



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

June 23, 2017

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

RE: Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 876313
AT&T Site ID: CT5264
500 Queen St, Southington, CT 06489
Latitude: 41° 37' 48.54"/ Longitude: -72° 52' 29.98"

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at the 78-foot level of the existing 82-foot monopole tower at 500 Queen St in Southington, CT. The tower is owned by Crown Castle. The property is owned by RAP Properties LLC. An easement has been granted to Crown Castle for this location, the deed is attached. AT&T now intends to replace three (3) antennas with three (3) new antennas, and s. These antennas would be installed at the 78-foot level of the tower. AT&T also intends replace three (3) TMAs with three (3) new TMAs, replace six (6) lines of coax, and install three (3) additional TMAs.

This facility was approved by the by the Connecticut Siting Council on January 22, 2009. This approval was given without conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Garry Brumback, Town Manager, Town of Southington, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Garry Brumback, Town Manager
Town of Southington
75 Main Street
Southington, CT 06489

Planning and Zoning
Municipal Center
196 North Main Street
Southington, CT 06489

RAP Properties LLC
82 Barkledge Court
Cheshire, CT 06410

Petition No. 880
AT&T
500 Queen Street, Southington
Draft Staff Report
January 22, 2009

New Cingular Wireless PCS, LLC (AT&T) previously maintained a 74-foot guyed lattice tower attached to an automobile business at 500 Queen Street, Southington. The building is to be removed, and the site will be developed as a new pharmacy. In the Connecticut Siting Council (Council) Petition No. 862, AT&T was granted approval to install an 85-foot temporary monopole in the southwest corner of the lot to facilitate site development.

In lieu of a temporary monopole, AT&T was granted administrative approval for a cell on wheels facility (COW) with a total height of approximately 85 feet. Per Council conditions of the earlier approval, one year was allowed for the COW to be installed, and a maximum of six months of operation was permitted. The COW was activated on December 12, 2008 and may be operational up to June 12, 2009.

On December 17, 2008, the Council received a Petition (Petition) for a declaratory ruling that no Certificate is required for a proposed permanent facility at this site. This Petition is designated as Petition No. 880. On January 12, 2008, this Petition was field reviewed by Council member Ed Wilensky and Michael Perrone of the Council staff. Attorney Lucia Chiochio of Cuddy & Feder LLP (representing AT&T) also attended the field review.

Specifically, AT&T seeks to install a permanent 82-foot flagpole without a flag. This tower would contain three internal panel antennas and six internal tower mounted amplifiers centered at the 79-foot level of the tower. AT&T would be the only carrier at this time. A 12-foot by 26-foot equipment shelter would be located inside a 30-foot by 30-foot fenced compound. The site would use the same access as the pharmacy. No new access would be required.

The site is commercial in nature and is bordered by Interstate 84 to the west and north, a hotel and restaurant to the east, and an automobile dealership to the south. Given the nature of the surrounding area, visibility is not expected to be significant. In fact, visibility from Queen Street (Route 10) is expected to decrease because the permanent facility would be located in the rear corner of the lot, farther away from Queen Street than the original facility.

There are no wetlands at the site, and the site is already disturbed with pavement.

At the field review, Council staff inquired about the tower setback radius. The proposed tower would be 72 feet from the southern property line. Thus, the tower setback radius would extend approximately 10 feet onto the auto dealership property. No buildings are located within the setback radius. AT&T would like to use a tower from its existing inventory. As such, it would not have a yield point design because it was not contemplated at the time of construction.

Prepared out of state.

Return to:

Parcel ID: 169001

GRANT OF EASEMENT AND ASSIGNMENT OF LEASE

Facilities: 852873
Street Address: 500 Queen Street
City: Southington
County: Hartford
State: Connecticut

between

GLOBAL SIGNAL ACQUISITIONS IV LLC,
a Delaware limited liability company ("Grantee")

and

RAP PROPERTIES, LLC,
a Connecticut limited liability company ("Grantor")

GRANT OF EASEMENT AND ASSIGNMENT OF LEASE

THIS GRANT OF EASEMENT AND ASSIGNMENT OF LEASE (the "Easement") is made effective this 26th day of JUNE, 2015, by and between RAP PROPERTIES, LLC, a Connecticut limited liability company ("Grantor"), and GLOBAL SIGNAL ACQUISITIONS IV LLC, a Delaware limited liability company ("Grantee").

1. Description of Grantor's Property. Grantor is the owner of that certain land and premises located in Southington, County of Hartford, State of Connecticut, by grant or conveyance described in the Hartford County Land Records ("Land Records") in Book 804, Page 218. The description of said property is attached hereto as Exhibit "A" (hereinafter "Grantor's Property").

2. Description of Easement. For \$10.00 and other good and valuable consideration, the receipt and sufficiency of which the parties hereby acknowledge, Grantor grants and conveys unto Grantee, its successors and assigns, forever, an exclusive, perpetual easement for the use of a portion of Grantor's Property, that portion being approximately 900 square feet and shown as the "Tower Easement" in the survey attached hereto as Exhibit "B" and described as the "Tower Easement" by metes and bounds in Exhibit "C" attached hereto (the "Easement Area"). The Easement Area shall also include (a) a perpetual right-of-way for ingress and egress, seven days per week, twenty-four hours per day, on foot or motor vehicle, including trucks, along a twenty foot (20') wide right-of-way together with the right to install, replace and maintain above and below ground utility wires, poles, cables, fiber, conduit and pipes as more fully shown as the "Access/Utility Easement" on Exhibit "B" and described as the "Access/Utility Easement" on Exhibit "C", and a utility easement, together with the right to install, replace and maintain above and below ground utility wires, poles, cables, fiber, conduit and pipes in a location more fully shown as the "Utility Easement" on Exhibit "B" and described as the "Utility Easement" on Exhibit "C"; and (b) any portion of Grantor's Property on which communications facilities exist on the date of this Easement (even if not described in the Lease Agreement as that term is defined in Section 3 of this Easement). In the event Grantee or any public utility is unable or unwilling to use the easement described in subsection (a) above, Grantor hereby agrees to grant an additional right-of-way, in form satisfactory to Grantee, to Grantee or at Grantee's request, directly to a public utility, at no cost and in a location acceptable to Grantee.

3. Assignment of Lease Agreement. The parties hereby acknowledge that certain Lease Agreement dated August 31, 2001, originally by and between AT&T Wireless PCS, LLC, a Delaware limited liability company, d/b/a AT&T Wireless, as lessee ("Lessee"), and Grantor, as lessor (the "Lease Agreement") attached hereto as Exhibit "D". As used herein, the term "Lease Agreement" shall include any amendments or addendums to said agreement. Grantor warrants that Grantor has delivered to Grantee true and correct copies of the Lease Agreement. To Grantor's best knowledge, no party to the Lease Agreement has breached or is in default of their respective obligations under the Lease Agreement and no party has requested or discussed a modification of the Lease Agreement (including a reduction in rent) or termination now or in the future. Grantor hereby assigns to Grantee Grantor's right, title and interest in the Lease Agreement, including but not limited to (a) all rents, security deposits and other monies due or to become due to Grantor pursuant to the Lease Agreement; (b) the right to amend any and all terms of the Lease Agreement; (c) the right to extend the length of the term of the Lease Agreement;

and (d) the right to increase the size of the area subject to the Lease Agreement so long as any such expansion is within the Easement Area. Grantee assumes the obligations and liabilities of Grantor, as lessor under the Lease Agreement accruing after the date of this Easement, but only to the extent that such obligations and liabilities are not the responsibility of Grantor pursuant to the terms of this Easement.

4. Grantor's Obligations with Respect to the Lease Agreement. From and after the date hereof and continuing until this Easement is terminated (if ever), Grantor shall not, other than to the extent required herein or requested in writing by Grantee, exercise or enjoy any of the rights or remedies of the lessor under the Lease Agreement. Grantor shall notify Grantee in writing within five (5) calendar days of Grantor's receipt of any payment in respect of rent, income, charges, interest, penalties, fees and other revenue payable by the Lessee, and Grantor shall forward such payment to Grantee within said five (5) day period. In the event that Grantor fails to forward to Grantee any payment as provided hereunder, Grantee shall have the right to collect such payment from Grantor together with interest on such payment at the greater of the (i) the rate provided by statute where the Easement Area is located or (ii) 12% per annum (calculated from the date five (5) days after Grantor receives such payment until Grantor pays such sums due to Grantee) and shall have a lien against Grantor's Property with respect thereto. Grantor shall, however, continue to pay, perform, and otherwise discharge all obligations and liabilities of the lessor under the Lease Agreement with respect to Grantor's Property, whether arising prior to, on, or after the date hereof. Without limiting the generality of the foregoing, Grantor shall: (a) fully, faithfully and timely perform all covenants to be performed by the Grantor under the Lease Agreement; (b) promptly pay all mortgages, loans, liens, judgments and all real estate, personal income and other taxes that may become due with respect to Grantor's Property; (c) promptly execute, without any additional consideration, all letters of authorizations, permits, applications or other documents required for Grantee to fully enjoy the Easement or the Lease Agreement; (d) not suffer or allow any breach, default or event of default by the Grantor to occur under the Lease Agreement; and (e) not take any action for the purpose of, or with the effect of, inducing or causing the Lessee not to exercise a right to renew or extend the Lease Agreement. Failure to comply, in whole or in part with this Section shall constitute a default by Grantor of the terms hereof and entitle Grantee to the remedies provided in Section 14 of this Easement.

5. Permitted Uses. The Easement Area shall be used for constructing, maintaining and operating communications facilities and energy generation facilities for energy to be used on and off the Easement Area, including without limitation, tower structures, antenna support structures, cabinets, meter boards, buildings, antennas, cables, equipment and uses incidental thereto including those necessary for Grantee's compliance with its obligations under the Lease Agreement (the "Permitted Use"). No facilities or structures installed or constructed on the Easement Area by Grantee shall constitute a fixture, but shall remain the personal property of Grantee. Grantor acknowledges that Grantor has no right to object to or approve any improvements to be constructed on the Easement Area. If requested by Grantee, Grantor will execute, at Grantee's sole cost and expense, all documents required by any governmental authority in connection with any development of, or construction on, the Easement Area, including documents necessary to petition the appropriate public bodies for certificates, permits, licenses and other approvals deemed necessary by Grantee in Grantee's absolute discretion to utilize the Easement Area for the Permitted Use. Grantor agrees to be named applicant if requested by Grantee. In furtherance of the foregoing, Grantor hereby appoints Grantee as

Grantor's attorney-in-fact to execute all land use applications, permits, licenses and other approvals on Grantor's behalf, provided that Grantee's actions as attorney-in-fact for Grantor shall be in connection with Grantee's Permitted Use of the Easement Area and at no cost to Grantor. Grantor shall be entitled to no further consideration with respect to any of the foregoing matters. Grantor shall take no action that would adversely affect the status of the Easement Area with respect to the Permitted Use.

6. **Perpetual Easement.** This Easement and Grantee's rights and privileges hereunder shall be perpetual and may be terminated only as provided for herein.

7. **Grantee's Right to Terminate.** Grantee shall have the unilateral right, but not the obligation, to terminate this Easement for any reason. Upon termination of this Easement, (i) if the Lease Agreement is then in effect, the rights and obligations as lessor under the Lease Agreement shall revert to Grantor and (ii) the parties shall have no further obligations to each other; provided, however, that if Grantee installed any buildings, structures or equipment upon the Easement Area, Grantee shall, within a reasonable time, remove all of its building(s), tower and above ground property and restore the surface of the Easement Area to its original condition prior to any such installment, reasonable wear and tear excepted. Any buildings, structures or equipment installed or constructed upon the Easement Area by Lessee, or those holding by, through and under Lessee, shall be subject to the terms and conditions of the Lease Agreement. Said termination shall be effective upon Grantee providing written notice of termination to Grantor.

8. **Hazardous Materials.**

(a) For purposes of this Easement, the term "Hazardous Materials" means any substance which is (i) designated, defined, classified or regulated as a hazardous substance, hazardous material, hazardous waste, pollutant or contaminant under any Environmental Law, as currently in effect or as hereafter amended or enacted, (ii) a petroleum hydrocarbon, including crude oil or any fraction thereof and all petroleum products, (iii) PCBs, (iv) lead, (v) asbestos, (vi) flammable explosives, (vii) infectious materials, or (viii) radioactive materials. "Environmental Law(s)" means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601, et seq., the Resource Conservation and Recovery Act of 1976, 42 U.S.C. Sections 6901, et seq., the Toxic Substances Control Act, 15 U.S.C. Sections 2601, et seq., the Hazardous Materials Transportation Act, 49 U.S.C. 5101, et seq., and the Clean Water Act, 33 U.S.C. Sections 1251, et seq., as said laws have been supplemented or amended to date, the regulations promulgated pursuant to said laws and any other federal, state or local law, statute, rule, regulation or ordinance which regulates or proscribes the use, storage, disposal, presence, clean-up, transportation or release or threatened release into the environment of Hazardous Materials.

(b) Grantee shall not (either with or without negligence) cause or permit the use, storage, generation, escape, disposal or release of any Hazardous Materials in any manner not sanctioned by law. In all events, Grantee shall indemnify and hold Grantor harmless from any and all claims, damages, fines, judgments, penalties, costs, liabilities or losses (including, without limitation, any and all sums paid for

settlement of claims, attorneys' fees, and consultants' and experts' fees) arising from the presence or release of any Hazardous Materials on the Easement Area if caused by Grantee or persons acting under Grantee.

- (c) Grantor shall not (either with or without negligence) cause or permit the use, storage, generation, escape, disposal or release of any Hazardous Materials in any manner not sanctioned by law. In all events, Grantor shall indemnify and hold Grantee harmless from any and all claims, damages, fines, judgments, penalties, costs, liabilities or losses (including, without limitation, any and all sums paid for settlement of claims, attorneys' fees, and consultants' and experts' fees) arising from the presence or release of any Hazardous Materials on Grantor's Property unless caused by Grantee or persons acting under Grantee. Grantor shall execute such affidavits, representations and the like from time to time as Grantee may reasonably request concerning Grantor's best knowledge and belief as to the presence of Hazardous Materials on Grantor's Property.
- (d) To the best of Grantor's knowledge and belief, neither the Easement Area nor Grantor's Property is in violation of or subject to any existing, pending, or threatened investigation or inquiry by any governmental authority or subject to any remedial obligations under any applicable laws pertaining to Hazardous Materials.

9. Insurance. During the term of this Easement, Grantee shall carry, at no cost to Grantor, adequate commercial general liability insurance with limits of not less than \$1,000,000.00 per occurrence. Grantor hereby agrees that Grantee may satisfy this requirement pursuant to master policies of insurance covering other locations of Grantee. Grantee shall provide evidence of such insurance such evidence shall name Grantor and, upon request, Grantor's lender as an additional insured.

10. Maintenance. Grantor shall maintain the Grantor's Property in a good and safe condition except (i) the exclusive portion of the Easement Area, and (ii) to the extent maintenance is the obligation of the Lessee under the Lease Agreement.

11. Removal of Obstructions. Grantee has the right to remove obstructions, including but not limited to vegetation, which may encroach upon, interfere with or present a hazard to Grantee's or Lessee's use of the Easement Area. Grantee shall be responsible for disposing of any materials related to the removal of obstructions.

12. Taxes. Grantor acknowledges and agrees that a portion of the Purchase Price is for and in consideration of the continuing obligation of Grantor to pay, on or before the due date all present and future real property taxes, transfer taxes, penalties, interest, roll-back or additional taxes, sales and use taxes and all other fees and assessments, regardless of the taxing method that are attributable to Grantor's Property. Grantee agrees to reimburse Grantor the real property taxes attributable to the Easement Area, provided they are not already paid pursuant to the Lease Agreement. Grantor shall provide a copy of all tax bills and proof of payment of said tax bills to Grantee. In the event that Grantor fails to pay all taxes on Grantor's Property prior to such taxes becoming delinquent, Grantee may, at its option, pay such taxes (the "Delinquent Taxes") and Grantee shall have the right to collect the Delinquent Taxes from Grantor together with interest on

the Delinquent Taxes at the greater of the (i) the rate provided by statute where the Easement Area is located or (ii) 12% per annum (calculated from the date Grantee pays the Delinquent Taxes until Grantor repays such sums due to Grantee) and shall have a lien against Grantor's Property with respect thereto. Failure of Grantor to comply, in whole or in part with this Section shall constitute a default by Grantor of the terms hereof and entitle Grantee to the remedies provided in Section 14 of this Easement.

13. **Waiver of Subrogation.** The parties hereby waive any and all rights of action for negligence against the other which may hereafter arise on account of damage to the Easement Area or any other portion of Grantor's Property, including improvements and personal property located thereon, resulting from any fire or other casualty of the kind covered by property insurance policies with extended coverage regardless of whether or not, or in what amount, such insurance is now or hereafter carried by the parties.

14. **Default.** The following shall constitute events of default by Grantor: (a) Grantor's failure to comply with any portion of this Easement; (b) failure by Grantor to forward to Grantee any payment as required in Section 4; (c) failure by Grantor to pay taxes as required in Section 12 of this Easement; (d) failure to timely pay any mortgages, loans, liens or judgments on the Grantor's Property; (e) a default of the Lease Agreement, the cure of which is solely or partially within the control of Grantor; and/or (f) any agreement, act or omission of Grantor resulting in, or likely to result in, the termination or expiration of the Lease Agreement or any other lease over the Easement Area or any portion thereof (each a "Default"). Grantee shall give Grantor written notice of a Default. After receipt of such written notice, Grantor shall have ten (10) days in which to cure any monetary Default and fifteen (15) days in which to cure any non-monetary Default. Grantor shall have a reasonable extended period as may be required beyond the fifteen (15) day cure period to cure any non-monetary Default if the nature of the cure is such that it requires additional time to cure, and Grantor commences the cure within the fifteen (15) day period and thereafter continuously and diligently pursues the cure to completion. In the event that Grantor is in default beyond the applicable period set forth above, Grantee may, at its option (i) terminate this Easement and be relieved from all further obligations under this Easement; (ii) perform the obligation(s) of Grantor in which case any expenditures made by Grantee in so doing shall be deemed paid for the account of Grantor and Grantor agrees to reimburse Grantee for said expenditures upon demand; (iii) take any actions that are consistent with Grantee's rights; (iv) sue for injunctive relief, specific performance, and damages; or (v) set-off such amounts expended against any amounts due to Grantor. In the event that any sums expended by Grantee pursuant to this Easement are not reimbursed by Grantor within thirty (30) days of demand as provided hereunder, Grantee shall have the right to collect such amounts from Grantor together with interest on such amounts at the greater of the (i) the rate provided by statute where the Easement Area is located or (ii) 12% per annum (calculated from date such amounts are expended until Grantor pays such sums due to Grantee) and shall have a lien against Grantor's Property with respect thereto. Grantor grants Grantee a lien against Grantor's Property to secure its obligations to repay Grantee for any sums expended by Grantee pursuant to this Section 14.

15. **Limitation on Damages.** In no event shall Grantee be liable to Grantor for consequential, indirect, speculative or punitive damages in connection with or arising from this

Easement, the Permitted Use or the Easement Area. Nothing in this Section shall be construed as to limit liability for direct damages caused by either party.

16. **Recording.** Grantor acknowledges that Grantee intends to record this Easement, or a memorandum of this Easement, with the appropriate recording officer upon execution of this Easement. Grantor acknowledges that Grantee may record a subsequent memorandum of this Easement within two years of the date of this Easement if, in Grantee's sole discretion, Grantee desires to record a more accurate description of the Easement Area. Grantor agrees to fully cooperate in any subsequent recordings without additional consideration.

17. **Hold Harmless.** Grantor hereby indemnifies, holds harmless, and agrees to defend Grantee against all damages asserted against or incurred by Grantee by reason of, or resulting from: (a) the breach by Grantor of, any representation, warranty, or covenant of Grantor contained herein or (b) any negligent act or omission of Grantor, excepting however such damages as may be due to or caused by the acts of Grantee or its agents. Grantee hereby indemnifies, holds harmless, and agrees to defend Grantor against all damages asserted against or incurred by Grantor by reason of, or resulting from: (a) the breach by Grantee of any representation, warranty, or covenant of Grantee contained herein or (b) any negligent act or omission of Grantee, excepting however such damages as may be due to or caused by the acts of Grantor or its agents.

18. **Grantor's Covenant of Title.** Grantor covenants: (a) Grantor is seized of fee simple title to the Grantor's Property of which the Easement Area is a part and has the right and authority to grant this Easement; (b) that this Easement is and shall be free and clear of all liens, claims, encumbrances and rights of third parties of any kind whatsoever; (c) subject to the terms and conditions of this Easement, Grantee shall have quiet possession, use and enjoyment of the Easement Area; (d) there are no aspects of title that might interfere with or be adverse to Grantee's interests in and intended use of the Easement Area; and (e) that Grantor shall execute such further assurances thereof as may be required.

19. **Non-Interference.** From and after the date hereof and continuing until this Easement is terminated (if ever), Grantor shall not permit (a) the construction, installation or operation of any communications facilities that emit radio frequencies on Grantor's Property other than communications facilities constructed, installed and/or operated on the Easement Area pursuant to this Easement or the Lease Agreement or (b) any condition on Grantor's Property which interferes with the Permitted Use. Each of the covenants made by Grantor in this Section 19 is a covenant running with the land for the benefit of the Easement Area and shall be binding upon Grantor and each successive owner of any portion of Grantor's Property and upon each person having any interest therein derived through any owner thereof.

20. **Eminent Domain.** If the whole or any part of the Easement Area shall be taken by right of eminent domain or any similar authority of law, the entire award for the value of the Easement Area and improvements so taken shall belong to Grantee.

21. **Grantor's Property.** Grantor shall not do or permit anything that will interfere with or negate any special use permit or approval pertaining to the Easement Area or cause any communications or energy facilities on the Easement Area to be in nonconformance with applicable local, state, or federal laws. Grantor covenants and agrees that it shall not subdivide the

Grantor's Property if any such subdivision will adversely affect the Easement Area's compliance (including any improvements located thereon) with applicable laws, rules, ordinances and/or zoning, or otherwise adversely affects Grantee's ability to utilize Grantor's Property for the Permitted Use. Grantor may initiate or consent to changes in the zoning of Grantor's Property so long as said zoning changes do not prevent or limit Grantee from using the Easement Area for the Permitted Use.

22. **Entire Agreement**. Grantor and Grantee agree that this Easement contains all of the agreements, promises and understandings between Grantor and Grantee. No verbal or oral agreements, promises or understandings shall be binding upon either Grantor or Grantee in any dispute, controversy or proceeding at law. Any addition, variation or modification to this Easement shall be void and ineffective unless made in writing and signed by the parties hereto.

23. **Construction of Document**. Grantor and Grantee acknowledge that this document shall not be construed in favor of or against the drafter and that this document shall not be construed as an offer until such time as it is executed by one of the parties and then tendered to the other party.

24. **Applicable Law**. This Easement and the performance thereof shall be governed, interpreted, construed and regulated by the laws of the State where the Easement Area is located. The parties agree that the venue for any litigation regarding this Easement shall be the county in which the Easement Area is located.

