	502	158	1379	2113
22.67	54.65	18	0.65	1.20	0.70	1.00	1.90	25.81	26.60	4.26	491	155	1352	2096
28.33	53.43	18	0.65	1.20	0.70	1.00	1.95	25.23	26.60	4.26	480	152	1324	2072
34.00	52.22	18	0.65	1.20	0.71	1.00	1.99	24.66	26.91	4.31	475	151	1297	2043
39.67	51.00	18	0.65	1.20	0.74	1.00	2.02	24.09	28.23	4.52	486	155	1269	2012
45.33	49.79	18	0.65	1.20	0.77	1.00	2.05	23.51	29.41	4.71	494	158	1242	1978
51.00	49.40	18	0.65	1.20	0.80	1.00	2.08	23.33	30.48	4.88	508	163	1233	1974
56.67	48.19	18	0.65	1.20	0.83	1.00	2.10	22.76	31.46	5.03	512	164	1206	1937
62.33	46.97	18	0.65	1.20	0.85	1.00	2.12	22.18	32.38	5.18	513	165	1178	1899
68.00	45.75	18	0.65	1.20	0.87	1.00	2.14	21.61	33.23	5.32	513	166	1151	1861
73.67	44.54	18	0.65	1.20	0.90	1.00	2.16	21.03	34.03	5.44	512	166	1123	1821
79.33	43.32	18	0.65	1.20	0.92	1.00	2.18	20.46	34.79	5.57	509	165	1096	1781
85.00	42.11	18	0.65	1.20	0.93	1.00	2.19	19.88	35.50	5.68	505	165	1068	1740
90.67	41.56	18	0.65	1.20	0.95	1.00	2.21	19.62	36.19	5.79	508	166	900	1568
96.33	40.34	18	0.65	1.20	0.97	1.00	2.22	19.05	36.84	5.89	502	165	877	1531
102.00	39.12	18	0.65	1.20	0.99	1.00	2.23	18.48	37.46	5.99	495	163	854	1493
107.67	37.91	18	0.65	1.20	1.00	1.00	2.25	17.90	38.06	6.09	487	161	831	1455
113.33	36.69	18	0.65	1.20	1.02	1.00	2.26	17.33	38.64	6.18	479	159	808	1417
119.00	35.47	18	0.65	1.20	1.03	1.00	2.27	16.75	39.20	6.27	469	156	785	1378
124.67	34.26	18	0.65	1.20	1.05	1.00	2.28	16.18	39.73	6.36	460	154	762	1339
130.33	33.04	18	0.65	1.20	1.06	1.00	2.29	15.60	40.25	6.44	449	151	739	1299
136.00	32.39	18	0.65	1.20	1.07	1.00	2.30	15.29	40.76	6.52	446	150	605	1157
141.67	31.18	18	0.65	1.20	1.09	1.00	2.31	14.72	41.24	6.60	434	147	587	1122
147.33	29.97	18	0.65	1.20	1.10	1.00	2.32	14.15	41.72	6.67	422	144	568	1086
153.00	28.76	18	0.65	1.20	1.11	1.00	2.33	13.58	42.18	6.75	410	141	550	1051
158.67	27.54	18	0.65	1.20	1.12	1.00	2.34	13.01	42.63	6.82	396	137	532	1015
164.33	26.01	18	0.65	1.20	1.13	1.00	2.34	12.28	43.06	6.89	378	132	462	922
170.00	23.56	18	0.65	1.20	1.14	1.00	2.35	11.13	43.49	6.96	346	123	425	847

Site Number:	116-23148	F_a:	1.60	S_A / k_e:	1.98
Site Name:	Wilmington CT	F_v:	2.40	W_u:	0 lb
Engineer:	FAN	S_{DS}:	0.18	W_t:	33203 lb
Date:	11/13/16	S_{D1}:	0.10	V_S:	980 lb
Code Input:	TIA-222-G	f_1:	0.44 Htz		
		R:	1.5		

Shaft and Appurtenance Seismic Design Loads

Elevation (Top of Section) (ft)	Weight Section (lb)	Σ Weight Appurt. (lb)	Vertical Force Dist.	Lateral Seismic Force (lb)
5.67	1434	0	0.00	0
11.33	1407	0	0.00	1
17.00	1379	0	0.00	1
22.67	1352	0	0.00	2
28.33	1324	0	0.00	3
34.00	1297	0	0.00	5
39.67	1269	0	0.01	6
45.33	1242	0	0.01	8
51.00	1233	0	0.01	10
56.67	1206	0	0.01	12
62.33	1178	0	0.01	14
68.00	1151	0	0.02	16
73.67	1123	0	0.02	19
79.33	1096	0	0.02	21
85.00	1068	0	0.02	23
90.67	900	0	0.02	22
96.33	877	0	0.03	25
102.00	854	0	0.03	27
107.67	831	0	0.03	29
113.33	808	0	0.03	31
119.00	785	0	0.03	33
124.67	762	0	0.04	36
130.33	739	0	0.04	38
136.00	605	0	0.03	34
141.67	587	0	0.04	35
147.33	568	0	0.04	37
153.00	550	0	0.04	39
158.67	2268	1735.8	0.17	171
164.33	462	0	0.04	37
170.00	2848	2422.8	0.25	246

Unfactored Tower Loads & Deflections

Site Number: 116-23148
Site Name: Wilmington CT
Engineer: FAN
Date: 11/13/16
Code Input: TIA-222-G

	Dead Load + Wind Load							Dead Load + Wind Load + Ice Load						
Elevation (ft)	Weight (lb)	Shear (lb)	$M_{Lateral}$ (lb-ft)	$M_{P\Delta}$ (lb-ft)	M_{Total} (lb-ft)	Δ (in)	θ (Degrees)	Weight (lb)	Shear (lb)	$M_{Lateral}$ (lb-ft)	$M_{P\Delta}$ (lb-ft)	M_{Total} (lb-ft)	Δ (in)	θ (Degrees)
0.0	33203	21120	2294945	62606	2357551	0.0	0.00	58619	6025	612926	33191	646117	0.0	0.00
5.7	31769	20596	2176974	62403	2239377	0.1	0.07	56536	5862	579245	33095	612340	0.0	0.02
11.3	30363	20083	2061938	61819	2123757	0.3	0.20	54418	5702	546482	32816	579297	0.1	0.05
17.0	28984	19582	1949776	60885	2010661	0.7	0.34	52305	5544	514620	32368	546988	0.2	0.09
22.7	27632	19091	1840426	59632	1900059	1.3	0.47	50209	5389	483646	31764	515410	0.3	0.13
28.3	26308	18611	1733827	58092	1791918	2.0	0.61	48138	5236	453542	31018	484560	0.5	0.17
34.0	25011	18137	1629931	56293	1686224	2.9	0.75	46095	5086	424296	30143	454439	0.8	0.20
39.7	23741	17650	1528757	54267	1583024	3.9	0.89	44083	4931	395917	29152	425069	1.1	0.24
45.3	22499	17156	1430362	52045	1482407	5.2	1.03	42105	4773	368425	28058	396483	1.4	0.28
51.0	21266	16648	1334808	49665	1384472	6.6	1.17	40131	4610	341842	26881	368722	1.8	0.32
56.7	20060	16136	1242144	47158	1289302	8.1	1.31	38194	4445	316186	25632	341818	2.2	0.35
62.3	18882	15622	1152386	44550	1196936	9.8	1.44	36295	4280	291464	24324	315788	2.7	0.39
68.0	17731	15109	1065537	41868	1107406	11.7	1.58	34434	4114	267681	22969	290649	3.2	0.43
73.7	16608	14597	981593	39138	1020730	13.7	1.72	32613	3948	244837	21577	266414	3.7	0.46
79.3	15512	14088	900540	36382	936922	15.9	1.86	30832	3783	222931	20160	243091	4.3	0.50
85.0	14444	13584	822358	33620	855978	18.3	2.00	29092	3618	201961	18725	220686	4.9	0.54
90.7	13544	13076	747046	30833	777879	20.9	2.15	27524	3452	181927	17269	199196	5.6	0.57
96.3	12667	12574	674593	28039	702632	23.6	2.31	25993	3288	162829	15800	178630	6.4	0.61
102.0	11814	12079	604965	25260	630225	26.5	2.46	24500	3125	144659	14329	158988	7.1	0.65
107.7	10983	11592	538118	22518	560636	29.6	2.62	23045	2964	127407	12866	140272	8.0	0.69
113.3	10175	11113	474009	19834	493842	32.9	2.77	21628	2805	111060	11420	122480	8.8	0.73
119.0	9389	10644	412586	17227	429812	36.4	2.91	20250	2649	95606	10001	105607	9.7	0.77
124.7	8627	10184	353795	14717	368512	40.0	3.05	18912	2495	81031	8617	89649	10.7	0.80
130.3	7888	9735	297578	12318	309896	43.8	3.19	17612	2344	67320	7275	74596	11.7	0.83
136.0	7283	9290	243897	10005	253902	47.7	3.33	16455	2194	54463	5972	60435	12.7	0.87
141.7	6696	8856	192708	7791	200500	51.9	3.47	15334	2047	42449	4712	47161	13.8	0.90
147.3	6128	8433	143946	5696	149641	56.1	3.59	14247	1903	31260	3506	34766	14.9	0.93
153.0	5578	8024	97539	3734	101273	60.5	3.69	13196	1762	20877	2362	23239	16.0	0.95
158.7	5046	7627	53416	1923	55339	65.0	3.77	12181	1625	11280	1286	12567	17.2	0.97
164.3	2848	4629	25252	887	26139	69.5	3.82	7603	978	5194	607	5801	18.3	0.98
170.0	2423	4283	0	0	0	74.1	3.84	6756	855	0	0	0	19.5	0.99