25. **Notices**. All notices hereunder shall be in writing and shall be given by (a) established express delivery service which maintains delivery records, (b) hand delivery, or (c) certified or registered mail, postage prepaid, return receipt requested. Notices may also be given by facsimile transmission, provided that the notice is concurrently given by one of the above methods. Notices are effective upon receipt, or upon attempted delivery if delivery is refused or if delivery is impossible because of failure to provide reasonable means for accomplishing delivery. The notices shall be sent to the parties at the following addresses:

If to Grantor:

RAP Properties, LLC
Attn: Roy Pavacich
217 Whispering Palms Lane
Bradenton, FL 34212

If to Grantee:

Global Signal Acquisitions IV LLC
c/o Crown Castle USA Inc.
E. Blake Hawk, General Counsel
Attn: Legal – Real Estate Dept.
2000 Corporate Drive
Canonsburg, PA 15317

26. **Assignment.** The parties hereto expressly intend that the easements granted herein shall be easements in gross, and as such, are transferable, assignable, inheritable, divisible and apportionable. Grantee has the right, within its sole discretion, to sell, assign, lease, convey, license or encumber any of its interest in the Easement Area without consent. In addition, Grantee has the right, within its sole discretion, to grant sub-easements over any portion of the Easement Area without consent. In connection with the foregoing, Grantor irrevocably constitutes and appoints Grantee as its true and lawful attorney-in-fact, with full power of substitution and resubstitution to negotiate and consummate subleases, licenses, sublicense or any other agreements for the use or occupancy of the Easement Area. Grantor ratifies and acknowledges the right of Grantee to enter into such agreements and Grantor will be bound by such agreements throughout and after any termination of this Easement and acknowledges that all such agreements entered into by Grantee shall survive any termination of this Easement. Any such sale, assignment, lease, license, conveyance, sub-easement or encumbrance shall be binding upon the successors, assigns, heirs and legal representatives of the respective parties hereto. An assignment of this Easement shall be effective upon Grantee sending written notice thereof to Grantor at Grantor's mailing address stated above and shall relieve Grantee from any further liability or obligation accruing hereunder on or after the date of the assignment.

27. **Partial Invalidity.** If any term of this Easement is found to be void or invalid, then such invalidity shall not affect the remaining terms of this Easement, which shall continue in full force and effect.

28. **Mortgages.** This Easement shall be subordinate to any mortgage given by Grantor which currently encumbers Grantor's Property including the Easement Area, provided that any mortgagee holding such a mortgage shall recognize the validity of this Easement in the event of foreclosure of Grantor's interest and Grantee's rights under this Easement. In the event that the Easement Area is or shall be encumbered by such a mortgage, Grantor shall obtain and furnish to Grantee a non-disturbance agreement for each such mortgage, in recordable form.

29. **Successors and Assigns.** The terms of this Easement shall constitute a covenant running with the Grantor's Property for the benefit of Grantee and its successors and assigns and shall extend to and bind the heirs, personal representatives, successors and assigns of the parties hereto and upon each person having any interest therein derived through any owner thereof. Any sale, mortgage, lease or other conveyance of Grantor's Property shall be under and subject to this Easement and Grantee's rights hereunder.

30. **Construction of Easement.** The captions preceding the Sections of this Easement are intended only for convenience of reference and in no way define, limit or describe the scope of this Easement or the intent of any provision hereof. Whenever the singular is used, the same shall include the plural and vice versa and words of any gender shall include the other gender. As used herein, "including" shall mean "including, without limitation." This document may be executed in multiple counterparts, each of which shall be deemed a fully executed original.

31. **Non-Interference with Lease Agreement.** Grantor and Grantee hereby acknowledge and agree that: (a) the terms of this Easement are not intended to cause the lessor under the Lease Agreement to be in breach thereof, and (b) Grantee's right to utilize the Easement Area for the Permitted Use is subject to all rights of Lessee as provided in the Lease Agreement while the Lease Agreement remains in full force and effect, including without limitation, Lessee's

rights, if any, to the exclusive use of the Easement Area. In the event the execution of this Easement or the terms hereof shall cause the lessor under the Lease Agreement to be in breach thereof, this Easement shall be automatically amended to the extent necessary to keep the lessor from being in breach of the Lease Agreement. In addition, in the event Grantor's assignment to Grantee of the lessor's interest in the Lease Agreement and/or the execution of this Easement would cause the lessor to be in breach of the Lease Agreement or would otherwise be prohibited under the terms of the Lease Agreement, then Grantor and Grantee agree that, at Grantee's election, any one or more of the following may occur: (1) Grantee will be Grantor's manager and operator of the Lease Agreement instead of the lessor under the Lease Agreement until such time that such assigning or granting or failing to assign or grant any right, title or interest can be effective without causing the lessor to be in breach of the Lease Agreement; (2) Grantee will receive and will be entitled to all of the revenue that Grantee would have been entitled to as lessor under the Lease Agreement and Grantor will direct, in writing, all payors of amounts due to pay such amounts to Grantee; (3) Grantor will grant Grantee a power of attorney, and will appoint Grantee as its agent and attorney to review, negotiate and execute on behalf of Grantor, in Grantee's sole discretion, all documents and instruments relating to the Lease Agreement; including but not limited to, amendments to amend any and all terms of the Lease Agreement, amendments to remove any conflicts between the Lease Agreement and this Easement, amendments to extend the length of the term of the Lease Agreement, amendments to terminate the Lease Agreement or otherwise take action or inaction that will result in the Lease Agreement expiring or terminating, and amendments to increase the size of the area subject to the Lease Agreement so long as any such expansion is within the Easement Area; and to otherwise act on behalf of Grantor in dealing with the Lease Agreement until such time that such assigning or granting or failing to assign or grant any right, title or interest can be effective without causing the lessor to be in breach of the Lease Agreement.

[Signatures appear on the following page]

IN WITNESS WHEREOF, Grantor and Grantee, having read the foregoing and intending to be legally bound hereby, have executed this Grant of Easement and Assignment of Lease as of the day and year first written above.

GRANTOR:

Signed Sealed and Delivered
in the Presence of:

[Signature]
Witness #1

[Signature]
Witness #2

RAP PROPERTIES, LLC,
a Connecticut limited liability company

By: [Signature] (SEAL)

Name: ROY A PAUPCIK
Title: MEMBER

STATE OF Florida)
COUNTY OF Manatee)

SS:

On this the 25th day of June, 2015, before me, Tasha Miller
the undersigned officer, personally appeared _____, who acknowledged
himself/herself to be the _____ of RAP Properties, LLC, a
Connecticut limited liability company, and that he/she as such _____,
being authorized so to do executed the foregoing Grant of Easement and Assignment of
Lease for the same for the purposes therein contained, by signing the name of the limited liability
company, by himself/herself as _____.

In witness whereof I hereunto set my hand.

[Signature]
Signature of notary public
Print name: Tasha Miller
Date commission expires: 4/30/16
[affix stamp or seal]

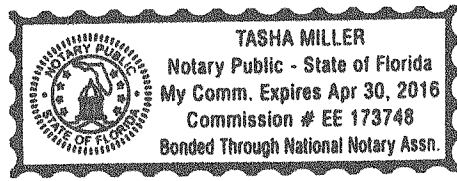


EXHIBIT A

GRANTOR'S PROPERTY

The land referred to herein below is situated in the County of Hartford, City of Southington, State of Connecticut, and is described as follows:

All that certain piece or parcel of land together with building and all other improvements thereon, located on the westerly side of Queen Street, in the Town of Southington, County of Hartford and State of Connecticut, and bounded and described as follows:

EASTERLY: on Queen Street, three hundred ninety-six (396) feet, more or less;

SOUTHERLY: on land of Buswell Metal Products, Inc., four hundred ninety and nine tenths (490.9) feet, more or less;

WESTERLY: on land now or formerly of H. J. Bradley, Inc., six and eighty-five one-hundredths (6.85) feet, more or less; and

NORTHERLY: on land of State of Connecticut, six hundred sixty (660) feet, more or less.

EXHIBIT B

SURVEY

[ATTACHED HERETO]

BOUNDARY SURVEY
 FINANCED FOR
CROWN CASTLE
 3330 TORMKIDON WAY, SUITE 300 CHARLOTTE, NC 28277
 SITE: CT251 SOUTHTONING INDUSTRIAL C
 BUN: 852873
 ADDRESS: 500 QUEEN STREET
 SOUTHTONING CT 06489
 HARTFORD COUNTY

NATIONAL SURVEY SERVICES COORDINATION BY:
GEOLINE SURVEYING, INC.
 15400 DASH 4TH FLOOR FARMINGTON, CT 06031
 860-636-1100 FAX: 860-452-9980
 WWW.GEOLINESURV.COM

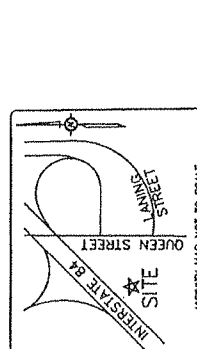
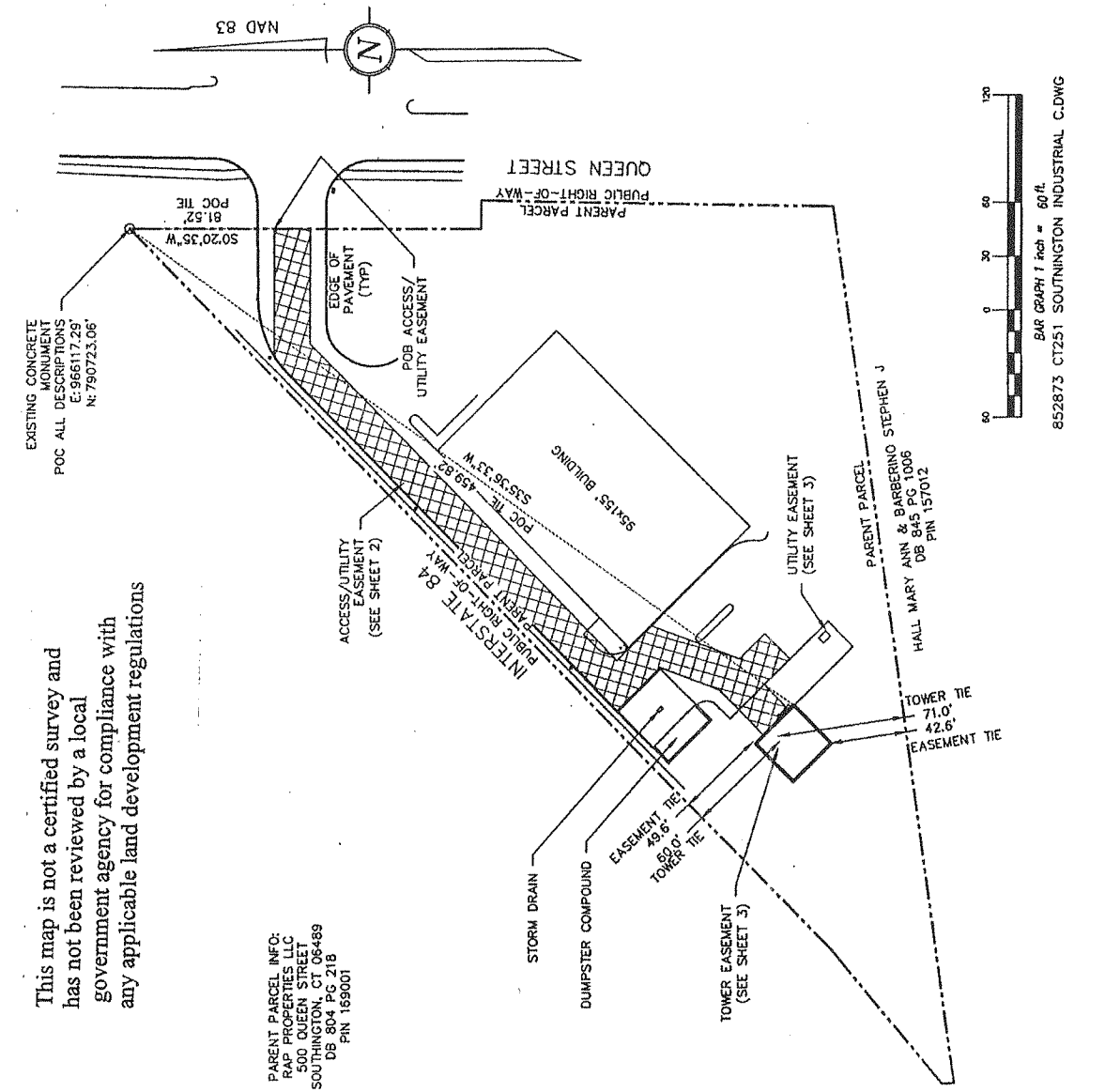
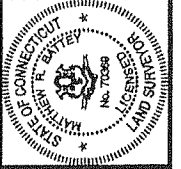
SURVEY WORK PERFORMED BY:
JONATHAN MURPHY
 Professional Land Surveying
 10200 Litchwood Place (019) 260-4189
 Raleigh, NC 27613 FAX: 919-981-1616
 Email: jmurphy@murphyland.com

SURVEYOR'S NOTES

1. BASIS OF BEARING: CT GRID 0600 ZONE NAD83
2. NO SURFACE INVESTIGATION WAS PERFORMED TO LOCATE UNDERGROUND UTILITIES, UTILITIES SHOWN HEREON ARE LIMITED TO AND ARE PER OBSERVED EVIDENCE ONLY.
3. THIS SURVEY DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT PARCEL.
4. ALL VISIBLE TOWER EQUIPMENT AND UTILITY MARKERS ARE CONTAINED WITH IN THE DESCRIBED AREA.
5. ALL SYMBOLS SHOWN ON HEREON NOT DEPICTED TO SCALE.

SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY TO CROWN CASTLE & FIDELITY NATIONAL TITLE INSURANCE COMPANY.

MURPHY GEOMATICS
Matthew R. Battey
 MATTHEW R. BATTEY
 LAND SURVEYOR -
 DATE: 5/21/2015



This map is not a certified survey and has not been reviewed by a local government agency for compliance with any applicable land development regulations

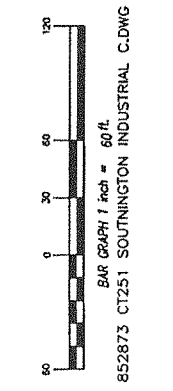
PARENT PARCEL INFO:
 RAP PROPERTIES, LLC
 500 QUEEN STREET
 SOUTHTONING, CT 06489
 DB 804 PG 218
 PIN 169001

ZONING: B, DISCOUNT STORES

THIS PARCEL OF LAND LIES WITHIN FLOOD ZONE X, WHICH IS NOT A SPECIAL FLOOD HAZARD AREA, AS SHOWN ON FLOOD PANEL NUMBER: 0500030438E
 EFFECTIVE DATE: 9/26/2008

- LEGEND**
- : SET 5/8" REBAR
 - : FOUND 1/2" REBAR AS NOTED.
 - (---) : RECORD DESCRIPTION DATA.
 - P.O.B. : POINT OF BEGINNING.
 - P.O.C. : POINT OF COMMENCEMENT.
 - : FENCE AS NOTED.
 - : OVER HEAD UTILITY LINES.
 - ⊕ : WOOD UTILITY POLE.
 - ⊞ : ELECTRIC TRANSFORMER.
 - ⊞ : TELCO PEDESTAL.
 - ⊞ : WATER METER.
 - ⊞ : CABLE TELEVISION
 - N/A : NOT AVAILABLE

AREA	SQUARE FEET	ACRE
PARENT PARCEL	95832	2.2
TOWER EASEMENT	900	0.021
TOWER COMPOUND	920	0.021
ACCESS/UTILITY EASEMENT	9257	0.21
UTILITY EASEMENT	1000	0.02



BOUNDARY SURVEY
 PREPARED FOR
CROWN CASTLE

1530 YOUNGDOWN WAY, SUITE 300 CHARLOTTE, NC 28277
 SITE: CT251 SOUTHWINGTON INDUSTRIAL C
 BUN: 852873
 ADDRESS: 500 QUEEN STREET
 SOUTHWINGTON CT 06489
 HARTFORD COUNTY
 NATIONAL SURVEY SERVICES COORDINATION ETC.

GEO LINE SURVEYING, INC.
 13430 HWY 104th Terrace, Suite A, Altamonte, FL 32715
 (407) 988-1100 FAX: (407) 988-1115
 (407) 988-1116
 (407) 988-1117
 (407) 988-1118
 (407) 988-1119
 (407) 988-1120
 (407) 988-1121
 (407) 988-1122
 (407) 988-1123
 (407) 988-1124
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 (407) 988-1129
 (407) 988-1130

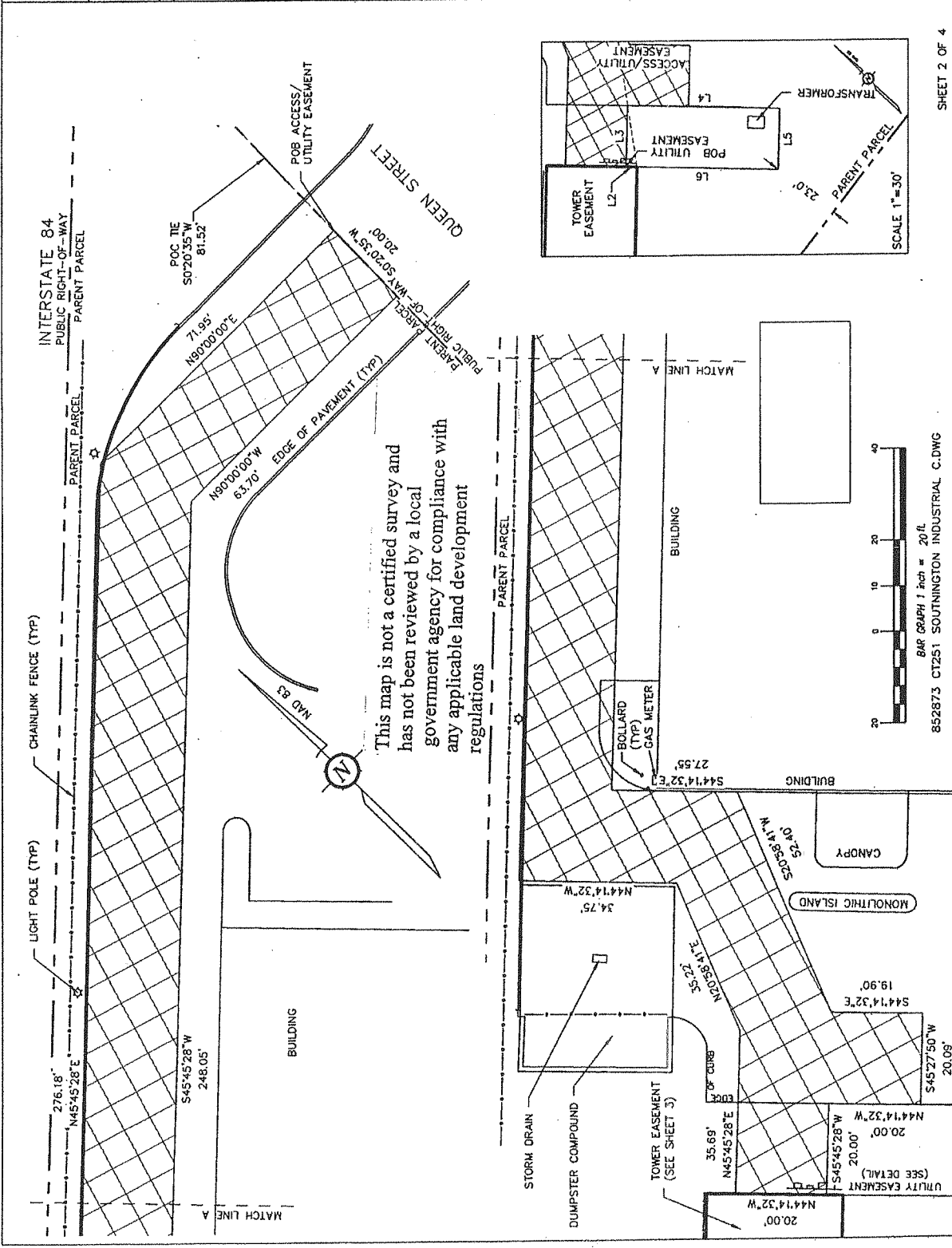
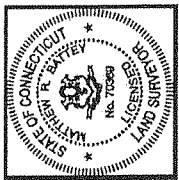
NATHAN MURPHY
 Professional Land Surveying
 101 W. 1st St. Raleigh, NC 27601
 (919) 833-2115
 (919) 833-2116
 (919) 833-2117
 (919) 833-2118
 (919) 833-2119
 (919) 833-2120
 (919) 833-2121
 (919) 833-2122
 (919) 833-2123
 (919) 833-2124
 (919) 833-2125
 (919) 833-2126
 (919) 833-2127
 (919) 833-2128
 (919) 833-2129
 (919) 833-2130

SURVEYOR'S NOTES

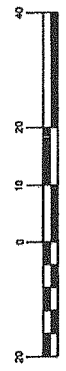
1. BASIS OF BEARING: CT GRID 0600 ZONE 14083
2. NO SUBSURFACE INVESTIGATION WAS CONDUCTED AND THEREFORE ALL UTILITIES, UNLESS SHOWN HEREON ARE LIMITED TO AND ARE PER OBSERVED EVIDENCE ONLY.
3. THIS SURVEY DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT PARCEL.
4. EXCEPT AS SHOWN, ALL VISIBLE TOWER EQUIPMENT AND IMPROVEMENTS ARE CONTAINED WITH IN THE DESCRIBED AREA.
5. ALL SYMBOLS SHOWN ON HEREON NOT DEPICTED TO SCALE.

SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY TO CROWN CASTLE & FIDELITY NATIONAL TITLE INSURANCE COMPANY.

MURPHY GEOMATICS
Matthew R. Battey
 MATTHEW R. BATTEY
 LAND SURVEYOR -
 DATE: 3/12/2015



This map is not a certified survey and has not been reviewed by a local government agency for compliance with any applicable land development regulations



BOUNDARY SURVEY
 PREPARED FOR
CROWN CASTLE

330 TORRINGTON WAY, SUITE 300 CHARLOTTE, NC 28277
 SITE: CT251 SOUTHTONING INDUSTRIAL, C
 BUN: 852873
 ADDRESS: 500 QUEEN STREET
 SOUTHTONING CT 06489
 BARTFORD COUNTY

GEOLINE SURVEYING, INC.
 1340 NW 11th Terrace, Suite A, Mishawaka, IN 46345
 (317) 281-2100
 WWW.GEOLINE.COM

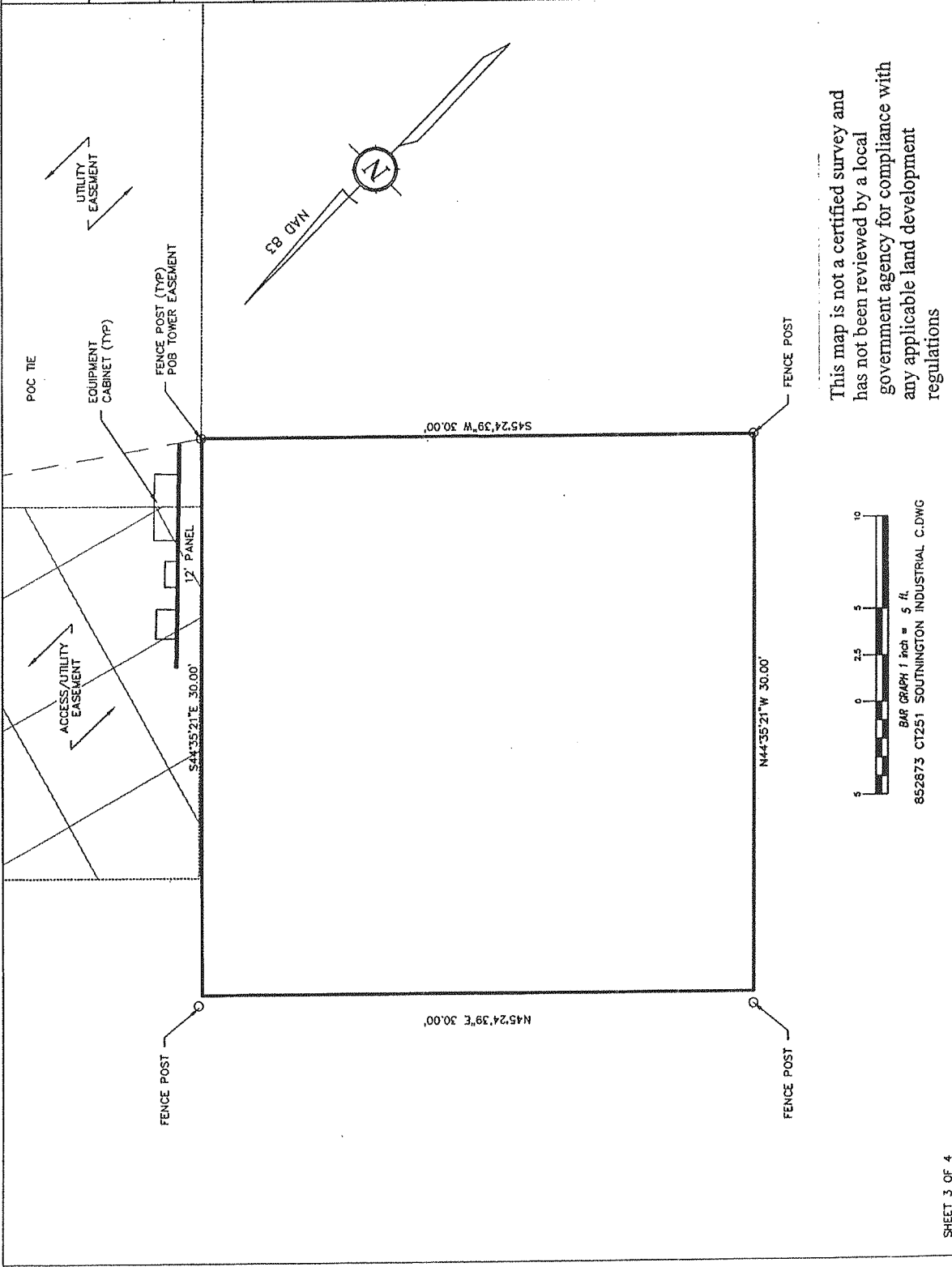
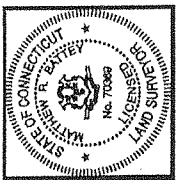
JONATHAN MURPHY
 Professional Land Surveying
 10000 Woodland Pkwy. (113) 281-2100
 Raleigh, NC 27613
 Cell: 704-998-9115
 Email: jonathan@jonathanmurphy.com

SURVEYOR'S NOTES

1. BASIS OF BEARING: CT GRID 0600 ZONE NAD83
2. NO SUBSURFACE INVESTIGATION WAS CONDUCTED. UTILITIES SHOWN HEREON ARE LIMITED TO AND ARE PER OBSERVED EVIDENCE ONLY.
3. THIS SURVEY DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT PARCEL.
4. EXCEPT AS SHOWN, ALL WESSEL TOWER EQUIPMENT AND IMPROVEMENTS ARE CONTAINED WITH IN THE DESCRIBED AREA.
5. ALL SYMBOLS SHOWN ON HEREON NOT DEPICTED TO SCALE.

SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY TO CROWN CASTLE & FIDELITY NATIONAL TITLE INSURANCE COMPANY.

MURPHY GEOMATICS
Matthew R. Baitey
 MATTHEW R. BAITEY
 LAND SURVEYOR -
 DATE: 3/12/2015



BOUNDARY SURVEY
PREPARED FOR
CROWN CASTLE

1500 TORRHOCEN WAY, SUITE 300 CHARLOTTE, NC 28277
 SITE: CT251 SOUTHWINGTON INDUSTRIAL C
 BUN: 852973
 ADDRESS: 609 QUEEN STREET
 SOUTHWINGTON, CT 06488
 HARTFORD COUNTY

NATIONAL SURVEY SERVICE CORPORATION BY:

GEOLINE SURVEYING, INC.
 13400 NW 10th Terrace, Suite A, Alachua, FL 32015
 Phone: (904) 418-0500 Fax: (904) 482-9986
 WWW.GEOSURVING.COM

SURVEY WORK PERFORMED BY:

JONATHAN MURPHY
 Professional Land Surveyor
 10000 Leewood Place (919) 290-8199
 10000 Leewood Place (919) 290-8199
 10000 Leewood Place (919) 290-8199
 10000 Leewood Place (919) 290-8199

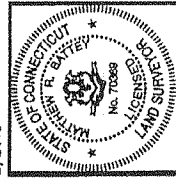
SURVEYOR'S NOTES

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2. NO SUBSURFACE INVESTIGATION WAS PERFORMED TO LOCATE UNDERGROUND UTILITIES. ANY UTILITIES ARE LIMITED TO AND ARE PER OBSERVED EVIDENCE ONLY.
3. THIS SURVEY DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARENT PARCEL.
4. EXCEPT AS SHOWN, ALL VISIBLE TOWER EQUIPMENT AND IMPROVEMENTS ARE CONTAINED WITH IN THE DESCRIBED AREA.
5. ALL SYMBOLS SHOWN ON HEREON NOT DEPICTED TO SCALE.

SURVEYOR'S CERTIFICATION
 I HEREBY CERTIFY TO CROWN CASTLE & FIDELITY NATIONAL TITLE INSURANCE COMPANY.

MURPHY GEOMATICS

Matthew R. Battey
 MATTHEW R. BATTEY
 LAND SURVEYOR -
 DATE: 3/12/2015



LEGAL DESCRIPTION: TOWER EASEMENT (CREATED BY THIS OFFICE)
 A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHWINGTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:
 COMMENCING FROM AN EXISTING CONCRETE MONUMENT, FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E966.117.29' AND N 790.723.06', THENCE ALONG SAID RIGHT OF WAY, S 00° 20' 35" W FOR A DISTANCE OF 459.82 FEET TO THE POINT OF BEGINNING; THENCE S 45° 24' 39" W FOR A DISTANCE OF 30.00 FEET TO A POINT; THENCE N 44° 35' 21" W FOR A DISTANCE OF 30.00 FEET TO THE POINT OF BEGINNING; THENCE N 45° 24' 39" E FOR A DISTANCE OF 30.00 FEET TO A POINT; THENCE S 44° 35' 21" E FOR A DISTANCE OF 30.00 FEET TO THE POINT OF BEGINNING, CONTAINING 900 SQFT AND BEING THE SAME PARCEL OF LAND DESCRIBED AS THE CELL TOWER LEASE PARCEL IN THAT NOTICE OF LEASE DATED 10/14/08 AND RECORDED ON 10/16/08 IN BOOK 1141, PAGES 1049-1047.

LEGAL DESCRIPTION: ACCESS/UTILITY EASEMENT (CREATED BY THIS OFFICE)
 A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHWINGTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:
 COMMENCING FROM AN EXISTING CONCRETE MONUMENT, FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E966.117.29' AND N 790.723.06', THENCE ALONG SAID RIGHT OF WAY, S 00° 20' 35" W FOR A DISTANCE OF 81.52 FEET TO THE POINT OF BEGINNING; THENCE S 45° 24' 39" W FOR A DISTANCE OF 63.70 FEET TO A POINT; THENCE S 44° 14' 32" E FOR A DISTANCE OF 248.05 FEET TO A POINT; THENCE S 44° 14' 32" E FOR A DISTANCE OF 27.55 FEET TO A POINT; THENCE S 20° 58' 41" W FOR A DISTANCE OF 52.40 FEET TO A POINT; THENCE S 44° 14' 32" E FOR A DISTANCE OF 19.90 FEET TO A POINT; THENCE S 45° 27' 50" W FOR A DISTANCE OF 20.09 FEET TO A POINT; THENCE N 44° 14' 32" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE S 45° 27' 50" W FOR A DISTANCE OF 20.00 FEET TO A POINT ON A TOWER EASEMENT; THENCE ALONG SAID TOWER EASEMENT, N 44° 14' 32" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE N 44° 14' 32" W FOR A DISTANCE OF 35.89 FEET TO A POINT; THENCE N 20° 58' 41" E FOR A DISTANCE OF 27.61 FEET TO A POINT; THENCE N 50° 00' 00" E FOR A DISTANCE OF 7.55 FEET TO THE POINT OF BEGINNING, CONTAINING 9257 SQUARE FEET AND 0.21 ACRES.

LEGAL DESCRIPTION: UTILITY EASEMENT (CREATED BY THIS OFFICE)
 A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHWINGTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:
 COMMENCING FROM AN EXISTING CONCRETE MONUMENT, FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E966.117.29' AND N 790.723.06', THENCE ALONG SAID RIGHT OF WAY, S 00° 20' 35" W FOR A DISTANCE OF 159.83 FEET TO THE POINT OF BEGINNING; THENCE N 45° 28' 28" E FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE S 44° 14' 32" E FOR A DISTANCE OF 50.00 FEET TO THE POINT OF BEGINNING; THENCE N 45° 28' 28" E FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE S 44° 14' 32" E FOR A DISTANCE OF 50.00 FEET TO THE POINT OF BEGINNING, CONTAINING 1000 SQFT AND 0.02 ACRES.

EXHIBIT C

Page 1 of 2

TOWER EASEMENT

A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHLINGTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:

COMMENCING FROM AN EXISTING CONCRETE MONUMENT, FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E:966,117.29' -AND- N: 790,723.06'; THENCE DEPARTING SAID RIGHT OF WAY, S 35° 36' 33" W FOR A DISTANCE OF 459.82 FEET TO THE POINT OF BEGINNING; THENCE, S 45° 24' 39" W FOR A DISTANCE OF 30.00 FEET TO A POINT; THENCE, N 44° 35' 21" W FOR A DISTANCE OF 30.00 FEET TO A POINT; THENCE, N 45° 24' 39" E FOR A DISTANCE OF 30.00 FEET TO A POINT; THENCE, S 44° 35' 21" E FOR A DISTANCE OF 30.00 FEET TO THE POINT OF BEGINNING, CONTAINING 900 SQFT AND BEING THE SAME PARCEL OF LAND DESCRIBED AS THE CELL TOWER LEASE PARCEL IN THAT NOTICE OF LEASE DATED 10/14/08 AND RECORDED ON 10/16/08 IN BOOK 1141. PAGES 1043-1047.

ACCESS/UTILITY EASEMENT

A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHLINGTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:

COMMENCING FROM AN EXISTING CONCRETE MONUMENT; FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E:966,117.29' -AND- N: 790,723.06'; THENCE ALONG SAID RIGHT OF WAY, S 00° 20' 35" W FOR A DISTANCE OF 81.52 FEET TO THE POINT OF BEGINNING; THENCE ALONG SAID RIGHT OF WAY, S 00° 20' 35" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE DEPARTING SAID RIGHT OF WAY, N 90° 00' 00" W FOR A DISTANCE OF 63.70 FEET TO A POINT; THENCE, S 45° 45' 28" W FOR A DISTANCE OF 248.05 FEET TO A POINT; THENCE, S 44° 14' 32" E FOR A DISTANCE OF 27.55 FEET TO A POINT; THENCE, S 20° 58' 41" W FOR A DISTANCE OF 52.40 FEET TO A POINT; THENCE, S 44° 14' 32" E FOR A DISTANCE OF 19.90 FEET TO A POINT; THENCE, S 45° 27' 50" W FOR A DISTANCE OF 20.09 FEET TO A POINT; THENCE, N 44° 14' 32" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE, S 45° 45' 28" W FOR A DISTANCE OF 20.00 FEET TO A POINT ON A TOWER EASEMENT; THENCE ALONG SAID TOWER EASEMENT, N 44° 14' 32" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE DEPARTING SAID TOWER EASEMENT, N 45° 45' 28" E FOR A DISTANCE OF 35.69 FEET TO A POINT; THENCE, N 20° 58' 41" E FOR A DISTANCE OF 35.22 FEET TO A POINT; THENCE, N 44° 14' 32" W FOR A DISTANCE OF 34.75 FEET TO A POINT; THENCE, N 45° 45' 28" E FOR A DISTANCE OF 276.18 FEET TO A POINT; THENCE, N 90° 00' 00" E FOR A DISTANCE OF 71.95 FEET TO THE POINT OF BEGINNING, CONTAINING 9257 SQUARE FEET AND- 0.21 ACRES.

EXHIBIT C

Page 2 of 2

UTILITY EASEMENT

A PORTION OF THAT CERTAIN PARCEL OF LAND LYING IN THE CITY OF SOUTHTON, COUNTY OF HARTFORD, STATE OF CONNECTICUT, DESCRIBED IN DEED BOOK 804 PAGE 218, FURTHER DESCRIBED AS:

COMMENCING FROM AN EXISTING CONCRETE MONUMENT, FOUND ON THE NORTHERN MOST CORNER OF THE PARENT PARCEL, ALSO LYING ON THE WESTERN RIGHT OF WAY OF QUEEN STREET, HAVING CONNECTICUT STATE PLANE COORDINATES E:966,117.29' -AND- N: 790,723.06'; THENCE DEPARTING SAID RIGHT OF WAY, S 35°36'33" W FOR A DISTANCE OF 459.82 FEET TO A POINT; THENCE, N 44° 14' 32" W FOR A DISTANCE OF 3.66 FEET TO THE POINT OF BEGINNING; THENCE, N 45° 45' 28" E FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE, S 44° 14' 32" E FOR A DISTANCE OF 50.00 FEET TO A POINT; THENCE, S 45° 45' 28" W FOR A DISTANCE OF 20.00 FEET TO A POINT; THENCE, N 44° 14' 32" W FOR A DISTANCE OF 50.00 FEET TO THE POINT OF BEGINNING, CONTAINING 1000 SQFT -AND- 0.02 ACRES.

EXHIBIT D
LEASE AGREEMENT
[ATTACHED HERETO]

Cell Site Number: CT-251 Address: 500 Queen Street, Southington, CT 06489

LEASE AGREEMENT

THIS LEASE AGREEMENT ("Agreement"), dated as of the date below, is entered into by RAP Properties LLC, a limited liability company with a Tax ID# of [REDACTED], having its principal office/residing at 82 Barkledge Court, Cheshire, CT 06410 (hereinafter referred to as "Landlord") and AT&T Wireless PCS LLC., a limited liability company, by and through its manager, AT&T Wireless Inc. d/b/a AT&T Wireless, having an office at 15 Midland Ave., Paramus, NJ 07652 (hereinafter referred to as "Tenant").

BACKGROUND

Landlord owns that certain plot, parcel or tract of land, together with all rights and privileges arising in connection therewith, located at 500 Queen Street, identified as Lot 14 in Map 173 in the Town of Southington, Hartford County, State of Connecticut (collectively "Property"). Tenant desires to use a portion of the Property in connection with its federally licensed communications business.

The parties agree as follows:

- LEASE OF PREMISES.** Landlord leases to Tenant portions of the Property consisting of (a) a room/cabinet space of approximately 150 square feet and (b) space on the structure and such easements as are necessary for the antennas and initial installation as described on attached Exhibit 1 (collectively, "Premises"). For the purposes of this Lease the Structure is defined as follows: a seventy foot guyed lattice tower, guyed wires- attached to the roof top of 500 Queen Street, Southington, CT.. Tenant agrees that this Lease and related easements, and Tenant's use of the Structure are on a non-exclusive basis, with Landlord reserving the right to continue to use the Structure as used prior to the Commencement Date, including but not limited to the right of the Landlord, without obligation to the Tenant except as set forth in Paragraph 7 below, to further lease space on the Structure or the Property and grant related easements for any purpose, including other antennae on the Structure.
- PERMITTED USE.** Tenant may use the Premises for the transmission and reception of communications signals and the installation, maintenance, operation, repair and replacement of its communication fixtures and related equipment, cables, accessories and improvements (collectively the "Communication Facility") and any other items necessary to the successful and secure operation of the Communication Facility, as substantially described in Exhibit 1; such use includes the right to test, survey and check title on the Property. Landlord's execution of this Agreement will signify Landlord's approval of Exhibit 1. Tenant has the right to make Property improvements, alterations or additions ("Tenant Changes") appropriate for Tenant's use. Tenant agrees to comply with all applicable governmental laws, rules, statutes and regulations, relating to its use of the Communication Facility on the Property. Tenant has the right to modify, supplement, replace, upgrade, expand the equipment, increase the number of antennas or relocate the Communication Facility within the Premises at any time during the term of this Agreement. All improvements and Tenant Changes will be at Tenant's sole cost and expense, and shall be performed in a good workmanlike manner. All work to be completed by Tenant shall be coordinated in advance with the Landlord so as to minimize any disruption with normal business activity of the Landlord and any other Tenant(s) on the property.
- TERM.** (a) The initial lease term will be five (5) years ("Initial Term"), commencing upon the Commencement Date, as defined below. The Initial Term will terminate on the last day of the month in which the fifth annual anniversary of the Commencement Date occurred.

1/25/2000
structure lease

(b) This Agreement will automatically renew for five (5) additional five (5) year Term(s) (each additional Term is called an "Extension Term"), upon the same terms and conditions unless the Tenant notifies the Landlord in writing of Tenant's intention not to renew this Agreement at least ninety (90) days prior to the expiration of the then existing Term.

(c) If Tenant remains in possession of the Premises after the termination or expiration of this Agreement then Tenant will be deemed to be occupying the Premises on a month to month basis (the "Holdover Term"), subject to the terms and conditions of this Agreement.

(d) The Initial Term, the Extension Terms and the Holdover Term are collectively referred to as the Term. ("Term").

4. **RENT.** (a) Commencing on the date that Tenant commences construction of any improvements or Tenant Changes to the Premises or the Property, being the sooner of the date Tenant obtains a building permit from the Town of Southington or the date any construction or demolition work is commenced by the Tenant, but no later than the sixtieth (60th) day following the execution of this Lease (the "Commencement Date"), Tenant will pay the Landlord a yearly rental payment of \$30,000.00, plus any applicable tax, to Landlord, at the address set forth above, on or before the 1st day of each lease year in advance or to such other person, firm, or place as Landlord may, from time to time, designate in writing at least thirty (30) days in advance of any due date. Rent will be prorated for any partial year.

(b) All Rent payments shall be made to the Landlord in full each year, without setoff or deduction of any kind.

(c) Tenant will pay all personal property taxes assessed on, or any portion of such taxes directly attributable to the Communication Facility. Tenant, upon presentation of sufficient and proper documentation will pay, within 30 days, an increase in real property taxes levied against the Property, excluding additional taxes that relate to the period prior to the Commencement Date, i.e., roll back taxes, which is directly attributable to Tenant's use of the Property, provided Tenant will be entitled to appeal any such increase payable by it. Landlord agrees that it will cooperate with an appeal of such taxes and will promptly pay all real estate taxes levied against the Property.

(d) On each anniversary of the Commencement Date during the Initial Term, any Extended Term or Holdover Term, the yearly Rent will increase by 3 percent (3%) over the previous year's Rent.

5. **APPROVALS.** (a) Landlord agrees that Tenant's ability to use the Premises is contingent upon its suitability for Tenant's intended use and Tenant's ability to obtain all governmental licenses, permits, approvals or other relief required of or deemed necessary by Tenant for its use of the Premises, including without limitation applications for zoning variances, zoning ordinances, amendments, special use permits, and construction permits (collectively referred to as "Governmental Approvals"). Landlord authorizes Tenant to prepare, execute and file all required applications to obtain Governmental Approvals for Tenant's use under this Agreement and agrees to reasonably assist Tenant with such applications

(b) Tenant has the right to obtain a title report or commitment for a leasehold title policy from a title insurance company of its choice and to have the Property surveyed by a surveyor of its choice.

(c) Tenant may also obtain, at Tenant's sole cost and expense, soil boring, percolation, engineering procedures, environmental investigation or other tests or reports ("Tests") on, over, and under the Property, necessary to determine if the Tenant's use of the Premises will be compatible with Tenant's engineering specifications, system, design, operations or Governmental Approvals.

6. **TERMINATION.** This Agreement may be terminated, without penalty or further liability, as follows:

(a) by either party on thirty (30) days prior written notice, if the other party remains in default under Paragraph 14 of this Agreement after the applicable cure periods;

(b) by Tenant upon written notice, if Tenant is unable to obtain, or maintain, any required approval(s) or the issuance of a license or permit by any agency, board, court or other governmental authority necessary for the construction or operation of the Communication Facility as now and hereafter intended by Tenant or if Tenant determines in its sole discretion that the cost of obtaining or retaining the same is commercially unreasonable;

(c) by Tenant on ninety (90) days written notice for any reason other than (a) or (b) above, or paragraph 7, below, so long as Tenant pays Landlord a termination fee equal to six (6) months rent, at the current rent rate.

7. **INTERFERENCE.** (a) Where there are existing radio frequency user(s) on the Landlord's Property, the Landlord will provide Tenant with a list of all existing radio frequency user(s) and their frequencies on the Property to allow Tenant to evaluate the potential for interference. Tenant warrants that its use of the Premises will not interfere with existing radio frequency user(s) on the Property as long as the existing radio frequency user(s) operate and continue to operate within their frequencies and in accordance with all applicable laws and regulations.

(b) Landlord will not grant, after the date of this Agreement, a lease, license or any other right to any third party for use of the Property, if such use may in any way materially adversely affect or interfere with Tenant's Communication Facility. Landlord will notify Tenant and receive Tenant's written approval prior to granting any third party the right to install and operate communications equipment on the Property. Tenant's approval will not be unreasonably withheld. Nothing contained herein will restrict Tenant nor its successors and assigns from installing and modifying its communications equipment.

(c) Landlord will not use, nor will Landlord permit its employees, tenants, licensees, invitees or agents to use, any portion of the Property in any way which interferes with the operations of Tenant or the rights of Tenant under this Agreement. Landlord will cause such interference to cease upon not more than twenty-four (24) hour notice from Tenant. In the event any such interference does not cease within the aforementioned cure period then the parties acknowledge that Tenant will suffer irreparable injury, and therefore, Tenant will have the right, in addition to any other rights that it may have at law or in equity, for Landlord's breach of this Agreement, to elect to enjoin such interference or to terminate the Agreement upon notice to Landlord.

(d) Tenant acknowledges that as of the date of this agreement, the remainder of the Property is leased to U.A.C. Inc. for a car dealership and such use will not adversely interfere with Tenant's Communication Facility.

8. **INDEMNIFICATION.** (a) Tenant agrees to indemnify, defend and hold Landlord harmless from and against any injury, loss, damage or liability (or any claims in respect of the foregoing), costs or expenses (including reasonable attorneys' fees and court costs) arising directly from the installation, use, maintenance, repair or removal of the Communication Facility or the breach of any provision of this Agreement, except to the extent attributable to the negligent or intentional act or omission of Landlord, its employees, agents or independent contractors.

(b) Landlord agrees to indemnify, defend and hold Tenant harmless from and against any and all injury, loss, damage or liability (or any claims in respect of the foregoing), costs or expenses (including reasonable attorneys' fees and court costs) arising directly from the actions or failure to act of Landlord or its employees or agents, or the breach of any provision of this Agreement, except to the extent attributable to the negligent or intentional act or omission of Tenant, its employees, agents or independent contractors.

(c) Notwithstanding anything to the contrary in this Agreement, each of Tenant and Landlord hereby waives any claims that they may have against the other with respect to consequential, incidental or special damages.

9. **WARRANTIES.** (a) Tenant and Landlord each acknowledge and represent that it is duly organized, validly existing and in good standing and has the right, power and authority to enter into this Agreement and bind itself hereto through the party set forth as signatory for the party below.

(b) Landlord represents and warrants that: (i) Landlord solely owns the Property as a legal lot in fee simple, or controls the Property by lease or license, unencumbered by any liens, restrictions, mortgages, covenants, conditions, easements, leases, agreements of record or not of record, which would adversely affect Tenant's use and enjoyment of the Premises under this Agreement; Excepting an Environmental Land Use Restriction, which is currently being reviewed by the Connecticut Department of Environmental Protection, a copy of which is attached hereto as exhibit 2. (ii) as long as Tenant is not in default then Landlord grants to Tenant sole, actual, quiet and peaceful use, enjoyment and possession of the Premises; (iii) its execution and performance of this Agreement will not violate any Laws, ordinances, covenants or the provisions of any mortgage, lease or other agreement binding on the Landlord; and (iv) if the Property is or becomes encumbered by a deed to secure a debt, mortgage or other security interest, the provisions of Paragraph 22 shall apply and Landlord will use best efforts to provide Tenant a mutually agreeable, Non-Disturbance and Attornment Agreement.