Unfactored Tower Loads & Deflections

Site Number: 116-23148
Site Name: Wilmington CT
Engineer: FAN
Date: 11/13/16
Code Input: TIA-222-G

	Dead Load + Seismic Load							Dead Load + Operational Wind Load						
Elevation (ft)	Weight (lb)	Shear (lb)	$M_{Lateral}$ (lb-ft)	$M_{P\Delta}$ (lb-ft)	M_{Total} (lb-ft)	Δ (in)	θ (Degrees)	Weight (lb)	Shear (lb)	$M_{Lateral}$ (lb-ft)	$M_{P\Delta}$ (lb-ft)	M_{Total} (lb-ft)	Δ (in)	θ (Degrees)
0.0	33203	980	129369	4949	134318	0.0	0.00	33203	4866	528755	14424	543180	0.0	0.00
5.7	31769	980	123815	4936	128751	0.0	0.00	31769	4745	501575	14378	515952	0.0	0.02
11.3	30363	979	118263	4899	123162	0.0	0.01	30363	4627	475071	14243	489314	0.1	0.05
17.0	28984	978	112717	4838	117554	0.0	0.02	28984	4512	449228	14028	463256	0.2	0.08
22.7	27632	976	107180	4755	111935	0.1	0.03	27632	4399	424034	13739	437773	0.3	0.11
28.3	26308	973	101658	4653	106311	0.1	0.04	26308	4288	399474	13384	412858	0.5	0.14
34.0	25011	968	96159	4532	100691	0.2	0.04	25011	4179	375536	12970	388506	0.7	0.17
39.7	23741	962	90691	4394	95085	0.2	0.05	23741	4067	352226	12503	364729	0.9	0.21
45.3	22499	954	85263	4241	89504	0.3	0.06	22499	3953	329555	11991	341546	1.2	0.24
51.0	21266	944	79885	4075	83960	0.4	0.07	21266	3836	307540	11443	318982	1.5	0.27
56.7	20060	932	74568	3898	78466	0.5	0.08	20060	3718	286190	10865	297055	1.9	0.30
62.3	18882	918	69325	3712	73037	0.6	0.09	18882	3599	265510	10264	275774	2.3	0.33
68.0	17731	902	64167	3518	67685	0.7	0.09	17731	3481	245500	9646	255146	2.7	0.36
73.7	16608	883	59108	3317	62425	0.8	0.10	16608	3363	226159	9017	235176	3.2	0.40
79.3	15512	862	54162	3111	57272	0.9	0.11	15512	3246	207484	8382	215867	3.7	0.43
85.0	14444	839	49341	2901	52241	1.1	0.12	14444	3130	189471	7746	197217	4.2	0.46
90.7	13544	817	44649	2686	47335	1.2	0.13	13544	3013	172119	7104	179223	4.8	0.50
96.3	12667	792	40092	2466	42558	1.4	0.14	12667	2897	155426	6460	161886	5.4	0.53
102.0	11814	765	35680	2244	37923	1.6	0.15	11814	2783	139384	5820	145204	6.1	0.57
107.7	10983	736	31426	2020	33446	1.8	0.16	10983	2671	123982	5188	129171	6.8	0.60
113.3	10175	705	27343	1797	29140	2.0	0.17	10175	2561	109212	4570	113781	7.6	0.64
119.0	9389	671	23444	1575	25019	2.2	0.17	9389	2452	95060	3969	99029	8.4	0.67
124.7	8627	636	19741	1356	21097	2.4	0.18	8627	2346	81514	3391	84905	9.2	0.70
130.3	7888	598	16246	1140	17386	2.6	0.19	7888	2243	68562	2838	71400	10.1	0.74
136.0	7283	564	12952	927	13880	2.8	0.20	7283	2140	56194	2305	58499	11.0	0.77
141.7	6696	529	9854	718	10572	3.1	0.21	6696	2040	44400	1795	46195	11.9	0.80
147.3	6128	492	6961	513	7474	3.3	0.21	6128	1943	33165	1312	34477	12.9	0.83
153.0	5578	454	4281	315	4596	3.6	0.22	5578	1849	22473	860	23333	13.9	0.85
158.7	5046	283	2194	161	2355	3.9	0.22	5046	1757	12307	443	12750	15.0	0.87
164.3	2848	246	696	51	747	4.1	0.22	2848	1067	5818	204	6023	16.0	0.88
170.0	2423	0	0	0	0	4.4	0.22	2423	987	0	0	0	17.1	0.89