10. **ENVIRONMENTAL.** (a) Landlord and Tenant agree that each will be responsible for compliance with any and all environmental and industrial hygiene laws, including any regulations, guidelines, standards, or policies of any governmental authorities regulating or imposing standards of liability or standards of conduct with regard to any environmental or industrial hygiene condition or matters as may now or at any time hereafter be in effect, that are now or were related to that party's activity conducted in, or on the Property.

(b) Landlord and Tenant agree to hold harmless and indemnify the other from and to assume all duties, responsibilities, and liabilities at its sole cost and expense, for all duties, responsibilities and liability (for payment of penalties, sanctions, forfeitures, losses, costs, or damages) and for responding to any action, notice, claim, order, summons, citation, directive, litigation, investigation or proceeding which is related to (i) failure to comply with any environmental or industrial hygiene law, including without limitation any regulations, guidelines, standards or policies of any governmental authorities regulating or imposing standards of liability or standards of conduct with regard to any environmental or industrial hygiene conditions or matters as may now or hereafter be in effect, and (ii) any environmental or industrial hygiene conditions that arise out of or are in any way related to the condition of the Property or activities conducted by the party thereon, unless the environmental conditions are caused by the other party.

(c) Notwithstanding anything to the contrary contained herein, Landlord specifically advises Tenant that petroleum hydrocarbon containing materials are present on the Property and Landlord agrees to be solely responsible and liable for any and all costs, damages, liabilities associated with said petroleum hydrocarbons.

(d) The indemnification's of this Paragraph specifically include reasonable costs, expenses and fees incurred in connection with any investigation of Property conditions or any clean-up, remediation, removal or restoration work required by any governmental authority. The provisions of this Paragraph will survive the expiration or termination of this Agreement.

(e) The provisions of this agreement shall be subject and subordinate in all respects to any present or future Declaration of Environmental Land Use Restriction and Grant of Easement (or any amendment thereof) applicable to the Property at the present or in the future (an "ELUR"), including but not limited to a certain Declaration of Environmental Land

Use Restriction and Grant of Easement dated August 7, 2001, between 500 Queen Street Limited Partnership and the Commissioner of Environmental Protection of the State of Connecticut a copy of which as presented to the Connecticut DEP for approval is attached hereto as Exhibit 2. Although no instrument or act on the part of the Tenant shall be necessary to effectuate such subordination, the Tenant will, nevertheless execute and deliver such further instruments subordinating this agreement to an ELUR as may be required by the Commissioner of Environmental Protection of the State of Connecticut. To the extent the ELUR applies to the Tenant's use of the Premises, Tenant further agrees to comply with the terms of the ELUR during the Initial Term and all Extension Terms.

11. **ACCESS.** At all times throughout the Term of this Agreement, and at no additional charge to Tenant, Tenant and its employees, agents, and subcontractors, will have twenty-four hour, seven day access to and over the Property, from an open and improved public road to the Premises, for the installation, maintenance and operation of the Communication Facility and any utilities serving the Premises. In the event any public utility is unable to use the access provided to Tenant the Landlord hereby agrees to grant an additional access either to Tenant or to the public utility, for the benefit of Tenant, at no cost to Tenant.

12. **REMOVAL.** All portions of the Communication Facility brought onto the Property by Tenant will be and remain Tenant's personal property and, at Tenant's option, may be removed by Tenant at any time during the Term. Landlord covenants and agrees that no part of the Communication Facility constructed, erected or placed on the Premises by Tenant will become, or be considered as being affixed to or a part of, the Property, it being the specific intention of the Landlord that all improvements of every kind and nature constructed, erected or placed by Tenant on the Premises will be and remain the property of the Tenant and may be removed by Tenant at any time during the Term. Within one hundred twenty (120) days of the termination of this Agreement, Tenant will remove all such improvements. Footings, foundations, and concrete will be removed to a depth of one foot below grade. After any removal of the Communication Facility, or any improvements or Tenant Changes, the Tenant shall restore the Premises and the Property to their previous condition prior to the installation thereof, reasonable wear and tear excepted.

13. **MAINTENANCE ; UTILITIES.** (a) Tenant will keep and maintain the Premises in good condition, reasonable wear and tear and damage from the elements excepted. Landlord will maintain and repair the Property and access thereto, in good and tenantable condition, subject to reasonable wear and tear and damage from the elements. Notwithstanding the foregoing, Tenant shall keep and maintain in good repair, the communications facility and other Tenant improvements or Tenant Changes which are made.

(b) Tenant will be solely responsible for and promptly pay all utilities charges for electricity, telephone service or any other utility used or consumed by Tenant on the Premises. Landlord will fully cooperate with any utility company requesting an easement over, under and across the Property in order for the utility company to provide service to the Tenant. In the event Tenant cannot secure its own metered electrical supply, Tenant will have the right, at its own cost and expense, to submeter from the Landlord. Tenant will pay on a monthly basis the current local utility company rate for submetered electric, after the meter is read by the Landlord and billed to Tenant. Landlord will not be responsible for interference with, interruption of or failure, beyond the reasonable control of Landlord, of such services to be furnished or supplied by Landlord.

14. **DEFAULT AND RIGHT TO CURE.** (a) The following will be deemed a default by Tenant and a breach of this Agreement: (i) non-payment of Rent if such rent remains unpaid for more than fifteen (15) days from time written notice is given to Tenant; or (ii) Tenant's failure to perform any other term or condition under this Agreement within forty-five (45) days after receipt of written notice from Landlord specifying the failure; or (iii) Tenant shall become insolvent or shall admit in writing its inability to pay its debts generally as they become due, or a bankruptcy petition shall be filed by or against the Tenant. No failure under subparagraph

(ii) shall be deemed to exist if Tenant has commenced to cure such default with such period and provided such efforts are prosecuted to completion with reasonable diligence; provided, however, that delay in curing such a default will be excused if due to causes beyond the reasonable control of Tenant. If Tenant remains in Default beyond any applicable cure period, Landlord will have the right to exercise any and all rights and remedies available to it under law and equity, including the right to cure the Tenant's default and either deduct the costs of cure from any money owed by Landlord to the Tenant or collect the same directly from Tenant and interest shall accrue at the per annum rate of 12% on any such sum not paid within thirty (30) days of receipt of written notice thereof.

(b) The following will be deemed a default by Landlord and a breach of this Agreement. Landlord's failure to perform any term or condition under this Agreement within forty-five (45) days after receipt of written notice from Tenant specifying the failure. No such failure, however, will be deemed to exist if Landlord has commenced to cure the default within such period and provided such efforts are prosecuted to completion with reasonable diligence. Delay in curing a default will be excused if due to causes beyond the reasonable control of Landlord. If Landlord remains in default beyond any applicable cure period, Tenant will have the right to exercise any and all rights available to it under law and equity.

15. ASSIGNMENT/SUBLEASE.

(a) Tenant shall have the right to assign and transfer its rights under this agreement to any person or business entity which is licensed by the FCC to operate a wireless communications business or which is (i) a parent, subsidiary or affiliate of the Tenant, or (ii) is controlled by or under common control with the Tenant, or (iii) is merged or consolidated with the Tenant, or (iv) purchases more than a fifty (50%) percent interest in the ownership or assets of Tenant. In all other instances, Tenant shall obtain Landlord's prior written consent for assignment, which consent shall not be unreasonably withheld, conditioned, or delayed.

(b) Tenant shall not sublease any portion of the Structure or the Premises or grant a license thereof or enter into any sublease hereof.

16. NOTICES. All notices, requests, demands and communications hereunder will be given by first class certified or registered mail, return receipt requested, or by a recognized overnight courier, postage prepaid, to be effective when properly sent and received, refused or returned undelivered. Notice will be addressed to the parties at the addresses set forth above (as to Tenant, Attn.: System Development Manager; with a copy to AT&T Wireless, 15 East Midland Avenue, Paramus, New Jersey 07652, Attn.: Legal Department). Either party hereto may change the place for the giving of notice to it by thirty (30) days written notice to the other as provided herein.

17. SEVERABILITY. If any term or condition of this Agreement is found unenforceable, the remaining terms and conditions will remain binding upon the parties as though said unenforceable provision were not contained herein. However, if the invalid, illegal or unenforceable provision materially affects this Agreement then the Agreement may be terminated by either party on ten (10) days prior written notice to the other party hereto.

18. CONDEMNATION. In the event Landlord receives notification of any condemnation proceedings affecting the Property, Landlord will provide timely notice of the proceeding to Tenant. If a condemning authority takes all of the Property, or a portion sufficient, to render the Premises unsuitable for Tenant's Permitted Use, this Agreement will terminate as of the date the title vests in the condemning authority. The Tenant shall have no claim against the Landlord nor be entitled to any portion of the amount that may be awarded as damages or paid to the Landlord as a result of such condemnation and or taking whether by award, judgement, settlement or otherwise. Tenant shall have the right to make its own claim against the condemning authority and the Landlord shall

have no claim against the Tenant nor be entitled to any portion of the amount that may be awarded as damages or paid to the Tenant as a result of such condemnation and or taking whether by award, judgement, settlement, or otherwise.

19. **CASUALTY.** Landlord will provide notice to Tenant of any casualty affecting the Property within forty-eight (48) hours of the casualty. If any part of the Communication Facility or Property is damaged by fire or other casualty so as to render the Premises unsuitable, in Tenant's sole determination, then Tenant may terminate this Agreement by providing written notice to the Landlord, which termination will be effective as of the date of such damage or destruction. Upon such termination, Tenant will be entitled to collect all insurance proceeds payable to Tenant on account thereof and to be reimbursed for any prepaid Rent.

20. **WAIVER OF LANDLORD'S LIENS.** Landlord hereby waives any and all lien rights it may have, statutory or otherwise, concerning the Communication Facility or any portion thereof. The Communication Facility shall be deemed personal property for purposes of this Agreement, regardless of whether any portion is deemed real or personal property under applicable law, and Landlord hereby consents to Tenant's right to remove all or any portion of the Communication Facility from time to time in Tenant's sole discretion and without Landlord's consent.

21. **MISCELLANEOUS.** (a) **Amendment; Waiver.** This Agreement cannot be amended, modified or revised unless done in writing and signed by an authorized agent of the Landlord and an authorized agent of the Tenant. No provision may be waived except in a writing signed by both parties.

(b) **Short Form Lease.** Either party will, at any time upon fifteen (15) days prior written notice from the other, execute, acknowledge and deliver to the other a recordable Memorandum of Lease. Either party may record this memorandum at any time, in its absolute discretion.

(c) **Bind And Benefit.** The terms and conditions contained in this Agreement will run with the Property and inure to the benefit of the parties, their respective heirs, executors, administrators, successors and assigns.

(d) **Entire Agreement.** This Agreement and the exhibits attached hereto, all being a part hereof, constitute the entire agreement of the parties hereto and will supersede all prior offers, negotiations and agreements.

(e) **Governing Law.** This Agreement will be governed by the laws of the state in which the Premises are located, without regard to conflicts of law.

(f) **Interpretation.** Unless otherwise specified, the following rules of construction and interpretation apply: (i) captions are for convenience and reference only and in no way define or limit the construction of the terms and conditions hereof; (ii) use of the term "including" will be interpreted to mean "including but not limited to"; (iii) whenever a party's consent is required under this Agreement, except as otherwise stated in the Agreement or as same may be duplicative, such consent will not be unreasonably withheld, conditioned or delayed; (iv) exhibits are an integral part of the Agreement and are incorporated by reference into this Agreement; (v) use of the terms "termination" or "expiration" are interchangeable, and (vi) reference to a default will take into consideration any applicable notice, grace and cure periods.

(g) **Estoppel.** Either party will, at any time upon fifteen (15) days prior written notice from the other, execute, acknowledge and deliver to the other a statement in writing (i) certifying that this Agreement is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying this Agreement, as so modified, is in full force and effect) and the date to which the rent and other charges are paid in advance, if any, and (ii) acknowledging that there are not, to such party's knowledge, any uncured defaults on the part of the other party hereunder, or specifying such defaults if any are claimed. Any such statement may be conclusively relied upon by any prospective purchaser or encumbrancer of the Premises. Failure to deliver such a statement within such time will be conclusive upon the requesting party that (i) this Agreement is in full force and effect, without

modification except as may be properly represented by the requesting party, (ii) there are no uncured defaults in either party's performance, and (iii) no more than one month's rent has been paid in advance.

(h) No Option. The submission of this Agreement for examination or consideration does not constitute a reservation of or option for the Premises. This Agreement will become effective as an Agreement only upon the legal execution, acknowledgment and delivery hereof by Landlord and Tenant.

22. SUBORDINATION OF MORTGAGES. The Tenant expressly covenants and agrees that this lease and all rights of the Tenant hereunder shall be subject and subordinate in all respects to any present or future mortgage (or any amendment thereof) encumbering the Property. Although no instrument or act on the part of the Tenant shall be necessary to effectuate such subordination, the Tenant will nevertheless, execute and deliver, such further instruments subordinating this agreement to the lien of any such mortgages as may be required by the Landlord or the mortgagee, provided such instruments are reasonably acceptable to Tenant.

IN WITNESS WHEREOF, the undersigned has caused this Agreement to be executed this 21st day of August, 2001.

WITNESSES:

[Signature]
Print Name: DAVID E. JWSKIE
[Signature]
Print Name: Chris Fitzgerald

"LANDLORD"
RAP PROPERTIES LLC

[Signature]
By: _____
Print Name: ROYA PARSONS
Its: MEMBER

"TENANT"

[Signature]
Print Name: Connel Lambertes
[Signature]
Print Name: Dawn Schofield

[Signature] 8/31/01
By: _____
Print Name: Carmen M Chapman
Its: Systems Development Manager

CORPORATE ACKNOWLEDGMENT

STATE OF Connecticut,
COUNTY OF Fairfield, ss:

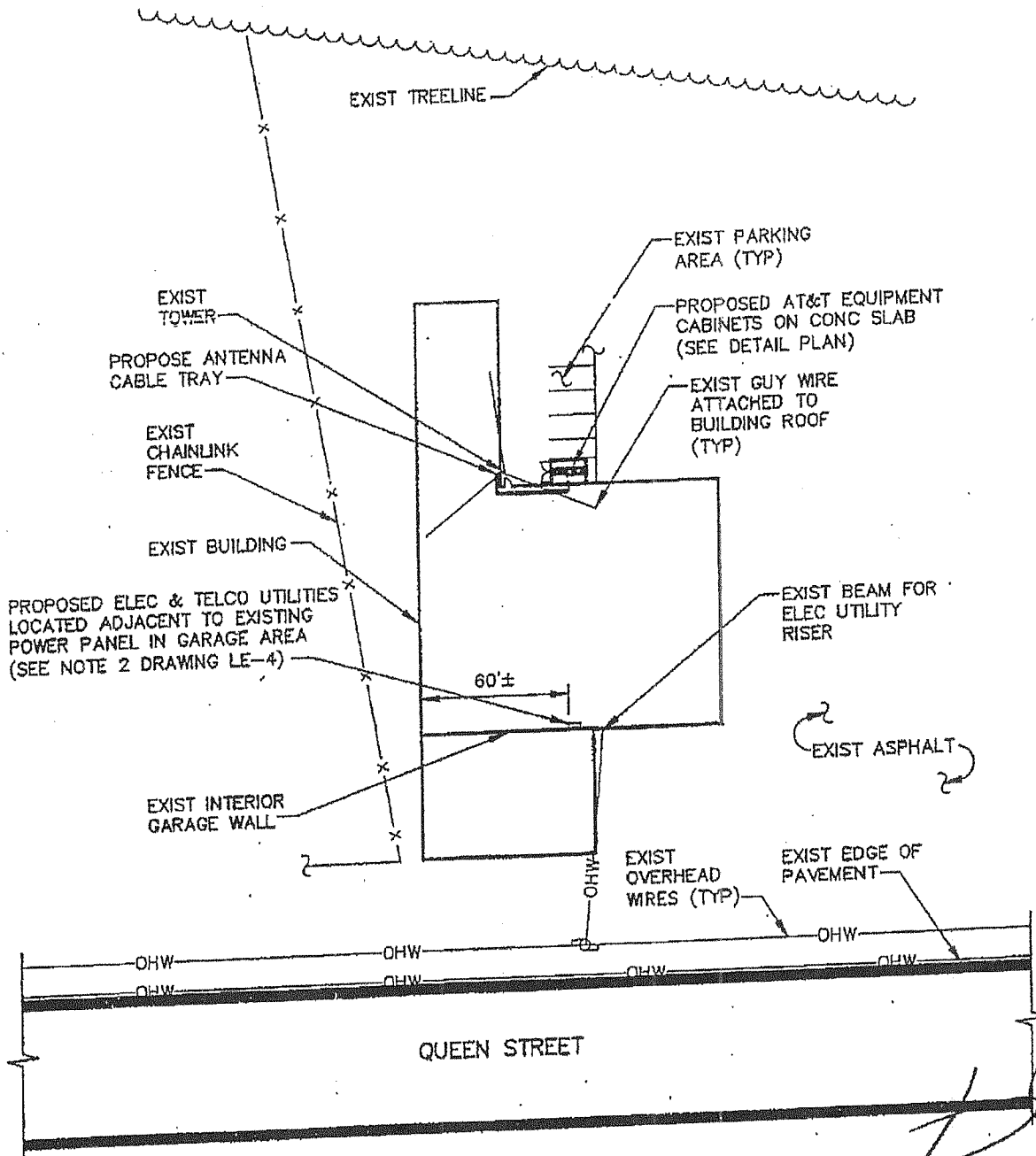
I CERTIFY that on August 31, 2006, Carmen Chapman [name of representative]
personally came before me and acknowledged under oath that he or she:

- (a) is the Systems Developer [title] of AT&T Wireless Services [name of corporation], the corporation named in the attached instrument,
- (b) was authorized to execute this instrument on behalf of the corporation and
- (c) executed the instrument as the act of the corporation.

Connie A. Lamberes
Notary Public
My Commission Expires: _____

CONNIE A. LAMBERES
NOTARY PUBLIC
MY COMMISSION EXPIRES JULY 31, 2008

TRUE N



ISSUED FOR LEASE

TECTONIC ENGINEERING CONSULTANTS P.C.
2075 Route 202
Carmel, NY 12816

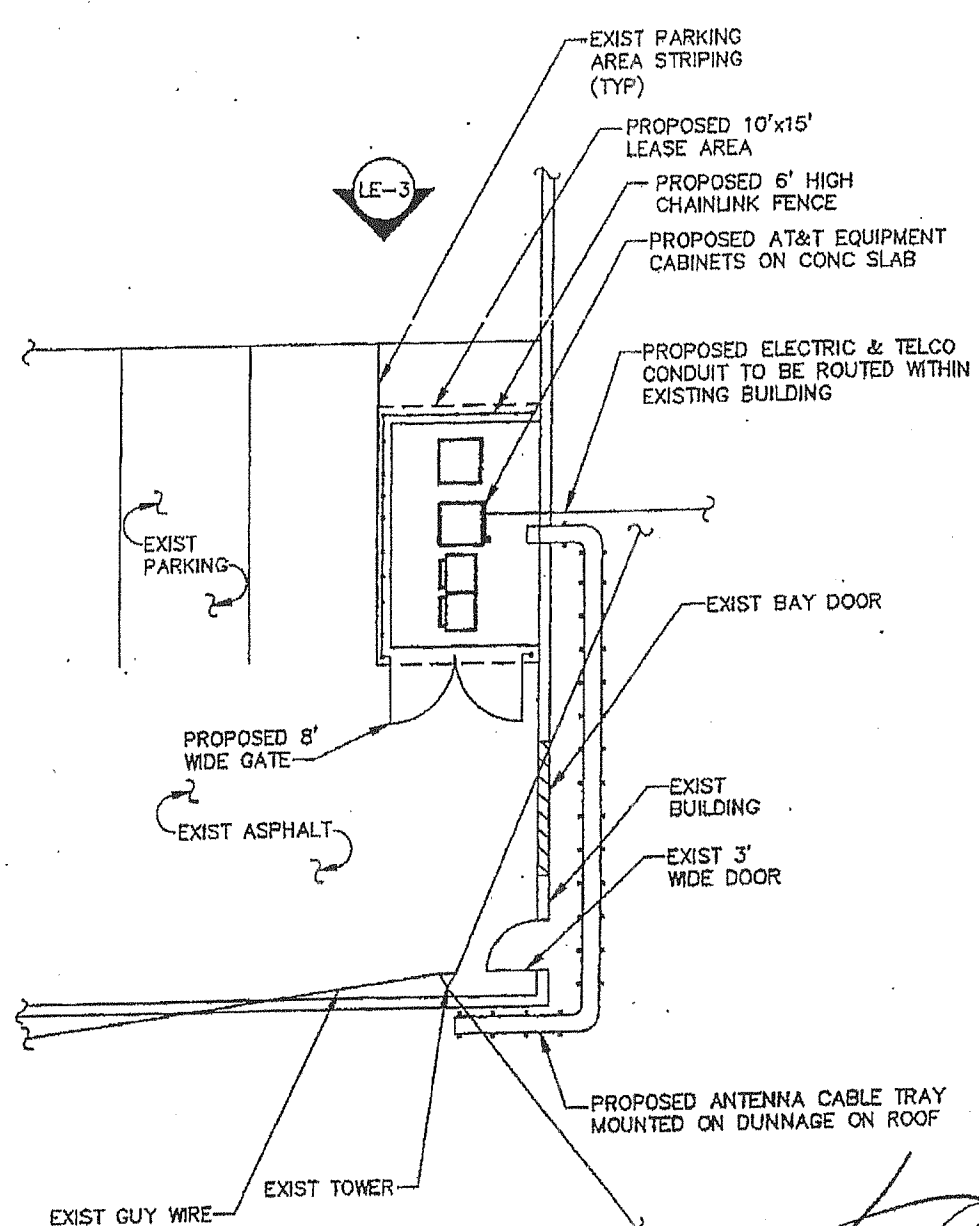


DRAWING TITLE: **SITE PLAN**
PROJECT INFORMATION:
CLAYTON MOTORS
CT-251
500 QUEEN STREET
SOUTHINGTON, CT


PROPERTY OWNER:
500 QUEEN ST. LTD PTNERSHIP
300 CONNECTICUT BLVD
EAST HARTFORD, CT 06108

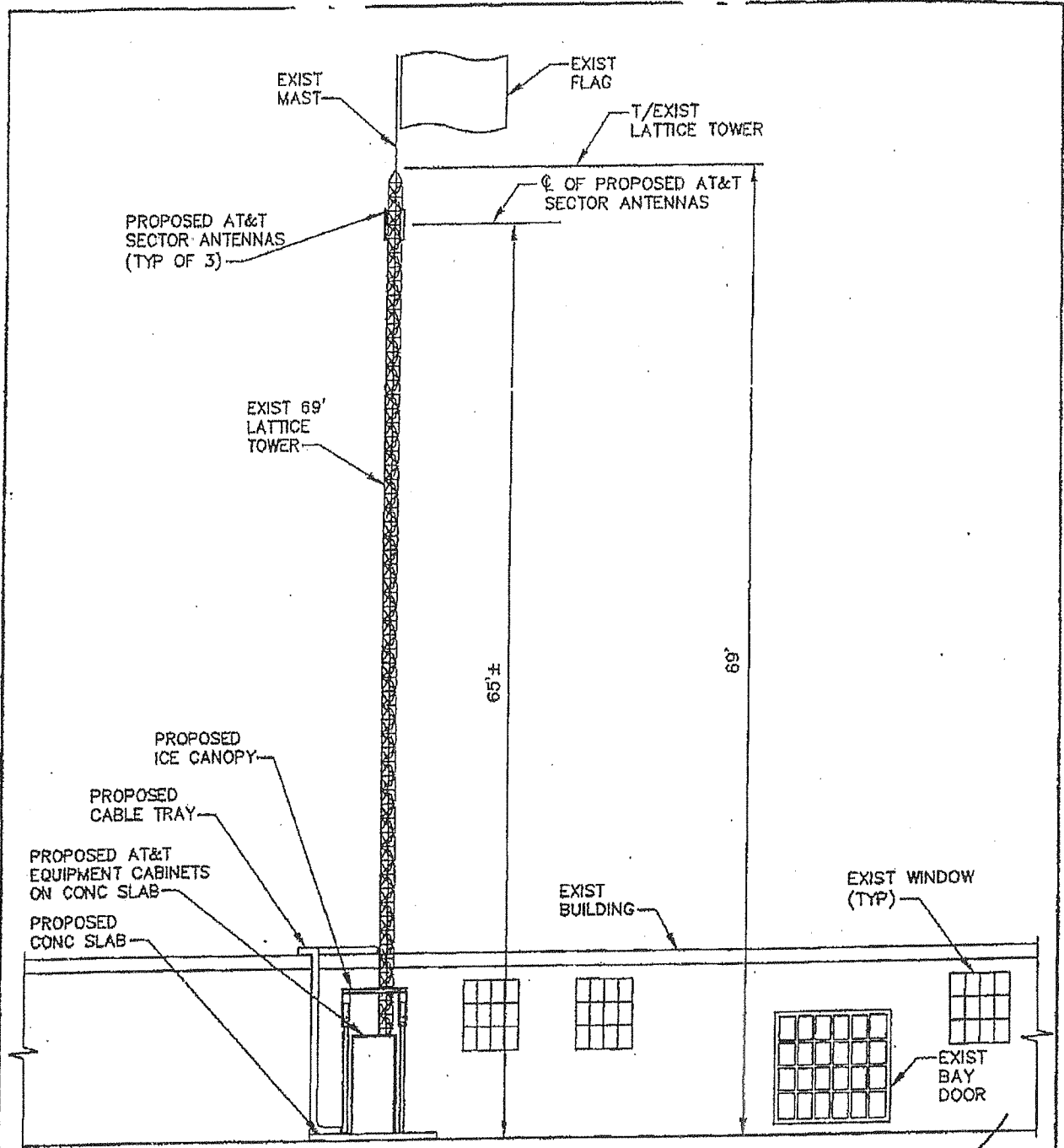
DRAWING NO.
LE-1

REVISION NO. 1	DRAWN BY: CA
DATE: 12/22/00	CHECKED BY: DL
SCALE: 1" = 60'	APPROVED BY: DL
ISSUED FOR LEASE	SHEET NO. 1 of 4
WORK ORDER #: 2650.CT251	



NOTE: ICE CANOPY NOT SHOWN FOR CLARITY

TECTONIC ENGINEERING CONSULTANTS P.C. <small>2879 Route 9W Canaan, NY 12919</small> <small>(914) 254-3400</small>	 AT&T <small>AT&T WIRELESS PCS, LLC. 140 Water Street Norwich, CT 06254</small>	DRAWING TITLE: DETAIL PLAN	DRAWING NO. LE-2	
		PROJECT INFORMATION: CLAYTON MOTORS CT-251 500 QUEEN STREET SOUTHWINGTON, CT	REVISION NO. 1 DATE: 12/22/00 SCALE: 1" = 10' ISSUED FOR LEASE WORK ORDER #: 2850.GT251	DRAWN BY: CA CHECKED BY: DL APPROVED BY: DL SHEET NO. 2 of 4



NOTE: EQUIPMENT AREA FENCE NOT SHOWN FOR CLARITY.

TECTONIC ENGINEERING
CONSULTANTS P.C.
1878 Route 93
Glastonbury, CT 06033



DRAWING TITLE:
ELEVATION
PROJECT INFORMATION:
CLAYTON MOTORS
CT-251
500 QUEEN STREET
SOUTHINGTON, CT

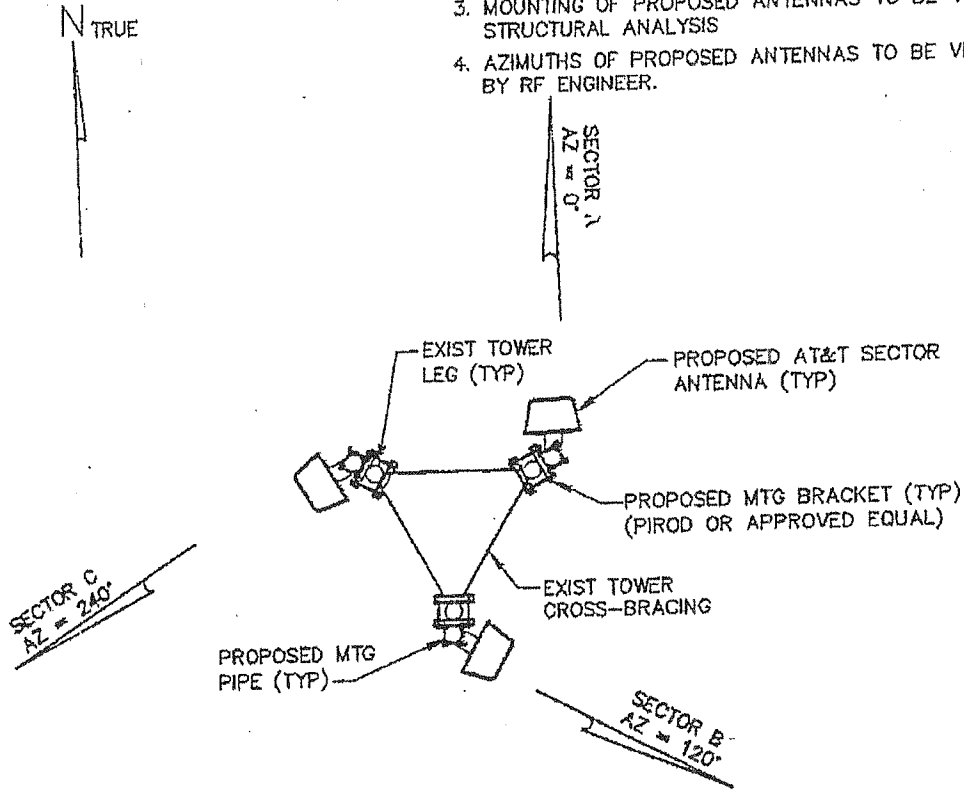
PROPERTY OWNER:
500 QUEEN ST, LTD PTNERSHIP
300 CONNECTICUT BLVD
EAST HARTFORD, CT 06108

DRAWING NO.
LE-3


REVISION NO. 1	DRAWN BY: CA
DATE: 12/22/00	CHECKED BY: DL
SCALE: 1"=10'	APPROVED BY: DL
ISSUED FOR LEASE	SHEET NO. 3 of 4
WORK ORDER #: 2650.CT251	

GENERAL NOTES:

1. PROPOSED TOTAL LEASE AREA IS APPROXIMATELY 170 SQ. FT. (150 SQ. FT. AT PROPOSED EQUIPMENT, 20 SQ. FT. AT PROPOSED ELECTRIC & TELCO UTILITIES).
2. 3' CLEAR SPACE IS REQUIRED IN FRONT OF THE PROPOSED ELEC & TELCO UTILITIES.
3. MOUNTING OF PROPOSED ANTENNAS TO BE VERIFIED BY STRUCTURAL ANALYSIS
4. AZIMUTHS OF PROPOSED ANTENNAS TO BE VERIFIED BY RF ENGINEER.



[Handwritten signature]

<p>TECTONIC ENGINEERING CONSULTANTS P.C. 3770 Route 10C Garden City, NY 11731</p>	 <p>AT&T AT&T WIRELESS PCS, L.L.C. 140 Water Street Hartford, CT 06104</p>	<p>DRAWING TITLE: ANTENNA MTG PLAN PROJECT INFORMATION: CLAYTON MOTORS CT-251 500 QUEEN STREET SOUTHINGTON, CT PROPERTY OWNER: 500 QUEEN ST. LTD PTNERSHIP 300 CONNECTICUT BLVD EAST HARTFORD, CT 06108</p>	<p>DRAWING NO. LE-4</p> <table border="1"> <tr> <td>REVISION NO. 1</td> <td>DRAWN BY: CA</td> </tr> <tr> <td>DATE: 12/22/00</td> <td>CHECKED BY: DL</td> </tr> <tr> <td>SCALE: NONE</td> <td>APPROVED BY: DL</td> </tr> <tr> <td>ISSUED FOR LEASE</td> <td>SHEET NO. 4 OF 4</td> </tr> <tr> <td colspan="2">WORK ORDER #: 2650, CT251</td> </tr> </table>	REVISION NO. 1	DRAWN BY: CA	DATE: 12/22/00	CHECKED BY: DL	SCALE: NONE	APPROVED BY: DL	ISSUED FOR LEASE	SHEET NO. 4 OF 4	WORK ORDER #: 2650, CT251	
REVISION NO. 1	DRAWN BY: CA												
DATE: 12/22/00	CHECKED BY: DL												
SCALE: NONE	APPROVED BY: DL												
ISSUED FOR LEASE	SHEET NO. 4 OF 4												
WORK ORDER #: 2650, CT251													



Property Information

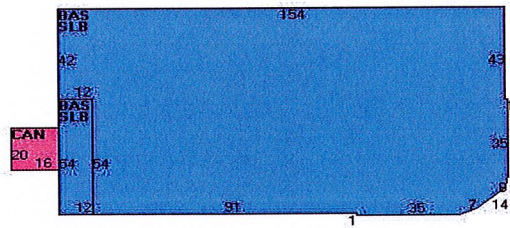
Property Location	500 QUEEN ST
Owner	RAP PROPERTIES LLC
Co-Owner	C/O RITE AID CORP
Mailing Address	PO BOX 3165 HARRISBURG PA 17105
Land Use	322 Discount Stores
Land Class	C
Water Service	

Sewer Service	
Census Tract	4303
Neighborhood	1450
Zoning Code	B
Acreage	2.2
Book / Page	804/ 218
Lot Setting/Desc	
Trash Day	

Photo



Sketch



Primary Construction Details

Year Built	2009
Stories	1
Building Style	Pharmacy
Building Use	Ind/Comm
Building Condition	B
Floors	Average
Total Rooms	

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	
Bath Style	n/a
Kitchen Style	n/a
Roof Style	Gable
Roof Cover	Asphalt Shingl

Exterior Walls	Brick
Interior Walls	Average
Heating Type	Forced Hot Air
Heating Fuel	Typical
AC Type	Central
Gross Bldg Area	29888
Total Living Area	14784



Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		2596920
Outbuildings	151150	105800
Improvements	3951690	2766190
Extras	90660	63470
Land	849010	594310
Total	4800700	3360500

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Slab	14784	0
Canopy	320	0
First Floor	14784	14784
Total Area	29888	14784

Outbuilding and Extra Items

Type	Description
Drive Up Window	1.00 Units
Cooler	152.00 S.F.
Sprinklers-Wet	15746.00 S.F.
1 Light w/PL	27.00 Units
Drive Up Window	1.00 Units
Fence - Chain	960.00 L.F.
Mezzanine-Unfin	648.00 S.F.
Paving	784.00 S.F.
Paving	1320.00 S.F.
Paving	1310.00 S.F.

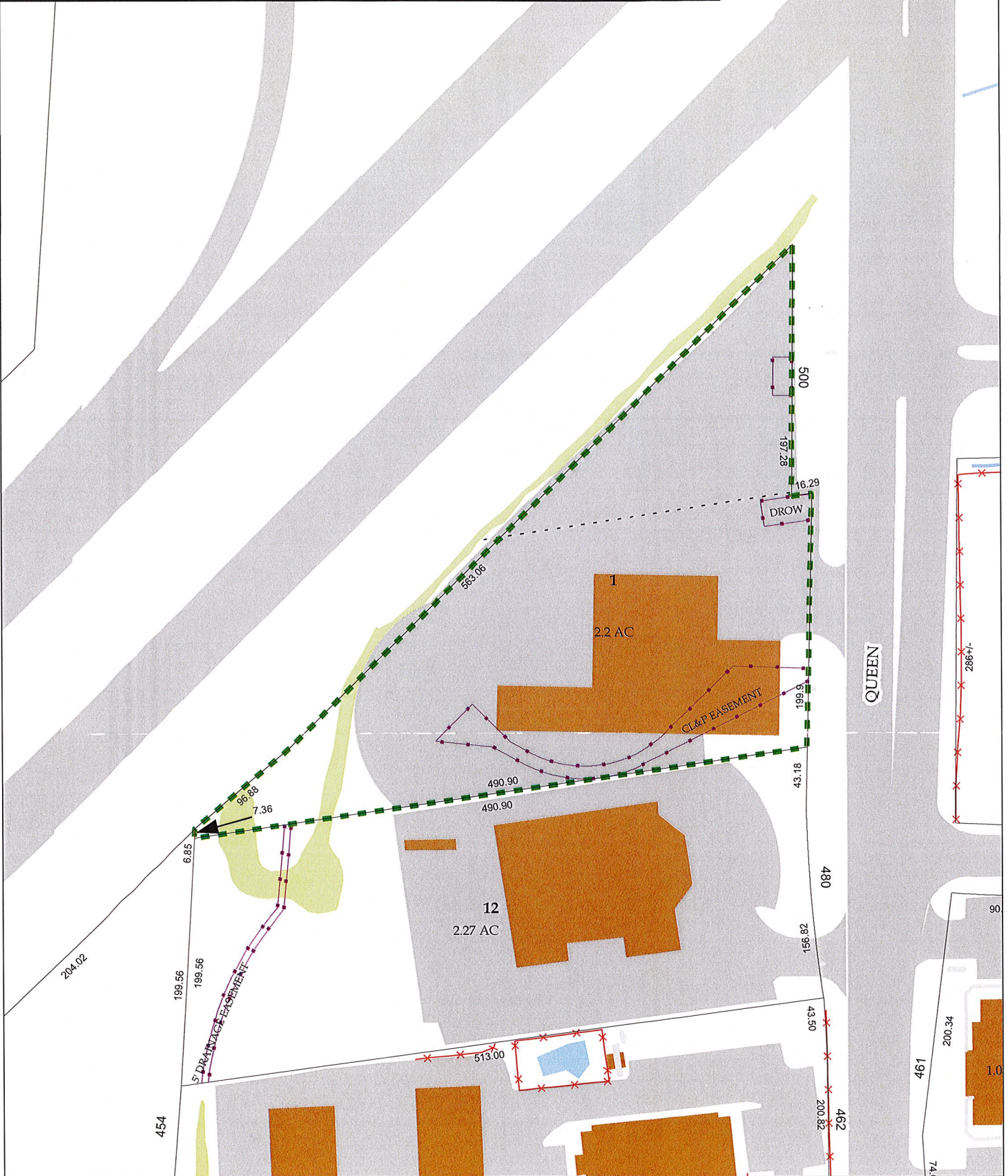
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
RAP PROPERTIES LLC	804/ 218	2001-08-24	1356873

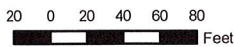
Town of Southington, Connecticut - Assessment Parcel Map

Parcel: 169001

Address: 500 QUEEN ST



Approximate Scale:



Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Southington and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced April 2017

PROJECT INFORMATION	
SCOPE OF WORK:	<p><u>ITEMS TO BE MOUNTED ON THE EXISTING TOWER:</u> (3) LTE 3C ANTENNAS, (6) TMAS, & (12) LINES OF 7/8" COAX.</p> <p><u>ITEMS TO BE INSTALLED INSIDE THE EXISTING AT&T EQUIPMENT AREA:</u> (1) DUL TO DUS UPGRADE & (1) DUS WITHIN EXISTING LTE RACK, (3) RRUS-11, (3) RRUS-32, (1) RACK MOUNTED DC6 SURGE ARRESTOR & (12) PENTAPLEXERS</p> <p><u>ITEMS TO BE REMOVED:</u> (3) LTE 2C ANTENNAS, (3) TMA'S, & (6) LINES 1-5/8" COAX</p> <p>PTN: 2051A03JME</p> <p>RFDS_REVISION: 10 DATE: 06/07/2017</p>
SITE ADDRESS:	500 QUEEN STREET SOUTHINGTON, CT 06489
LATITUDE:	N 41.63029° N 41° 37' 49.05"
LONGITUDE:	W 72.87469° W 72° 52' 28.91"
USID:	16335
LANDLORD:	CROWN CASTLE
TYPE OF SITE:	UNIPOLE / EQUIPMENT SHELTER
TOWER HEIGHT:	EXISTING: 82'-0"
RAD CENTER:	EXISTING: 77'-6"
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY



FA NUMBER: 10092205
SITE NUMBER: CTL05251
SITE NAME: SOUTHINGTON
INDUSTRIAL CENTER
500 QUEEN STREET
SOUTHINGTON, CT 06489

PROJECT: LTE 3C

PROJECT TEAM	
CLIENT REPRESENTATIVE	RF ENGINEER
COMPANY: SMARTLINK, LLC	COMPANY: AT&T MOBILITY – NEW ENGLAND
ADDRESS: 1997 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200	ADDRESS: 550 COCHITUATE ROAD SUITE 550 13 AND 14
CITY, STATE, ZIP: ANNAPOLIS, MD 21401	CITY, STATE, ZIP: FRAMINGHAM, MA 01701
CONTACT: TIM BOYCE	CONTACT: CAMERON SYME
PHONE: (908) 333-3640	PHONE: (508) 596-7146
E-MAIL: tboyce@smartlinkllc.com	E-MAIL: cs6970@att.com
SITE ACQUISITION	CONSTRUCTION MANAGER
COMPANY: SMARTLINK, LLC	COMPANY: SMARTLINK, LLC.
ADDRESS: 85 RANGEWAY RD, SUITE 102	ADDRESS: 85 RANGEWAY RD, SUITE 102
CITY, STATE, ZIP: BILLERICA, MA 01862	CITY, STATE, ZIP: BILLERICA, MA 01862
CONTACT: SHARON R. KEEFE	CONTACT: MARK J. DONNELLY
PHONE: (978) 930-3918	PHONE: (617) 515-2080
E-MAIL: sharon.keefe@smartlinkllc.com	E-MAIL: mark.donnelly@smartlinkllc.com
ENGINEERING	
COMPANY: HUDSON DESIGN GROUP, LLC.	
ADDRESS: 1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090	
CITY, STATE, ZIP: NORTH ANDOVER, MA 01845	
CONTACT: DANIEL P. HAMM, PE	
PHONE: (978) 557-5553	
E-MAIL: info@hudsondesigngroupllc.com	

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	4
GN-1	GENERAL NOTES	4
A-1	COMPOUND & EQUIPMENT PLANS	4
A-2	ELEVATIONS	4
A-3	ANTENNA LAYOUTS & DETAILS	4
A-4	DETAILS	4
RF-1	RF PLUMBING DIAGRAM	4
G-1	GROUNDING DETAILS	4

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD 0.3 MI. TURN LEFT ONTO CAPITAL BLVD 0.3 MI. TURN LEFT ONTO WEST ST 0.3 MI. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN 1.8 MI. TAKE EXIT 22N TO MERGE ONTO CT-9 N TOWARD NEW BRITAIN 6.5 MI. TAKE EXIT 28 ON THE LEFT TO MERGE ONTO CT-72 W TOWARD BRISTOL 3.2 MI. MERGE ONTO I-84 W 3.7 MI. TAKE EXIT 32 FOR CT-10/QUEEN ST 0.3 MI. TURN RIGHT ONTO CT-10 S/QUEEN ST. DESTINATION WILL BE ON THE RIGHT.



GENERAL NOTES

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

DISCIPLINE:	SIGNATURE:	DATE:
THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
SMARTLINK SITE ACQUISITION:		
SMARTLINK CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455
OR CALL 811
UNDERGROUND SERVICE ALERT

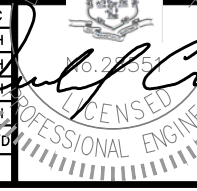
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL05251
SITE NAME: SOUTHINGTON
INDUSTRIAL CENTER
 500 QUEEN STREET
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 HARTFORD COUNTY

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

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0	05/24/16	ISSUED FOR REVIEW	SB	HC	DPH



AT&T	
TITLE SHEET (LTE 3C)	
SITE NUMBER	DRAWING NUMBER
CTL05251	T-1
	REV
	4

GROUNDING NOTES

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

GENERAL NOTES

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

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
 SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 BUILDING CODE: IBC 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS
 ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
 LIGHTNING CODE: REFER TO ELECTRICAL DRAWINGS

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

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

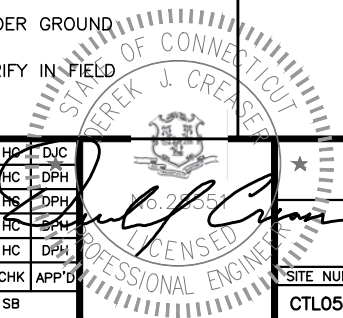
 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
 MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

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

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

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

ABBREVIATIONS					
AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		



Hudson Design Group
 1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586

smartlink
 1997 ANNAPOLIS EXCHANGE PKWY
 SUITE 200
 ANNAPOLIS, MD 21401

SITE NUMBER: CTL05251
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 HARTFORD COUNTY

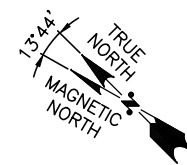
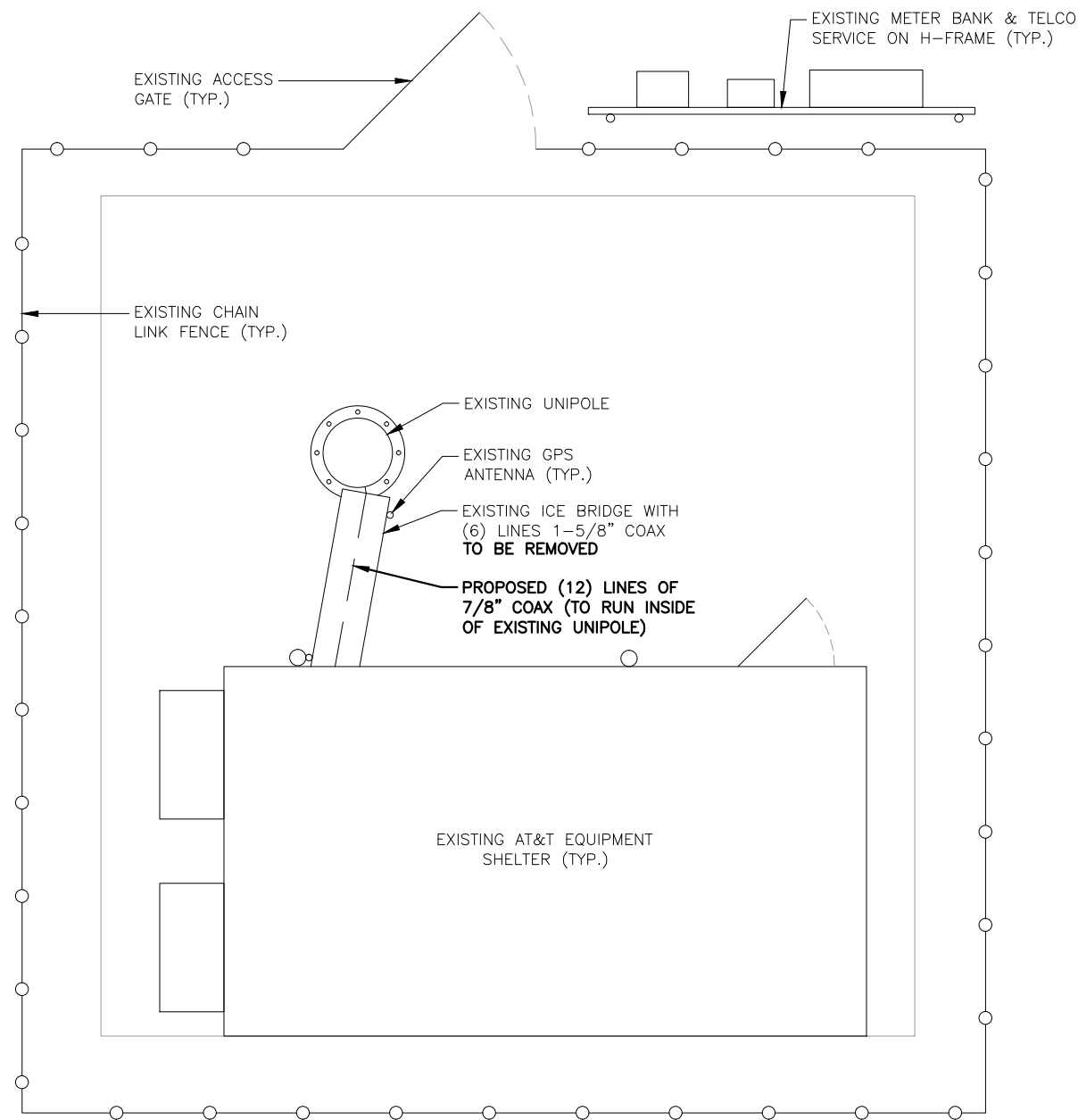
at&t
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AT&T
GENERAL NOTES (LTE 3C)
 SITE NUMBER: CTL05251
 DRAWING NUMBER: GN-1
 REV: 4