Load Combinations and Combined Strength Ratios, Monopole

Site Number:	116-23148
Site Name:	Wilmington CT
Engineer:	FAN
Date:	11/13/16
Code Input:	TIA-222-G

LC = Strength Limit State Load Combinations (TIA-222-G, 2.3.2)

LC1:	1.2 D + 1 W
LC2:	0.9 D + 1 W
LC3:	1.2 D + 1.0 W_i + 1.0 D_i
LC4:	1.2 D + 1.0 E
LC5:	0.9 D + 1.0 E

Design Strength of Structural Steel (TIA-222-G, 4.7 & 4.8)

P_n = F'_y x A

V_n = 0.5 F'_y x A

M_n = F'_y x S or F'_y * Z

Elevation	**Axial**			**Shear**			**Moment**			**$\phi_c P_n$**	**$\phi_v V_n$**	**$\phi_f M_n$**	**Combined Strength Ratio**				
	D		**D_i**	**W**	**E**	**W_i**	**W**	**E**	**W_i**				**LC1**	**LC2**	**LC3**	**LC4**	**LC5**
LF / ϕ	**1.2**	**0.9**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**0.9**	**0.9**	**0.9**					
(ft)	**(k)**						**(k-ft)**			**(k)**		**(k-ft)**					
0.0	39.8	29.9	25.4	21.1	1.0	6.0	2358	134	646	4279	2140	5079	0.47	0.47	0.14	0.04	0.03
5.7	38.1	28.6	24.8	20.6	1.0	5.9	2239	129	612	4230	2115	4916	0.46	0.46	0.14	0.04	0.03
11.3	36.4	27.3	24.1	20.1	1.0	5.7	2124	123	579	4180	2090	4754	0.46	0.45	0.14	0.03	0.03
17.0	34.8	26.1	23.3	19.6	1.0	5.5	2011	118	547	4128	2064	4592	0.45	0.44	0.13	0.03	0.03
22.7	33.2	24.9	22.6	19.1	1.0	5.4	1900	112	515	4074	2037	4431	0.44	0.43	0.13	0.03	0.03
28.3	31.6	23.7	21.8	18.6	1.0	5.2	1792	106	485	4018	2009	4271	0.43	0.43	0.13	0.03	0.03
34.0	30.0	22.5	21.1	18.1	1.0	5.1	1686	101	454	3961	1980	4112	0.42	0.42	0.12	0.03	0.03
39.7	28.5	21.4	20.3	17.7	1.0	4.9	1583	95	425	3902	1951	3954	0.41	0.41	0.12	0.03	0.03
45.3	27.0	20.2	19.6	17.2	1.0	4.8	1482	90	396	3883	1941	3904	0.39	0.38	0.11	0.03	0.03
51.0	25.5	19.1	18.9	16.6	0.9	4.6	1384	84	369	3822	1911	3748	0.38	0.37	0.11	0.03	0.03
56.7	24.1	18.1	18.1	16.1	0.9	4.4	1289	78	342	3759	1879	3593	0.37	0.36	0.11	0.03	0.03
62.3	22.7	17.0	17.4	15.6	0.9	4.3	1197	73	316	3694	1847	3439	0.35	0.35	0.10	0.03	0.03
68.0	21.3	16.0	16.7	15.1	0.9	4.1	1107	68	291	3627	1814	3287	0.34	0.34	0.10	0.03	0.02
73.7	19.9	14.9	16.0	14.6	0.9	3.9	1021	62	266	3559	1780	3137	0.33	0.33	0.10	0.03	0.02
79.3	18.6	14.0	15.3	14.1	0.9	3.8	937	57	243	3489	1745	2989	0.32	0.32	0.09	0.02	0.02
85.0	17.3	13.0	14.6	13.6	0.8	3.6	856	52	221	2717	1358	2303	0.38	0.38	0.11	0.03	0.03
90.7	16.3	12.2	14.0	13.1	0.8	3.5	778	47	199	2666	1333	2194	0.36	0.36	0.10	0.03	0.03
96.3	15.2	11.4	13.3	12.6	0.8	3.3	703	43	179	2614	1307	2086	0.34	0.34	0.10	0.03	0.02
102.0	14.2	10.6	12.7	12.1	0.8	3.1	630	38	159	2560	1280	1980	0.32	0.32	0.09	0.02	0.02
107.7	13.2	9.9	12.1	11.6	0.7	3.0	561	33	140	2504	1252	1875	0.30	0.30	0.08	0.02	0.02
113.3	12.2	9.2	11.5	11.1	0.7	2.8	494	29	122	2447	1223	1771	0.28	0.28	0.08	0.02	0.02
119.0	11.3	8.5	10.9	10.6	0.7	2.6	430	25	106	2388	1194	1669	0.26	0.26	0.07	0.02	0.02
124.7	10.4	7.8	10.3	10.2	0.6	2.5	369	21	90	2327	1163	1569	0.24	0.24	0.07	0.02	0.02
130.3	9.5	7.1	9.7	9.7	0.6	2.3	310	17	75	1714	857	1137	0.28	0.28	0.08	0.02	0.02
136.0	8.7	6.6	9.2	9.3	0.6	2.2	254	14	60	1673	836	1068	0.24	0.24	0.07	0.02	0.02
141.7	8.0	6.0	8.6	8.9	0.5	2.0	200	11	47	1629	815	1000	0.21	0.20	0.06	0.02	0.01
147.3	7.4	5.5	8.1	8.4	0.5	1.9	150	7	35	1585	792	934	0.17	0.16	0.05	0.01	0.01
153.0	6.7	5.0	7.6	8.0	0.5	1.8	101	5	23	1538	769	868	0.12	0.12	0.04	0.01	0.01
158.7	6.1	4.5	7.1	7.6	0.3	1.6	55	2	13	1502	751	819	0.07	0.07	0.02	0.01	0.01
164.3	3.4	2.6	4.8	4.6	0.2	1.0	26	1	6	1400	700	694	0.04	0.04	0.01	0.00	0.00
170.0	2.9	2.2	4.3	4.3	0.0	0.9	0	0	0	1400	700	694	0.00	0.00	0.01	0.00	0.00

Foundation Capacity

Job Number:	**116-23148**
Site Name:	**Wilmington CT**
Engineer:	**FAN**
Date:	**11/13/2016**
Code Input:	**TIA-222-G**