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

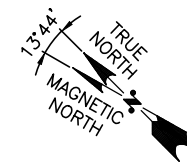
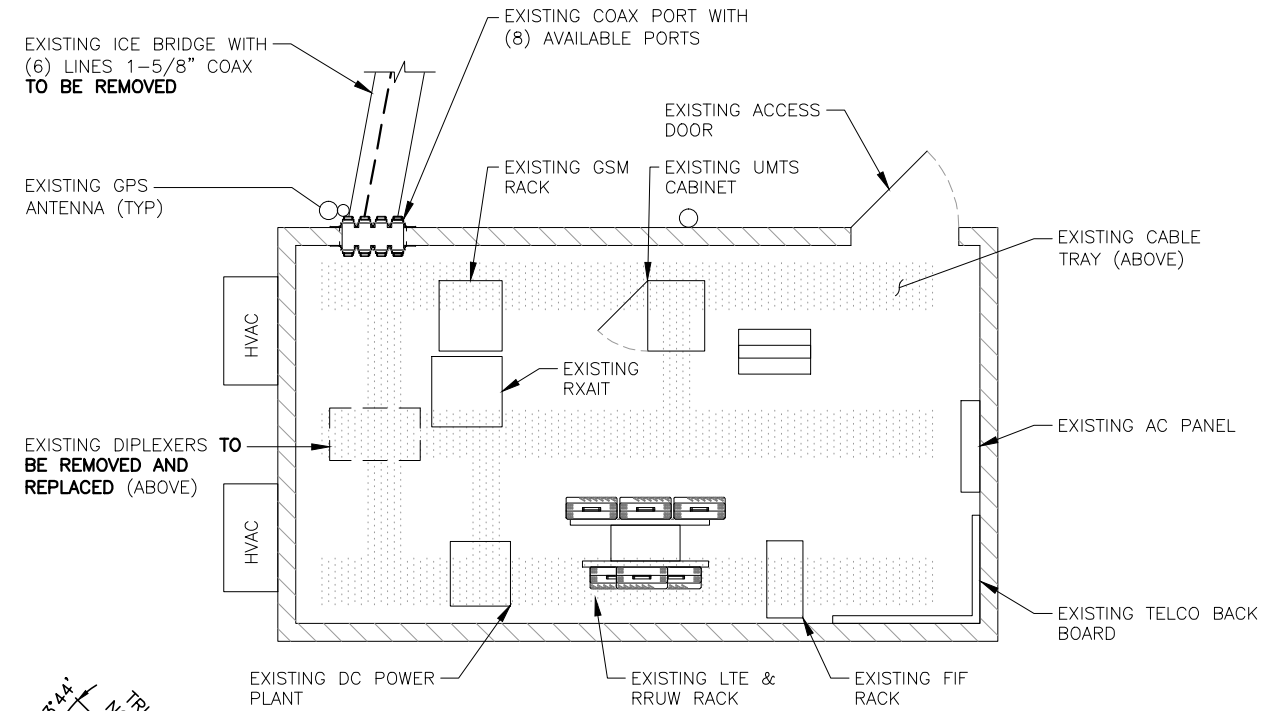
NOTE:
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



COMPOUND PLAN
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

1
A-1

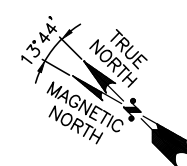
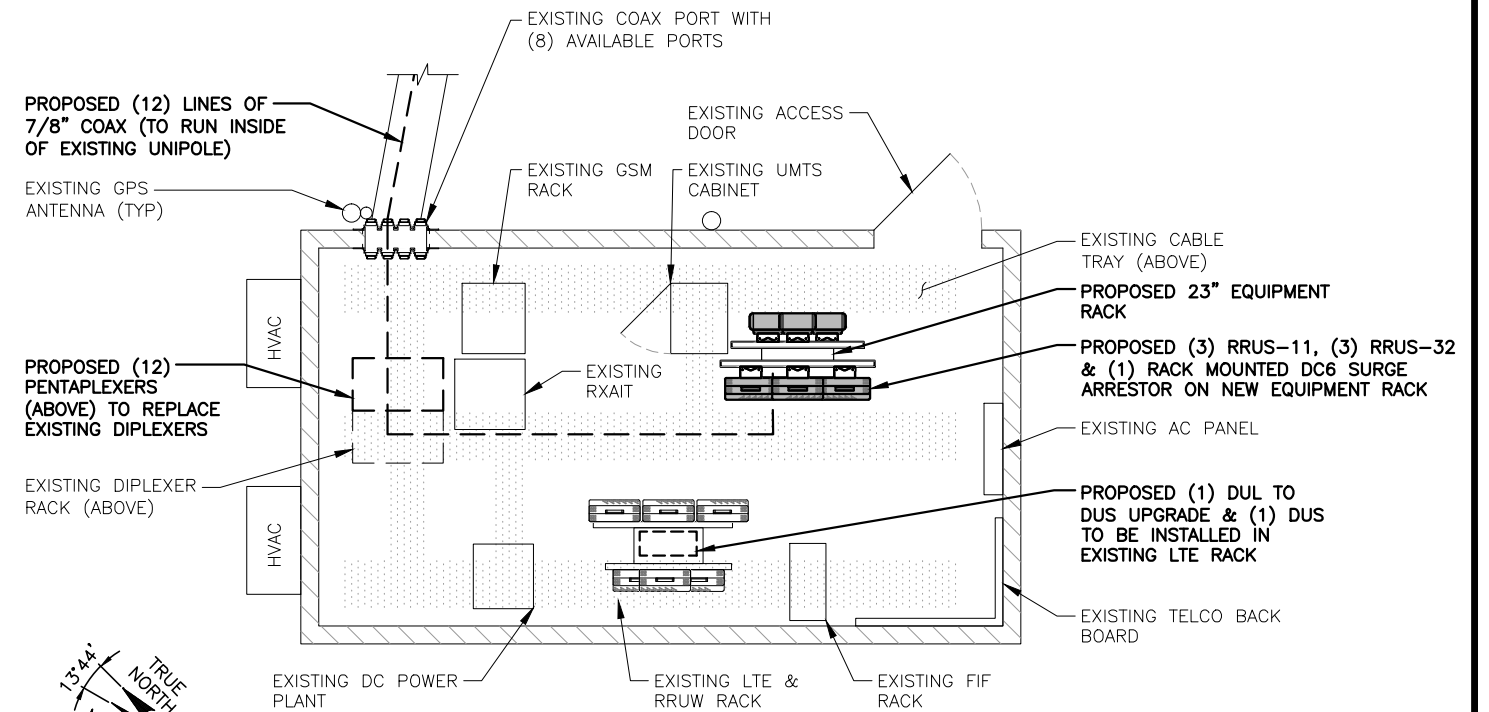
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EXISTING EQUIPMENT PLAN
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

2
A-1

0 1'-4" 2'-8" 5'-4" 8'-0"



PROPOSED EQUIPMENT PLAN
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

3
A-1

0 1'-4" 2'-8" 5'-4" 8'-0"



1600 OSGOOD STREET
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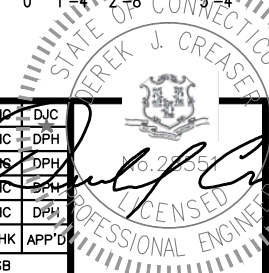
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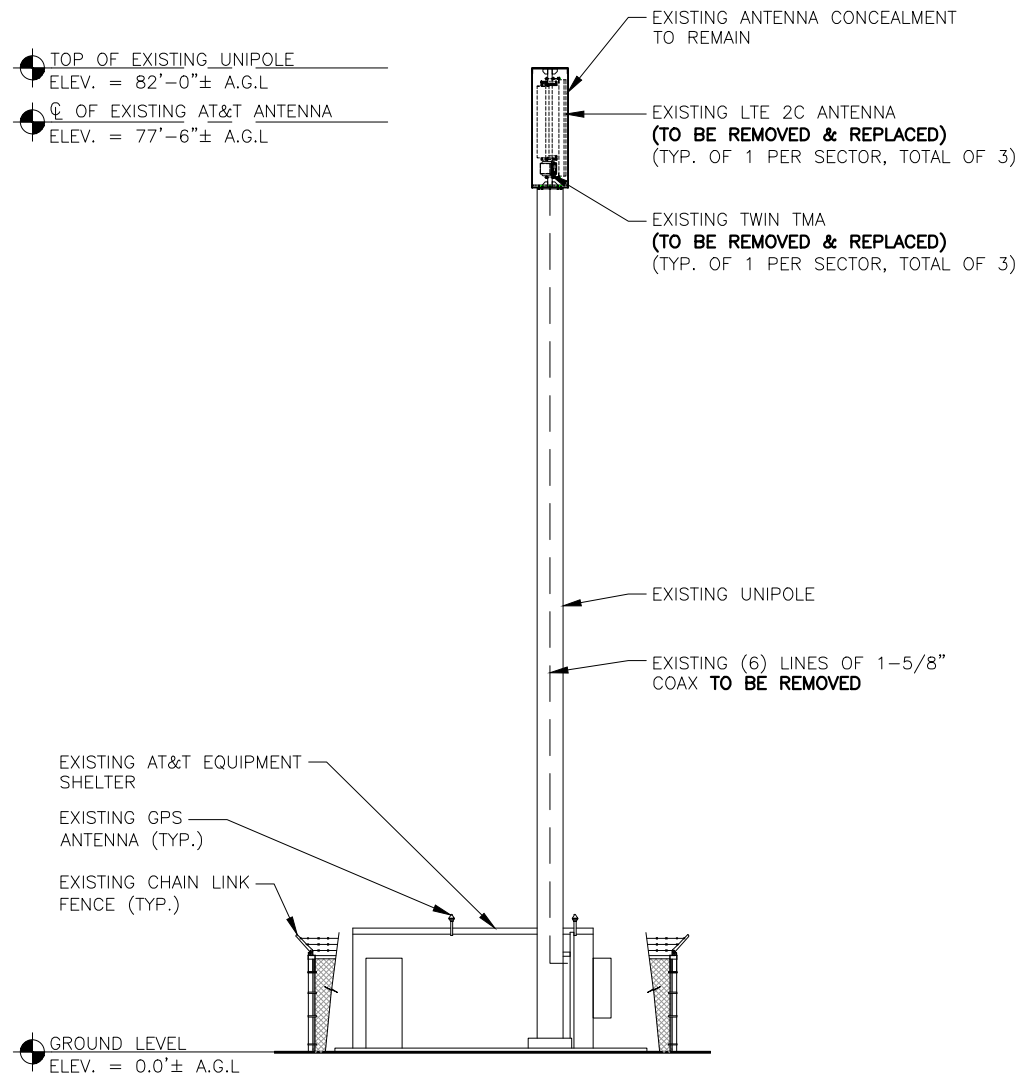
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NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SB		



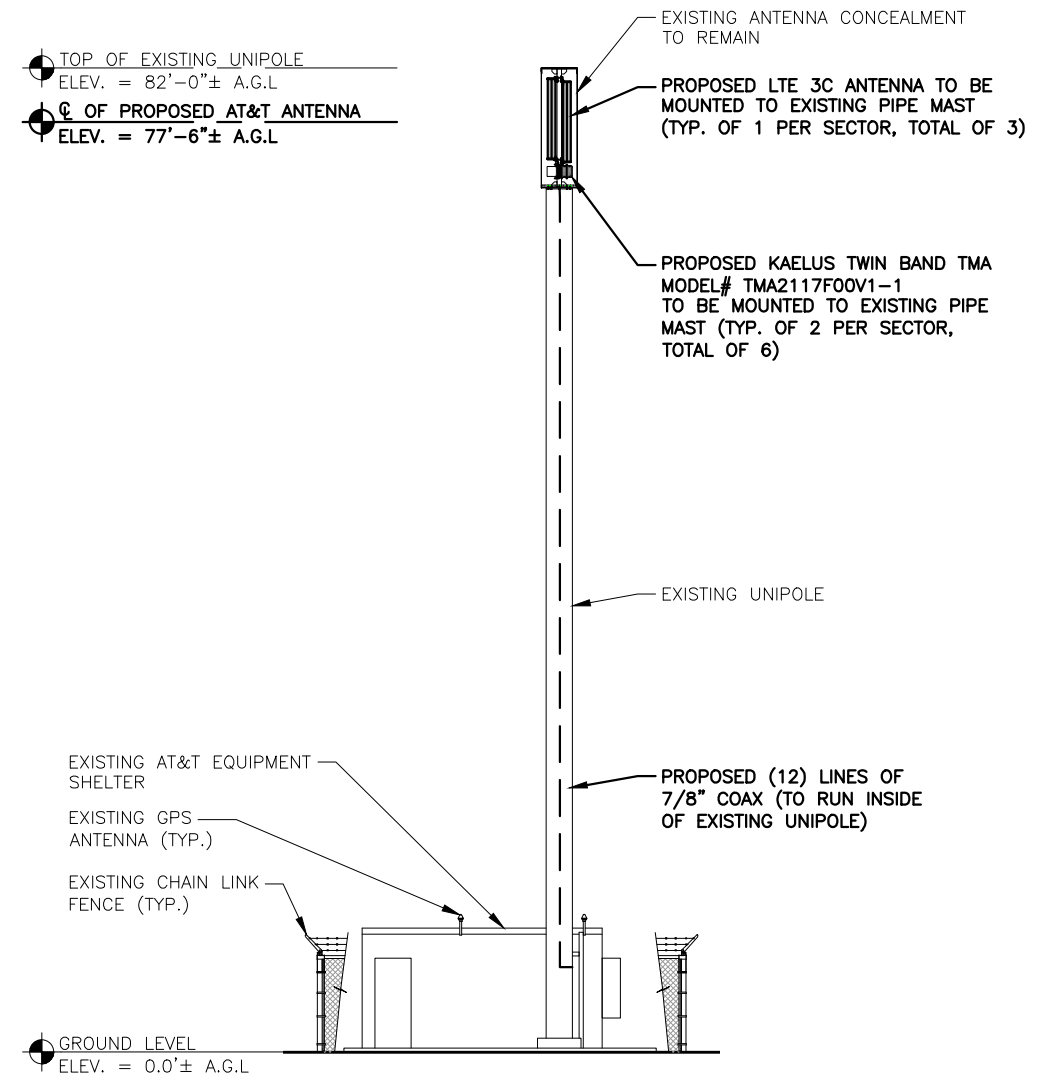
AT&T		
COMPOUND & EQUIPMENT PLANS (LTE 3C)		
SITE NUMBER	DRAWING NUMBER	REV
CTL05251	A-1	4

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

NOTE:
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



EXISTING NORTHEAST ELEVATION 1
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"



PROPOSED NORTHEAST ELEVATION 2
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

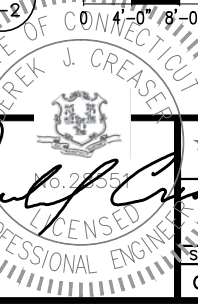
Hudson Design Group
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 309D
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL05251
SITE NAME: SOUTHINGTON INDUSTRIAL CENTER
500 QUEEN STREET
SOUTHINGTON, CT 06489
HARTFORD COUNTY

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

4	06/09/17	REVISED FOR CONSTRUCTION	JC	HC	DJC
3	08/19/16	REVISED FOR CONSTRUCTION	RP	HC	DPH
2	06/27/16	REVISED FOR CONSTRUCTION	SB	HC	DPH
1	06/01/16	ISSUED FOR CONSTRUCTION	SB	HC	DPH
0	05/24/16	ISSUED FOR REVIEW	SB	HC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: HC	DRAWN BY: SB	

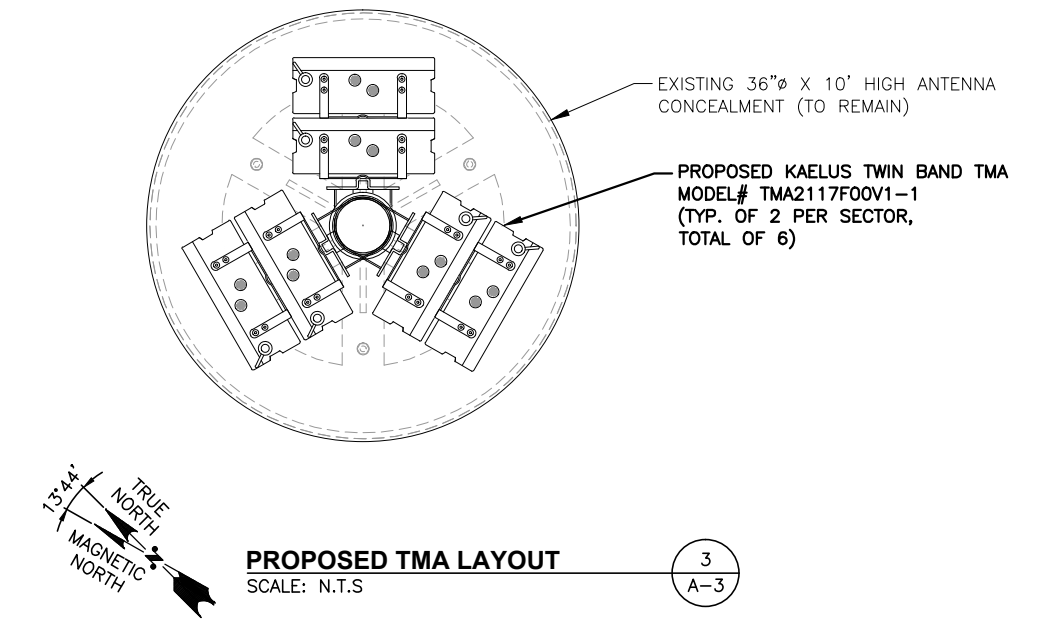
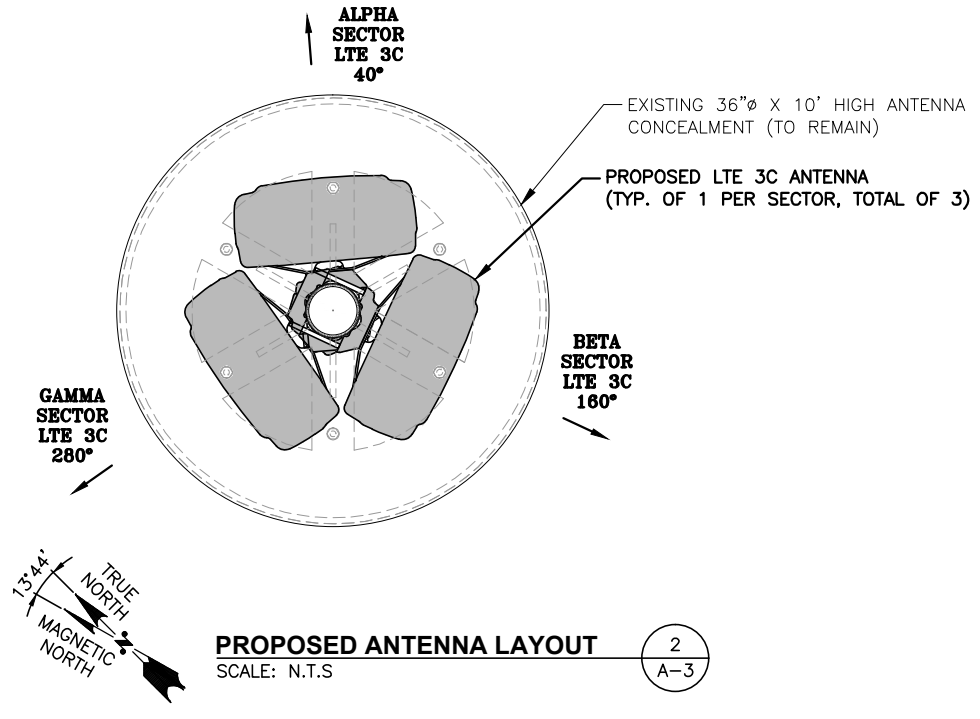
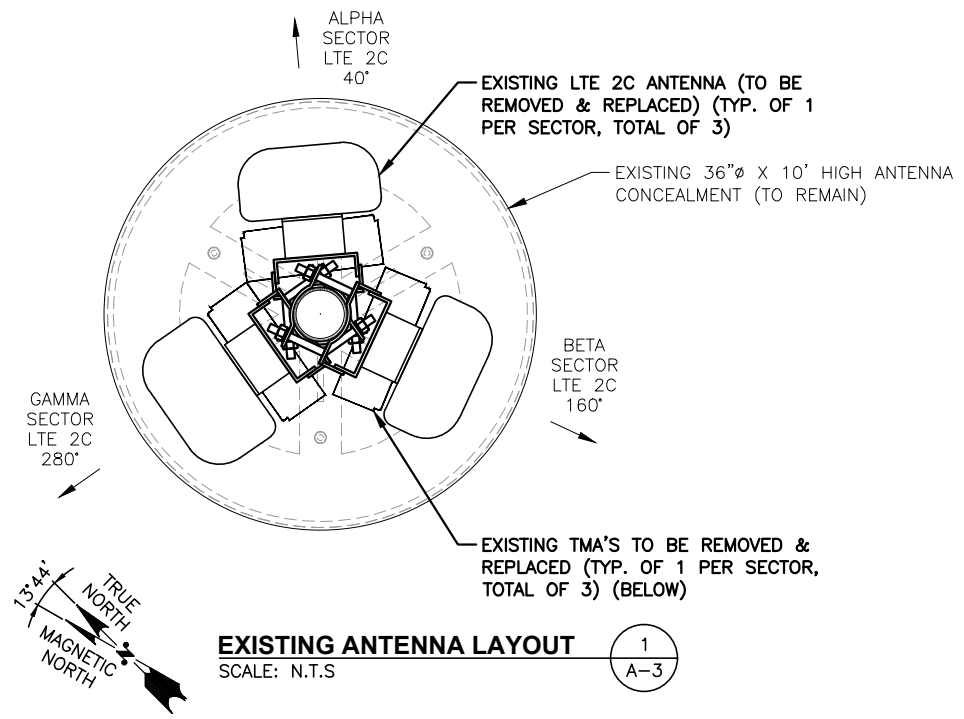


AT&T	
ELEVATIONS (LTE 3C)	
SITE NUMBER	DRAWING NUMBER
CTL05251	A-2
REV	4

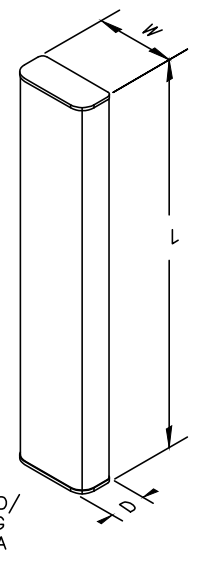
EXISTING & PROPOSED ANTENNA AND RRH SCHEDULE											
SECTOR	TECHNOLOGY	EXISTING/PROPOSED	RAD CENTER	AZIMUTH	MAKE	MODEL#	SIZE (INCHES) (L x W x D)	EXISTING/PROPOSED	MAKE	MODEL#	SIZE (INCHES) (L x W x D)
ALPHA	LTE 3C	PROPOSED	77'-6"±	40°	KATHERIN	800-10891	78.5x14.8x6.7	PROPOSED (SHELTER) EXISTING (SHELTER) PROPOSED (SHELTER)	ERICSSON ERICSSON ERICSSON	RRUS-11 RRUS-12 RRUS-32	19.7X17.0X7.2 20.4X18.5X7.5 27.2X12.1X7.0
BETA	LTE 3C	PROPOSED	77'-6"±	160°	KATHERIN	800-10891	78.5x14.8x6.7	PROPOSED (SHELTER) EXISTING (SHELTER) PROPOSED (SHELTER)	ERICSSON ERICSSON ERICSSON	RRUS-11 RRUS-12 RRUS-32	19.7X17.0X7.2 20.4X18.5X7.5 27.2X12.1X7.0
GAMMA	LTE 3C	PROPOSED	77'-6"±	280°	KATHERIN	800-10891	78.5x14.8x6.7	PROPOSED (SHELTER) EXISTING (SHELTER) PROPOSED (SHELTER)	ERICSSON ERICSSON ERICSSON	RRUS-11 RRUS-12 RRUS-32	19.7X17.0X7.2 20.4X18.5X7.5 27.2X12.1X7.0

NOTE:
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NOTE:
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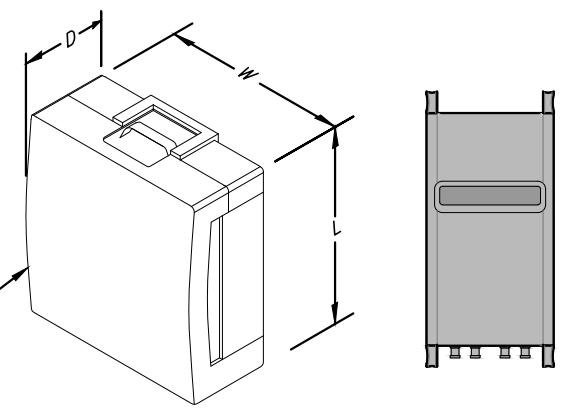
NOTES:
1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR



NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER

PROPOSED RRH—REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.