Rock Anchor Design

Factored Moment:	2357.6	k-ft
Factored Shear:	21.1	k
Factored Compression:	39.8	k

Tower Anchor Bolt Circle:	65.0	in	Concrete Breaking Strength:	3000	psi
Caisson Square Length:	14.0	ft	Clear Cover:	3.0	in
Caisson Height Above Grade:	0.5	ft	Horizontal Bar #:	8	
Caisson Depth Below Grade:	5.5	ft	# of Horizontal Bars, One Way:	14	
Williams Rod Minimum Yield Strength:	120	ksi	Rebar Yield Strength:	60	ksi
Williams Rod Ultimate Strength:	150	ksi	ϕ_v:	0.75	
Williams Rod Diameter:	1.75	in	ϕ_v:	0.90	
Williams Rod Net Area:	2.60	in^2	β:	0.85	
Rock Anchor Circle:	120.00	in	Rebar Tension Area:	11.1	in^2
# of Rock Anchors:	8				
Rock Anchor Embedment (Including Free Stress Length):	33.0	ft			
Free Stress Length:	11.0	ft			
Concrete Unit Weight:	150	pcf			
Soil Unit Weight:	135	pcf			
Ultimate Bond Strength:	150	psi			
Cored Hole Diameter:	4.00	in			
Pullout Angle:	40	Degrees			
Proof Load:	320	k			
Limit Capacity to Proof Load:	Yes				
Rock Anchor Yield / Plastic Design:	Yield				

Rock Anchor Material and Soil Strength

Williams Rod Ultimate Tensile Strength:	390.0	k
Breakout Weight of Single Anchor:	5680.3	k
Bond Strength of a Single Anchor:	497.6	k
Ultimate Tension Resistance of a Single Anchor:	320.0	k
Ultimate Moment Resistance from Rock Anchors:	13120.0	k-ft
Caisson Weight:	176.4	k
Ultimate Moment Resistance from Concrete and Tower Weight:	1513.7	k-ft
Design Moment:	2484.3	k-ft
Σ Ultimate Moment Resistance:	11353.7	k-ft
Usage, Overturning:	0.22	OK

Anchor Bolt and Baseplate Capacities

Job Number:	**116-23148**
Site Name:	**Wilmington CT**
Engineer:	**FAN**
Date:	**11/13/2016**
Code Input:	**TIA-222-G**

Base Plate and Bolt Analysis

Moment:	2357.6	k-ft
Shear/Leg:	21.1	k
Compression/Leg:	39.8	k

Assumptions

Weld Strength is 70 ksi

Maximum Bolt / Stiffener Ratio is 2/1

TIA-222 Code Revision (F/G):	G		Stiffener Height along Pole:		in
Lower Monopole Shaft Diameter:	58.0	in	Stiffener Length along Plate:		in
Lower Monopole Thickness:	0.375	in	Stiffener Thickness:		in
Base Plate Thickness:	2.25	in	# of Stiffeners:		
Base Plate Yield Strength:	50	ksi	Stiffener Yield Strength:		ksi
Fillet Weld Size:	0.375	in	Chamfer:		in
Weld Type (PP/F or F/F):	PP/F				
Anchor Bolt Yield Strength:	150	ksi			
Anchor Bolt Ultimate Strength:	125	ksi			
Anchor Bolt Diameter:	2.25	in	Angle:	0.0	Degrees
Anchor Bolt Circle:	65.00	in	Effective Stiffener Area:	0.00	in^2
# of Anchor Bolts:	18		Stiffener Strength Capacity:	0.0	k
Stress Increase:	1.00		Stiffener Moment Capacity:	0.0	k-in
Concrete Strength:	3000	psi			
Foundation Diameter:	6.00	ft			

Start Angle:	180.0	Degrees
Area:	63.2	in^2
Centriod from Center of Pole:	0.00	in
Inertia:	30873.3	in^4
Section Modulus, Tension:	949.9	in^3
Section Modulus, Compression:	949.9	in^3
Area of Bolt:	3.25	in^2
Inertia of Bolt:	0.84	in^4
Bolt Tension:	94.5	k
Bolt Shear:	0.2	k
Tensile Bolt Capacity:	311.8	k
Shear Bolt Capacity:	140.3	k
Interaction Equation:	0.30	Result: OK

Moment Arm:	2.375	in
Moment in Plate:	224.5	k-in
Baseplate Effective Width:	10.12	in
Section / Plastic Modulus:	12.81	in^3
Plate Moment Capacity:	576.5	k-in
Interaction Equation:	0.39	Result: OK

DOCKET NO. 267 - Cordless Data Transfer, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites at Turnpike Road, Map 45-Lot 4, Willington, Connecticut. } } }

Connecticut
Siting
Council
February 3, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to Cordless Data Transfer, Inc. for the construction, maintenance and operation of a wireless telecommunications facility at the prime site on Turnpike Road, Map 45-Lot 4, Willington, Connecticut. The Council denies certification of the alternate site.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless PCS LLC and other entities, both public and private, but such tower shall not exceed a total height of 170 feet above ground level.

2. The tower enclosure shall be moved approximately 25 feet to the southeast. Development of the site shall not disturb the intermittent watercourse (wetland drain) adjacent to the site.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) a detailed site development plan that depicts the location of the access road, compound, tower, utility line, erosion and sedimentation control features, extent of site clearing and grading, and landscaping. Erosion and sedimentation controls shall be consistent with the <u>2002 Connecticut Guidelines for Soil Erosion and Sediment Control</u>, as amended; and
    b) specifications for the tower, tower foundation, antennas, equipment building, and security fence.

4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case

TOWN OF WILLINGTON BUILDING PERMIT

A PERMIT MUST BE OBTAINED AND FEE PAID BEFORE BEGINNING WORK.
SEPARATE PERMITS AND FEES ARE REQUIRED FOR **PLUMBING-HEATING-ELECTRICAL**

Town of Willington
40 Old Farms Road
Willington, CT 06279

DATE: JUNE 21, 2005

OFFICE HOURS: MONDAY 12:30 PM - 7:30 PM
TUESDAY - FRIDAY 9:00 AM - 2:00 PM

PERMIT #: 0605-64

ESTIMATED COST* $ 39,000 (*Building Inspector may demand affidavit of actual cost) Fee Paid $ 390.00

MAP # ______ LOT # ______ ZONE ______ WORKER'S COMPENSATION/INSURANCE AFFIDAVIT ATTACHED ✓

LOCATION OF JOB: ~~35~~ 47 TURNPIKE ROAD

BUILDING OWNER: CORDLESS DATA TRANSFER, INC TEL(S) 860 729-9399

ADDRESS: 600 OLD HARTFORD ROAD CITY, STATE & ZIP: COLCHESTER, CT 06415

NAME OF APPLICANT: CINGULAR WIRELESS TEL(S) 860 513-7792

ADDRESS: 500 ENTERPRISE DRIVE CITY, STATE & ZIP: ROCKY HILL, CT 06067

NAME OF BUILDER: SBA NETWORK SERVICES, INC. TEL(S) 860 659-9101

ADDRESS: 80 EASTERN BLVD. CITY, STATE & ZIP: GLASTONBURY, CT 06033

CONTRACTOR'S REGISTRATION #: 901026 **MODEL ENGERY CODE** (if applicable) ______

PURPOSE OF PERMIT:

TYPE OF BUILDING:
Residential ____ Commercial X Other ______

sq. ft. 1st floor: ______ sq. ft. 2nd floor: ______
sq. ft. garage: ______ sq. ft. 2nd floor: ______
sq. ft. deck(s): ______ sq. ft. porch(s): ______

TYPE OF JOB:
X Original Constr. ____ Repair ____ Pool AG IG
____ Alteration ____ Siding ____ Demolition
____ Addition ____ Roofing ____ Relocation
____ chimney ____ woodstove and furnance - 2 flues
____ fireplace ____ 2 fireplaces and 1 flue
____ other: ______

Complete the following or attach complete plans

Member	Size	Material or Species	Longest Span	Center
Girder				
Outside Stud				
Bearing Stud				
1st Floor Joist				
2nd Floor Joist				
Rafter				
Ceiling Joist				

Truss Documents Included ______

DESCRIPTION OF PROPOSED WORK: INSTALLATION OF CINGULAR WIRELESS TELECOMMUNICATIONS FACILITY TO INCLUDE BUT NOT LIMITED TO SHELTER W/FOUNDATION, ELECTRIC & TELCO SERVICE AND ANTENNAS & COAXIAL CABLE.

All work covered by this application has been authorized by the (owner) and/or (agent) of this property and will be done according to the laws and building regulations of the State of Connecticut, Basic Building Code. A final inspection is required before the building can be occupied or a Certificate of Use or Occupancy is issued.

APPLICANT'S SIGNATURE: [signature] DATE: JUNE 21, 2005

BUILDING DEPARTMENT DECISION

TYPE OF CONSTRUCTION: ______ X APPROVED ____ DENIED

INSPECTOR'S SIGNATURE: Edward F. [signature] DATE: 6-24-05

Rev. 10/2004

Call when approved - will pick up

30.00

State Fee $	~~10.00~~ 30.00
Appl. Fee $	30.00
Total Fee $	60.00

APPLICATION FOR CERTIFICATE OF ZONING COMPLIANCE

COMPLETE BOXED AREA. TYPE OR PRINT ONLY.