PROPOSED ANTENNA DETAIL
SCALE: N.T.S

4
A-3

PROPOSED RRH DETAIL
SCALE: N.T.S

5
A-3

Hudson Design Group
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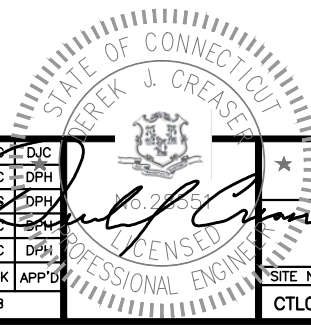
smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL05251
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500 QUEEN STREET
SOUTHTON, CT 06489
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	05/24/16	ISSUED FOR REVIEW	SB	HC	DPH

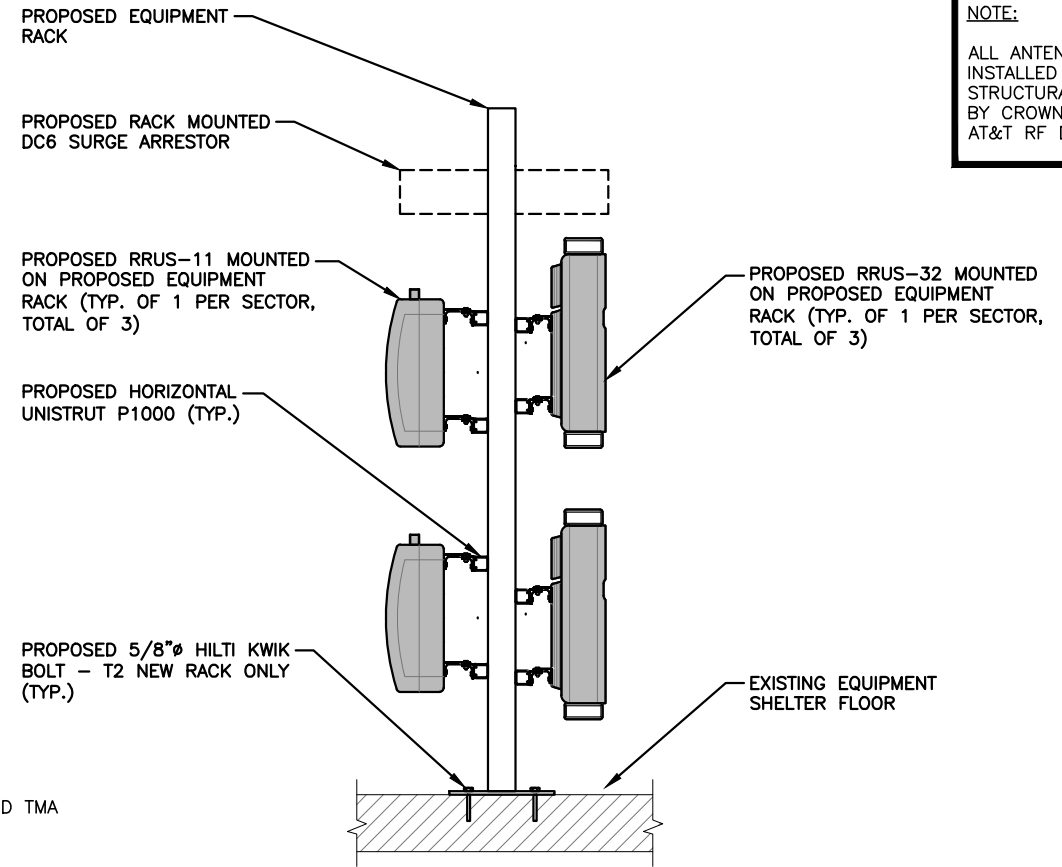
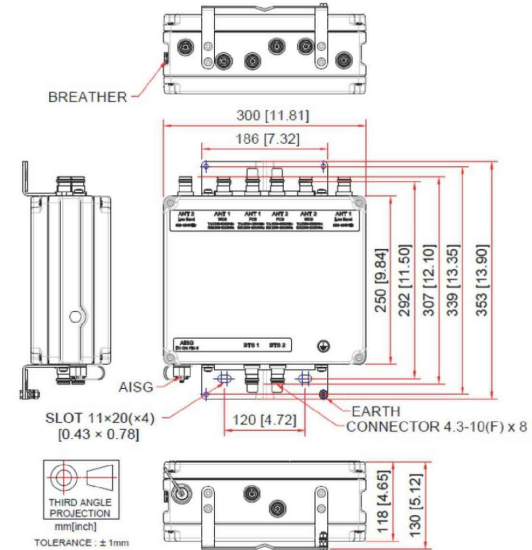
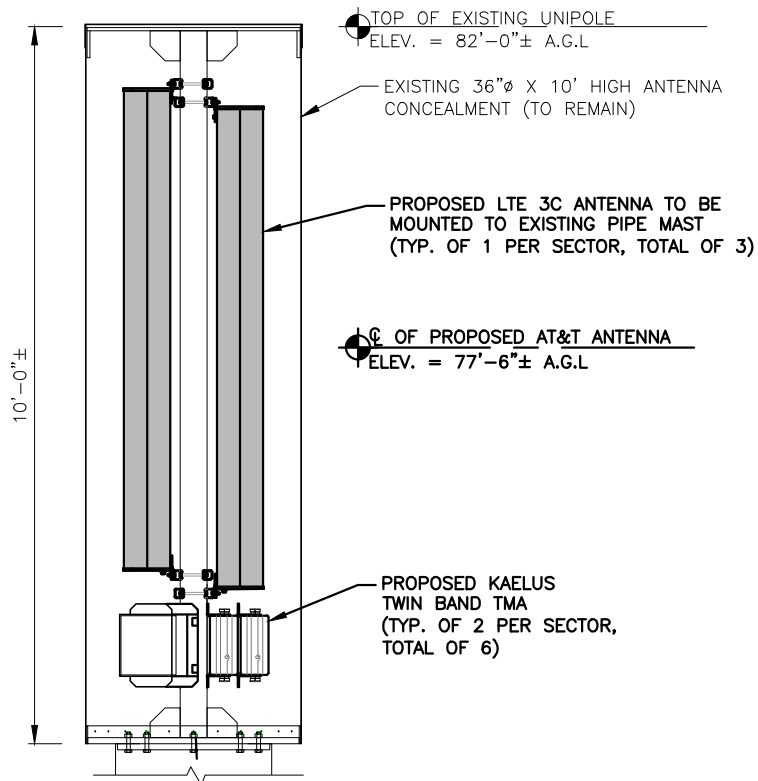
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AT&T
ANTENNA LAYOUTS & DETAILS (LTE 3C)
SITE NUMBER: CTL05251
DRAWING NUMBER: A-3
REV: 4

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

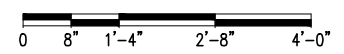
NOTE:
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



PROPOSED ANTENNA MOUNTING DETAIL 1
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

PROPOSED TMA DETAIL 2
SCALE: N.T.S.

PROPOSED RRH MOUNTING DETAIL 3
SCALE: N.T.S.



PROPOSED KAEIUS TWIN BAND TMA
MODEL# TMA2117F00V1-1

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

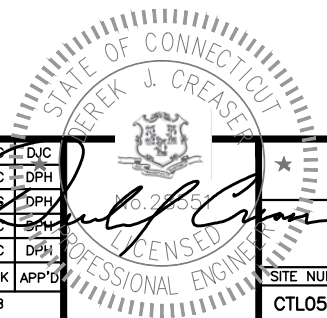
Hudson Design Group, Inc.
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BUILDING 20 NORTH, SUITE 309D
N. ANDOVER, MA 01845
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FAX: (978) 336-5586

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SITE NAME: SOUTHINGTON INDUSTRIAL CENTER
500 QUEEN STREET
SOUTHINGTON, CT 06489
HARTFORD COUNTY

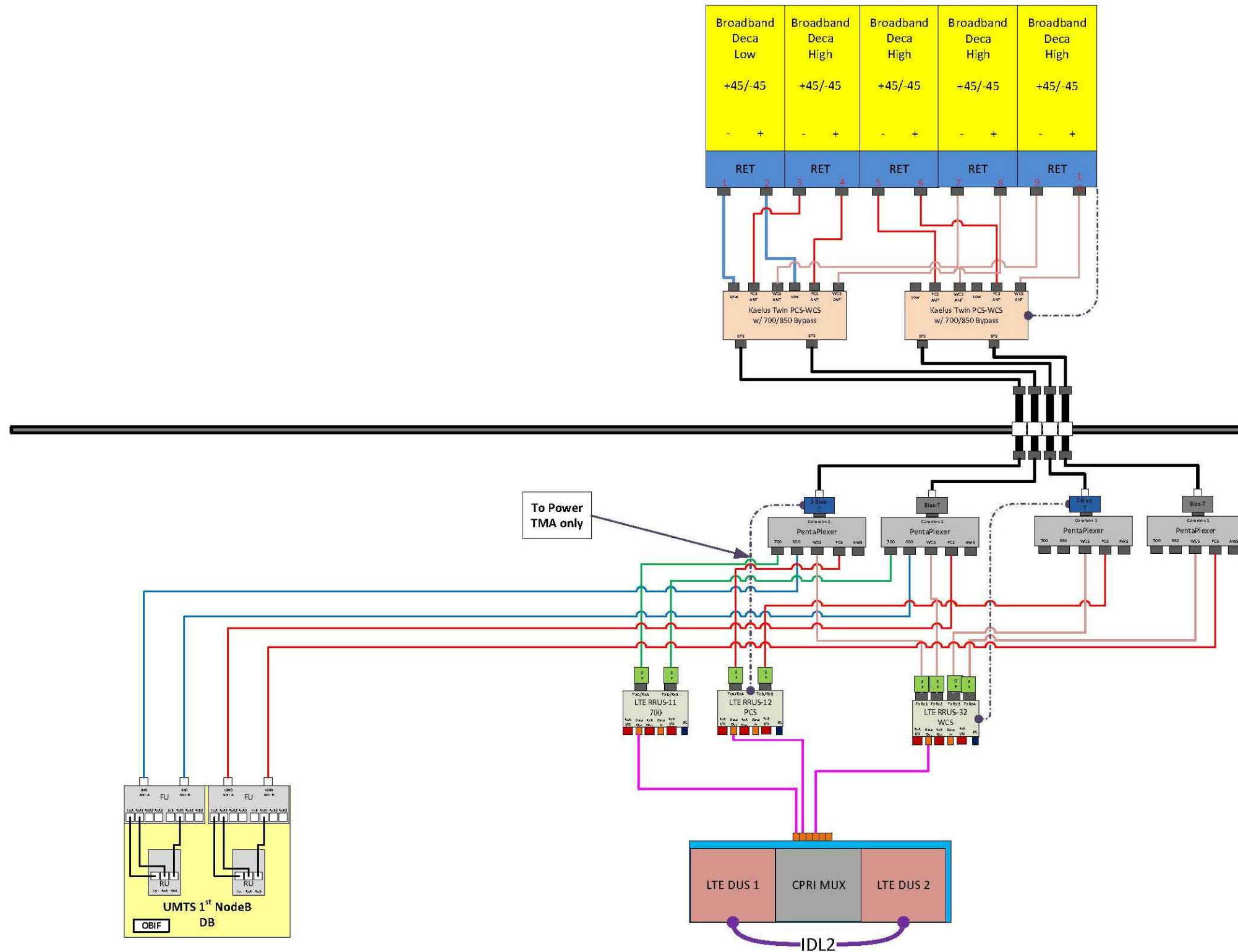
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AT&T	
DETAILS (LTE 3C)	
SITE NUMBER	DRAWING NUMBER
CTL05251	A-4
	REV
	4

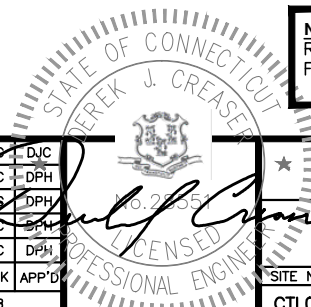
Antenna 1



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

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

RF PLUMBING DIAGRAM 1
 SCALE: N.T.S. RF-1



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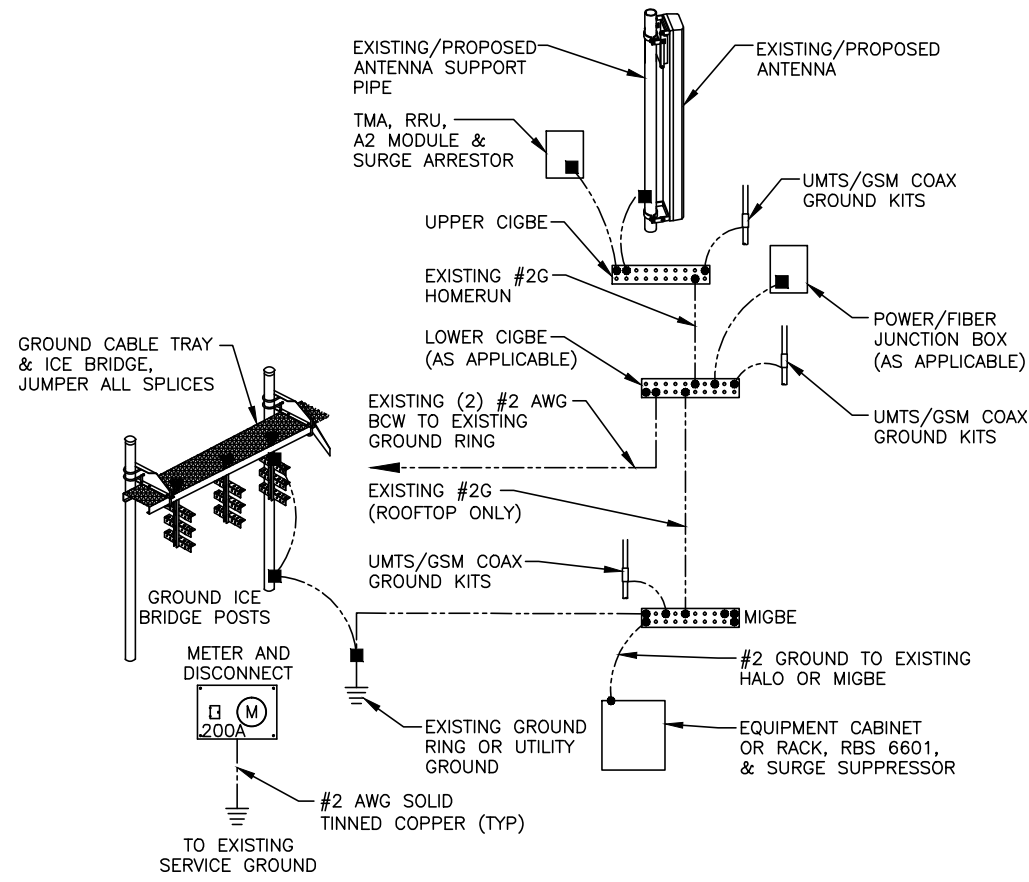
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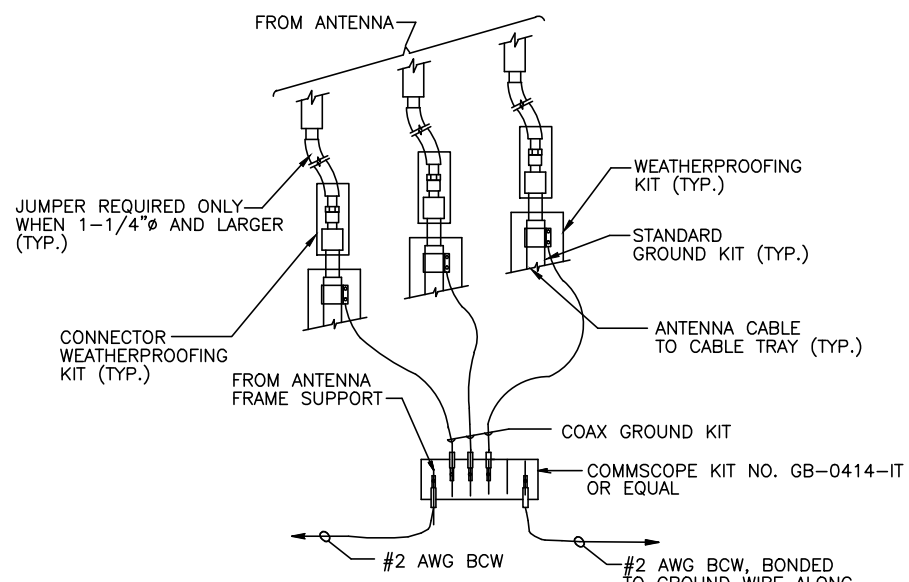
at&t
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 ROCKY HILL, CT 06067

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NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: HC	DRAWN BY: SB	

AT&T
RF PLUMBING DIAGRAM (LTE 3C)
 SITE NUMBER: CTL05251
 DRAWING NUMBER: RF-1
 REV: 4

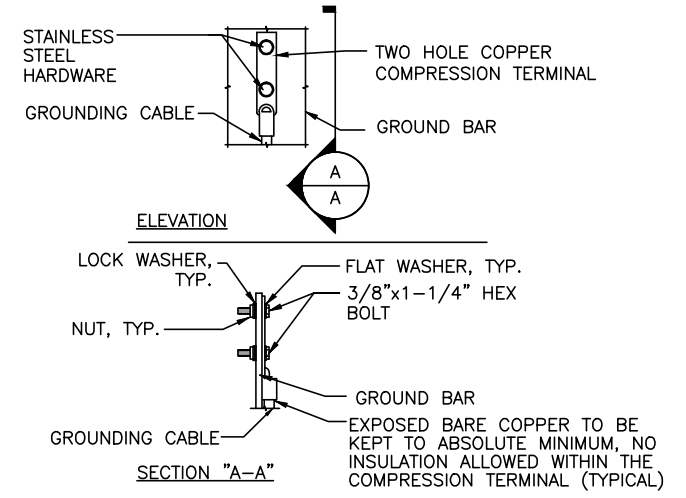


GROUNDING RISER DIAGRAM 1
SCALE: N.T.S. G-1



NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL 2
SCALE: N.T.S. G-1



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

TYPICAL GROUND BAR CONNECTION DETAIL 3
SCALE: N.T.S. G-1

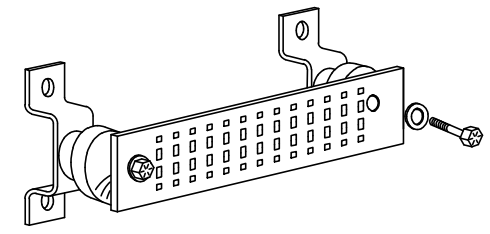
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PRODUCERS

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

SECTION "A" - SURGE ABSORBERS

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



GROUND BAR - DETAIL 4
SCALE: N.T.S. G-1

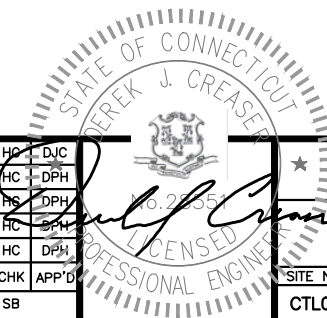
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0	05/24/16	ISSUED FOR REVIEW	SB	HC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: HC	DRAWN BY: SB	



AT&T
GROUNDING DETAILS (LTE 3C)
SITE NUMBER: CTL05251
DRAWING NUMBER: G-1
REV: 4



Date: May 22, 2017

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679
jjohnson@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: AT&T Mobility Co-Locate
Carrier Site Number: CTL05251
Carrier Site Name: Southington Industrial

Crown Castle Designation: Crown Castle BU Number: 821898
Crown Castle Site Name: Southington Industrial
Crown Castle JDE Job Number: 389544
Crown Castle Work Order Number: 1399731
Crown Castle Application Number: 357137 Rev. 17

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37517-1972.001.7805
(Stealth Flange)

Site Data: 500 Queen St, Southington, Hartford County, CT
Latitude 41° 37' 48.54", Longitude -72° 52' 29.98"
94 Foot - Monopole Tower

Dear Andrew Bazinet,

Paul J. Ford and Company is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1032182, in accordance with application 357137, revision 17.


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

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

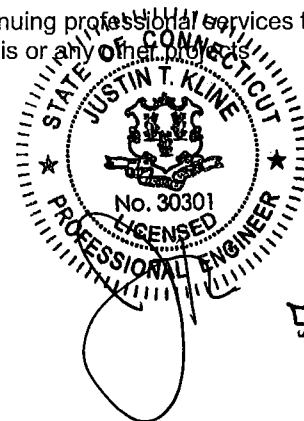
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 were used in this analysis.

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

Respectfully submitted by:


Joshua Johnson, EI
Structural Designer

tnxTower Report - version 7.0.5.1



5-22-17

Date: **May 22, 2017**

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679
jjohnson@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CTL05251
Carrier Site Name: Southington Industrial

Crown Castle Designation: **Crown Castle BU Number:** 821898
Crown Castle Site Name: Southington Industrial
Crown Castle JDE Job Number: 389544
Crown Castle Work Order Number: 1399731
Crown Castle Application Number: 357137 Rev. 17

Engineering Firm Designation: **Paul J. Ford and Company Project Number:** 37517-1972.001.7805
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LC5: Existing + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing loading, respectively.