Date JUNE 21, 2005

Location of Property 47 ~~45~~ TURNPIKE ROAD

Name and Address of Owner CORDLESS DATA TRANSFER, INC.

600 OLD HARTFORD RD. COLCHESTER, CT Zip 06415 Tel. # 860 729-9399

Name and Address of Applicant CINGULAR WIRELESS

500 ENTERPRISE DR. ROCKY HILL, CT Zip 06067 Tel. # 860 513-7792

Zoning District ______ Map # ______ Lot # ______ Lot Area ______ Lot Frontage ______

FOR: [X] - New Construction [ ] - Addition [ ] - Accessory Building

[ ] - Change of Use [ ] - Swimming Pool [ ] A/G [ ] I/G

[ ] - Other (describe) ______

USE: [ ] - Single Family Residence [ ] - Multi-Family Residence

[X] - Commercial [ ] - Industrial

[ ] - Other (describe) ______

PROPOSED STRUCTURE:

Description INSTALLATION OF CINGULAR WIRELESS TELECOMMUNICATIONS FACILITY PER CONSTRUCTION DRAWINGS.

Dimensions ______ Height ______ (ft.)

Livable Floor Area: 1st Floor ______ 2nd Floor ______ Total ______

Name of S & E Contact Person ED DUPONT Tel. # 860 670-2811

PERMIT VOID IF WORK OR ACTIVITY IS NOT COMPLETED WITHIN ONE YEAR OF THE DATE OF ISSUANCE.

This permit, if issued, is based upon the information submitted. Falsification, by misrepresentation or omission, or failure to comply with the conditions of approval of this permit shall constitute a violation of the Willington Zoning Regulations.

______ **SIGNATURE OF OWNER**

[signature] **AUTHORIZED REPRESENTATIVE**

CERTIFICATE OF ZONING COMPLIANCE PERMIT HEREBY: ISSUED - [✓] DENIED - [ ]

BY: S Yorgensen **DATE** 6-23-05

CONDITIONS Per Siting Council approval

______

______

______ **Initial here** ______

[ ] **SPECIAL PERMIT** [ ] **SITE PLAN APPROVAL** [ ] **ZBA VAR #** ______ **DATE** ______

HEALTH DEPARTMENT APPROVAL ______ **DATE** ______

Rev. 5/2001

modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

5. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided tower space is available and such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes **§** 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in <u>The Hartford Courant</u> and <u>The Chronicle</u>.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant Cordless Data Transfer, Inc.	**Its Representative** Charles Andres, Esq. Tyler Cooper & Alcorn, LLP 205 Church Street P.O. Box 1936 New Haven, Connecticut 06509-1910 Robert J. Francis, President Cordless Data Transfer, Inc. P.O. Box 363 17 Ridgewood Drive Marlborough, Connecticut 06447
Intervenor AT&T Wireless PCS, LLC d/b/a AT&T Wireless	**Its Representative** Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, New York 10601

47 TURNPIKE RD

Location	47 TURNPIKE RD	**Assessment**	$263,080
Mblu	45/ / 004-00/ /	**Appraisal**	$549,410
Acct#	00007400	**PID**	2535
Owner	BARBER WILLIAM R & HAZEL M	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$144,060	$405,350	$549,410
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$24,800	$238,280	$263,080

Owner of Record

Owner	BARBER WILLIAM R & HAZEL M	**Sale Price**	$0
Co-Owner		**Certificate**	1
Address	88 SLATER RD TOLLAND, CT 06084	**Book & Page**	80/195
		Sale Date	05/15/1980

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	

Building Photo

(http://images.vgsi.com/photos/WillingtonCTPhotos//\00\00\26,

Building Layout

Building Layout

Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplaces	
Basement Garage	

Building Sub-Areas	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 6100
Description FOREST
Zone DI
Neighborhood 302
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 13.91
Frontage
Depth
Assessed Value $238,280
Appraised Value $405,350

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV2	PAVING-CONC			400.00 S.F.	$990	1
SHD2	W/LIGHTS ETC			96.00 S.F.	$780	1
TOW1	TOWER			170.00 UNITS	$142,290	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$144,060	$322,770	$466,830

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$24,800	$180,470	$205,270