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We at *Paul J. Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Joshua Johnson, EI
Structural Designer

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Table 4 - Documents Provided

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3.2) Assumptions

4) ANALYSIS RESULTS

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Table 6 – Tower Components vs. Capacity

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tnxTower Output

6) APPENDIX B

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7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 94 ft Monopole tower designed by Stealth in August of 2003. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
77.0	78.0	3	kathrein	80010891	12	7/8	--
	74.0	3	kaelus	TMA2117F00V1-1			
	73.0	3	kaelus	TMA2117F00V1-1			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
77.0	78.0	2	kmw communication	AM-X-CD-16-65-00T-RET	6	1-5/8	2
		2	cci antennas	DTMABP7819VG12A			
	77.0	1	andrew	SBNH-1D6565C			
		1	cci antennas	DTMABP7819VG12A			
		1	--	36" Dia x 10' Concealment			

Notes:

- 1) Existing Equipment
- 2) Equipment to be Removed

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welte, 11/24/2008	5688074	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	URS, 36928485.00000, 03/02/2009	5688077	CCISITES
4-TOWER MAPPING (CONCEALMENT)	TEP, 61471_33415, 06/15/2015	5688078	CCISITES
4-TOWER MANUFACTURER DRAWINGS (BASE POLE)	PJF, 31903-0050, 08/18/2003		

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The concealment manufacturer drawings are not available at the time of this analysis. Therefore, we have assumed concealment spine and concealment flange plate steel yield strength(s) (F_y) as shown in the attached calculations. Flange bolts were assumed to be A325.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	82 - 72	Pole	P5.563x0.258	1	-0.74	135.45	24.0	Pass
L2	72 - 40	Pole	P26x0.25	2	-3.78	617.06	16.8	Pass
L3	40 - 0	Pole	P26x0.312	3	-8.10	793.13	43.5	Pass
							Summary	
						Pole (L3)	43.5	Pass
						RATING =	43.5	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	32.9	Pass
1	Base Plate	0	25.7	Pass
1	Base Foundation Soil Interaction	0	9.8	Pass
1	Base Foundation Structural Steel	0	2.0	Pass
1	Flange Connection	40	31.4	Pass
1	Flange Connection	72	61.2	Pass

Structure Rating (max from all components) =	61.2%
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Notes:

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

4.1) Recommendations

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

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
 This tower is designed using the TIA-222-G standard.
 The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- 3) Basic wind speed of 97.00 mph.
- 4) Structure Class II.
- 5) Exposure Category C.
- 6) Topographic Category 1.
- 7) Crest Height 0.0000 ft.
- 8) Nominal ice thickness of 1.0000 in.
- 9) Ice thickness is considered to increase with height.
- 10) Ice density of 56.00 pcf.
- 11) A wind speed of 50.00 mph is used in combination with ice.
- 12) Temperature drop of 50.00 °F.
- 13) Deflections calculated using a wind speed of 60.00 mph.
- 14) A non-linear (P-delta) analysis was used.
- 15) Pressures are calculated at each section.
- 16) Stress ratio used in pole design is 1.
- 17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	82.0000-72.0000	10.0000	P5.563x0.258	A53-B-35 (35 ksi)	
L2	72.0000-40.0000	32.0000	P26x0.25	A53-B-35 (35 ksi)	
L3	40.0000-0.0000	40.0000	P26x0.312	A53-B-35 (35 ksi)	

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
AVA5-50FX(7/8)	C	No	Inside Pole	77.0000 - 0.0000	12	No Ice	0.0000	0.31
						1/2" Ice	0.0000	0.31
						1" Ice	0.0000	0.31

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	82.0000-72.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L2	72.0000-40.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.12
L3	40.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	82.0000-72.0000	A	2.177	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.02
L2	72.0000-40.0000	A	2.110	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.12
L3	40.0000-0.0000	A	1.909	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.15

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	82.0000-72.0000	0.0000	0.0000	0.0000	0.0000
L2	72.0000-40.0000	0.0000	0.0000	0.0000	0.0000
L3	40.0000-0.0000	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K

**								

80010891	A	From Leg	0.5000 0.00 1.00	0.0000	77.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.08 0.14 0.21
80010891	B	From Leg	0.5000 0.00 1.00	0.0000	77.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.08 0.14 0.21

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} _{Front} ft ²	C _{AA} _{Side} ft ²	Weight K
80010891	C	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.08
			0.00			1/2"	0.0000	0.0000	0.14
			1.00			Ice	0.0000	0.0000	0.21
TMA2117F00V1-1	A	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-3.00			Ice	0.0000	0.0000	0.03
TMA2117F00V1-1	B	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-3.00			Ice	0.0000	0.0000	0.03
TMA2117F00V1-1	C	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-3.00			Ice	0.0000	0.0000	0.03
TMA2117F00V1-1	A	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-4.00			Ice	0.0000	0.0000	0.03
TMA2117F00V1-1	B	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-4.00			Ice	0.0000	0.0000	0.03
TMA2117F00V1-1	C	From Leg	0.5000	0.0000	77.0000	No Ice	0.0000	0.0000	0.02
			0.00			1/2"	0.0000	0.0000	0.02
			-4.00			Ice	0.0000	0.0000	0.03
Canister Load1	C	None		0.0000	82.0000	No Ice	9.0000	9.0000	0.09
						1/2"	18.5000	18.5000	0.21
						Ice	19.0000	19.0000	0.32
Canister Load2	C	None		0.0000	72.0000	No Ice	9.0000	9.0000	0.24
						1/2"	18.5000	18.5000	0.35
						Ice	19.0000	19.0000	0.46
						1" Ice			

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} _{In} Face ft ²	C _{AA} _{Out} Face ft ²
L1 82.0000-72.0000	77.0000	1.198	27.41	4.636	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 72.0000-40.0000	56.2422	1.121	25.59	69.333	A	0.000	69.333	69.333	100.00	0.000	0.000
					B	0.000	69.333		100.00	0.000	0.000
					C	0.000	69.333		100.00	0.000	0.000
L3 40.0000-0.0000	20.7218	0.909	20.96	86.667	A	0.000	86.667	86.667	100.00	0.000	0.000
					B	0.000	86.667		100.00	0.000	0.000
					C	0.000	86.667		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 82.0000-72.0000	77.0000	1.198	7.28	2.1768	8.264	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000	0.00	0.000	0.000	
						C	0.000	0.000	0.00	0.000	0.000	
L2 72.0000-40.0000	56.2422	1.121	6.80	2.1095	80.584	A	0.000	80.584	80.584	100.00	0.000	0.000
						B	0.000	80.584	100.00	0.000	0.000	
						C	0.000	80.584	100.00	0.000	0.000	
L3 40.0000-0.0000	20.7218	0.909	5.57	1.9091	99.394	A	0.000	99.394	99.394	100.00	0.000	0.000
						B	0.000	99.394	100.00	0.000	0.000	
						C	0.000	99.394	100.00	0.000	0.000	

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 82.0000-72.0000	77.0000	1.198	9.38	4.636	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000	0.00	0.000	0.000	
					C	0.000	0.000	0.00	0.000	0.000	
L2 72.0000-40.0000	56.2422	1.121	8.76	69.333	A	0.000	69.333	69.333	100.00	0.000	0.000
					B	0.000	69.333	100.00	0.000	0.000	
					C	0.000	69.333	100.00	0.000	0.000	
L3 40.0000-0.0000	20.7218	0.909	7.18	86.667	A	0.000	86.667	86.667	100.00	0.000	0.000
					B	0.000	86.667	100.00	0.000	0.000	
					C	0.000	86.667	100.00	0.000	0.000	

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	82 - 72	Pole	Max Tension	39	0.00	0.00	-0.00
			Max. Compression	26	-2.68	0.00	0.00
			Max. Mx	8	-0.74	-4.48	0.00
			Max. My	2	-0.74	0.00	4.48
			Max. Vy	8	0.45	-2.67	0.00
			Max. Vx	2	-0.45	0.00	2.67
L2	72 - 40	Pole	Max. Torque	4			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.58	0.00	0.00
			Max. Mx	8	-3.78	-63.78	0.00
			Max. My	2	-3.78	0.00	63.78
			Max. Vy	8	2.79	-63.78	0.00
L3	40 - 0	Pole	Max. Torque	4			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.47	0.00	0.00
			Max. Mx	8	-8.10	-214.81	0.00
			Max. My	2	-8.10	0.00	214.81
			Max. Vy	8	4.66	-214.81	0.00
			Max. Vx	2	-4.66	0.00	214.81
			Max. Torque	4			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	15.47	0.00	0.00
	Max. H _x	20	8.11	4.66	0.00
	Max. H _z	2	8.11	0.00	4.66
	Max. M _x	2	214.81	0.00	4.66
	Max. M _z	8	214.81	-4.66	0.00
	Max. Torsion	12	0.00	-2.33	-4.04
	Min. Vert	9	6.08	-4.66	0.00
	Min. H _x	8	8.11	-4.66	0.00
	Min. H _z	14	8.11	0.00	-4.66
	Min. M _x	14	-214.81	0.00	-4.66
	Min. M _z	20	-214.81	4.66	0.00
	Min. Torsion	4	-0.00	-2.33	4.04

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	6.75	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	8.11	0.00	-4.66	-214.81	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	6.08	0.00	-4.66	-214.08	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	8.11	2.33	-4.04	-186.01	-107.39	0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	6.08	2.33	-4.04	-185.40	-107.04	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	8.11	4.04	-2.33	-107.39	-186.01	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	6.08	4.04	-2.33	-107.04	-185.40	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	8.11	4.66	0.00	0.00	-214.81	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	6.08	4.66	0.00	0.00	-214.08	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	8.11	4.04	2.33	107.39	-186.01	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	6.08	4.04	2.33	107.04	-185.40	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	8.11	2.33	4.04	186.01	-107.39	-0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	6.08	2.33	4.04	185.40	-107.04	-0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	8.11	0.00	4.66	214.81	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	6.08	0.00	4.66	214.08	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	8.11	-2.33	4.04	186.01	107.39	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	6.08	-2.33	4.04	185.40	107.04	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	8.11	-4.04	2.33	107.39	186.01	-0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	6.08	-4.04	2.33	107.04	185.40	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	8.11	-4.66	0.00	0.00	214.81	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	6.08	-4.66	0.00	0.00	214.08	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	8.11	-4.04	-2.33	-107.39	186.01	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	6.08	-4.04	-2.33	-107.04	185.40	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	8.11	-2.33	-4.04	-186.01	107.39	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	6.08	-2.33	-4.04	-185.40	107.04	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	15.47	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	15.47	0.00	-1.78	-83.21	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	15.47	0.89	-1.54	-72.06	-41.61	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	15.47	1.54	-0.89	-41.61	-72.06	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	15.47	1.78	0.00	0.00	-83.21	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	15.47	1.54	0.89	41.61	-72.06	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	15.47	0.89	1.54	72.06	-41.61	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	15.47	0.00	1.78	83.21	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	15.47	-0.89	1.54	72.06	41.61	0.00

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	15.47	-1.54	0.89	41.61	72.06	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	15.47	-1.78	0.00	0.00	83.21	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	15.47	-1.54	-0.89	-41.61	72.06	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	15.47	-0.89	-1.54	-72.06	41.61	0.00
Dead+Wind 0 deg - Service	6.75	0.00	-1.00	-45.84	0.00	0.00
Dead+Wind 30 deg - Service	6.75	0.50	-0.86	-39.70	-22.92	0.00
Dead+Wind 60 deg - Service	6.75	0.86	-0.50	-22.92	-39.70	0.00
Dead+Wind 90 deg - Service	6.75	1.00	0.00	0.00	-45.84	0.00
Dead+Wind 120 deg - Service	6.75	0.86	0.50	22.92	-39.70	0.00
Dead+Wind 150 deg - Service	6.75	0.50	0.86	39.70	-22.92	0.00
Dead+Wind 180 deg - Service	6.75	0.00	1.00	45.84	0.00	0.00
Dead+Wind 210 deg - Service	6.75	-0.50	0.86	39.70	22.92	0.00
Dead+Wind 240 deg - Service	6.75	-0.86	0.50	22.92	39.70	0.00
Dead+Wind 270 deg - Service	6.75	-1.00	0.00	0.00	45.84	0.00
Dead+Wind 300 deg - Service	6.75	-0.86	-0.50	-22.92	39.70	0.00
Dead+Wind 330 deg - Service	6.75	-0.50	-0.86	-39.70	22.92	0.00

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-6.75	0.00	0.00	6.75	0.00	0.000%
2	0.00	-8.11	-4.66	0.00	8.11	4.66	0.003%
3	0.00	-6.08	-4.66	0.00	6.08	4.66	0.007%
4	2.33	-8.11	-4.04	-2.33	8.11	4.04	0.008%
5	2.33	-6.08	-4.04	-2.33	6.08	4.04	0.007%
6	4.04	-8.11	-2.33	-4.04	8.11	2.33	0.008%
7	4.04	-6.08	-2.33	-4.04	6.08	2.33	0.007%
8	4.66	-8.11	0.00	-4.66	8.11	0.00	0.003%
9	4.66	-6.08	0.00	-4.66	6.08	0.00	0.007%
10	4.04	-8.11	2.33	-4.04	8.11	-2.33	0.008%
11	4.04	-6.08	2.33	-4.04	6.08	-2.33	0.007%
12	2.33	-8.11	4.04	-2.33	8.11	-4.04	0.008%
13	2.33	-6.08	4.04	-2.33	6.08	-4.04	0.007%
14	0.00	-8.11	4.66	0.00	8.11	-4.66	0.003%
15	0.00	-6.08	4.66	0.00	6.08	-4.66	0.007%
16	-2.33	-8.11	4.04	2.33	8.11	-4.04	0.008%
17	-2.33	-6.08	4.04	2.33	6.08	-4.04	0.007%
18	-4.04	-8.11	2.33	4.04	8.11	-2.33	0.008%
19	-4.04	-6.08	2.33	4.04	6.08	-2.33	0.007%
20	-4.66	-8.11	0.00	4.66	8.11	0.00	0.003%
21	-4.66	-6.08	0.00	4.66	6.08	0.00	0.007%
22	-4.04	-8.11	-2.33	4.04	8.11	2.33	0.008%
23	-4.04	-6.08	-2.33	4.04	6.08	2.33	0.007%
24	-2.33	-8.11	-4.04	2.33	8.11	4.04	0.008%
25	-2.33	-6.08	-4.04	2.33	6.08	4.04	0.007%
26	0.00	-15.47	0.00	0.00	15.47	0.00	0.000%
27	0.00	-15.47	-1.78	0.00	15.47	1.78	0.002%
28	0.89	-15.47	-1.54	-0.89	15.47	1.54	0.002%
29	1.54	-15.47	-0.89	-1.54	15.47	0.89	0.002%
30	1.78	-15.47	0.00	-1.78	15.47	0.00	0.002%
31	1.54	-15.47	0.89	-1.54	15.47	-0.89	0.002%
32	0.89	-15.47	1.54	-0.89	15.47	-1.54	0.002%
33	0.00	-15.47	1.78	0.00	15.47	-1.78	0.002%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
34	-0.89	-15.47	1.54	0.89	15.47	-1.54	0.002%
35	-1.54	-15.47	0.89	1.54	15.47	-0.89	0.002%
36	-1.78	-15.47	0.00	1.78	15.47	0.00	0.002%
37	-1.54	-15.47	-0.89	1.54	15.47	0.89	0.002%
38	-0.89	-15.47	-1.54	0.89	15.47	1.54	0.002%
39	0.00	-6.75	-1.00	0.00	6.75	1.00	0.005%
40	0.50	-6.75	-0.86	-0.50	6.75	0.86	0.005%
41	0.86	-6.75	-0.50	-0.86	6.75	0.50	0.005%
42	1.00	-6.75	0.00	-1.00	6.75	0.00	0.005%
43	0.86	-6.75	0.50	-0.86	6.75	-0.50	0.005%
44	0.50	-6.75	0.86	-0.50	6.75	-0.86	0.005%
45	0.00	-6.75	1.00	0.00	6.75	-1.00	0.005%
46	-0.50	-6.75	0.86	0.50	6.75	-0.86	0.005%
47	-0.86	-6.75	0.50	0.86	6.75	-0.50	0.005%
48	-1.00	-6.75	0.00	1.00	6.75	0.00	0.005%
49	-0.86	-6.75	-0.50	0.86	6.75	0.50	0.005%
50	-0.50	-6.75	-0.86	0.50	6.75	0.86	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00000001	0.00007248
3	Yes	11	0.00000001	0.00014986
4	Yes	11	0.00000001	0.00013900
5	Yes	11	0.00000001	0.00012404
6	Yes	11	0.00000001	0.00013900
7	Yes	11	0.00000001	0.00012404
8	Yes	12	0.00000001	0.00007248
9	Yes	11	0.00000001	0.00014986
10	Yes	11	0.00000001	0.00013900
11	Yes	11	0.00000001	0.00012404
12	Yes	11	0.00000001	0.00013900
13	Yes	11	0.00000001	0.00012404
14	Yes	12	0.00000001	0.00007248
15	Yes	11	0.00000001	0.00014986
16	Yes	11	0.00000001	0.00013900
17	Yes	11	0.00000001	0.00012404
18	Yes	11	0.00000001	0.00013900
19	Yes	11	0.00000001	0.00012404
20	Yes	12	0.00000001	0.00007248
21	Yes	11	0.00000001	0.00014986
22	Yes	11	0.00000001	0.00013900
23	Yes	11	0.00000001	0.00012404
24	Yes	11	0.00000001	0.00013900
25	Yes	11	0.00000001	0.00012404
26	Yes	6	0.00000001	0.00000001
27	Yes	12	0.00000001	0.00009643
28	Yes	12	0.00000001	0.00010086
29	Yes	12	0.00000001	0.00010086
30	Yes	12	0.00000001	0.00009643
31	Yes	12	0.00000001	0.00010086
32	Yes	12	0.00000001	0.00010086
33	Yes	12	0.00000001	0.00009643
34	Yes	12	0.00000001	0.00010086
35	Yes	12	0.00000001	0.00010086
36	Yes	12	0.00000001	0.00009643
37	Yes	12	0.00000001	0.00010086
38	Yes	12	0.00000001	0.00010086
39	Yes	10	0.00000001	0.00008876
40	Yes	10	0.00000001	0.00008748
41	Yes	10	0.00000001	0.00008748
42	Yes	10	0.00000001	0.00008876
43	Yes	10	0.00000001	0.00008748
44	Yes	10	0.00000001	0.00008748
45	Yes	10	0.00000001	0.00008876

46	Yes	10	0.00000001	0.00008748
47	Yes	10	0.00000001	0.00008748
48	Yes	10	0.00000001	0.00008876
49	Yes	10	0.00000001	0.00008748
50	Yes	10	0.00000001	0.00008748

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	82 - 72	2.490	39	0.2785	0.0000
L2	72 - 40	1.969	39	0.1892	0.0000
L3	40 - 0	0.775	39	0.1555	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
82.0000	Canister Load1	39	2.490	0.2785	0.0000	28425
77.0000	80010891	39	2.224	0.2297	0.0000	28425
72.0000	Canister Load2	39	1.969	0.1892	0.0000	15655

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	82 - 72	11.669	2	1.3049	0.0000
L2	72 - 40	9.227	2	0.8868	0.0000
L3	40 - 0	3.633	2	0.7290	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
82.0000	Canister Load1	2	11.669	1.3049	0.0000	6072
77.0000	80010891	2	10.423	1.0764	0.0000	6072
72.0000	Canister Load2	2	9.227	0.8868	0.0000	3344

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	82 - 72 (1)	P5.563x0.258	10.000	0.0000	0.0	4.2999	-0.74	135.45	0.005
L2	72 - 40 (2)	P26x0.25	32.000	0.0000	0.0	20.224	-3.78	617.06	0.006
L3	40 - 0 (3)	P26x0.312	40.000	0.0000	0.0	25.178	-8.10	793.13	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	82 - 72 (1)	P5.563x0.258	4.48	19.07	0.235	0.00	19.07	0.000
L2	72 - 40 (2)	P26x0.25	63.78	394.32	0.162	0.00	394.32	0.000
L3	40 - 0 (3)	P26x0.312	214.81	505.75	0.425	0.00	505.75	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	82 - 72 (1)	P5.563x0.258	0.45	67.72	0.007	0.00	28.62	0.000
L2	72 - 40 (2)	P26x0.25	2.79	308.53	0.009	0.00	655.75	0.000
L3	40 - 0 (3)	P26x0.312	4.66	396.57	0.012	0.00	838.85	0.000

Pole Interaction Design Data

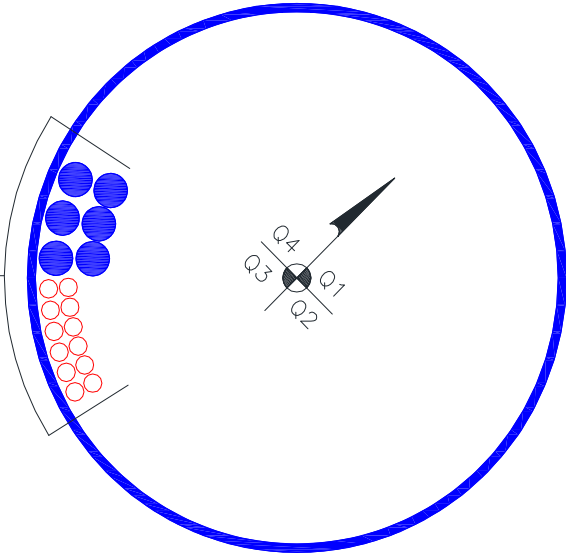
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	82 - 72 (1)	0.005	0.235	0.000	0.007	0.000	0.240	1.000	4.8.2 ✓
L2	72 - 40 (2)	0.006	0.162	0.000	0.009	0.000	0.168	1.000	4.8.2 ✓
L3	40 - 0 (3)	0.010	0.425	0.000	0.012	0.000	0.435	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	82 - 72	Pole	P5.563x0.258	1	-0.74	135.45	24.0	Pass
L2	72 - 40	Pole	P26x0.25	2	-3.78	617.06	16.8	Pass
L3	40 - 0	Pole	P26x0.312	3	-8.10	793.13	43.5	Pass
Summary								
Pole (L3)							43.5	Pass
RATING =							43.5	Pass

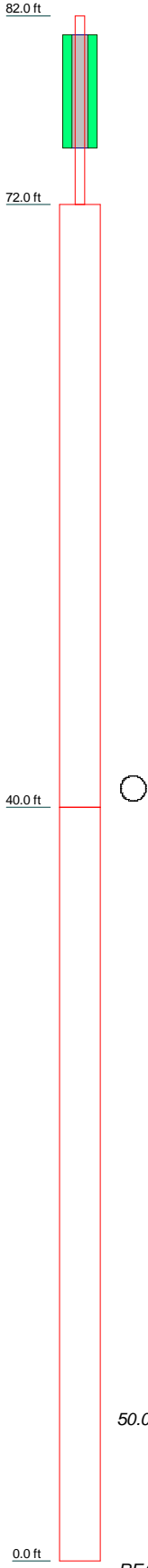
APPENDIX B
BASE LEVEL DRAWING

(PROPOSED)
(12) 7/8" TO 77 FT LEVEL
(INSTALLED—TO BE REMOVED)
(6) 1-5/8" TO 77 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1				
Size		P5.563x0.258			
Length (ft)		10.0000			
Grade			A53-B-35		
Weight (K)				0.1	
Section	2				
Size		P26x0.25			
Length (ft)		32.0000			
Grade			A53-B-35		
Weight (K)				2.2	
Section	3				
Size		P26x0.312			
Length (ft)		40.0000			
Grade			A53-B-35		
Weight (K)				3.4	
Section	4				
Size					
Length (ft)					
Grade					
Weight (K)				5.8	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Canister Load1	82	TMA2117F00V1-1	77
80010891	77	TMA2117F00V1-1	77
80010891	77	TMA2117F00V1-1	77
TMA2117F00V1-1	77	80010891	77
TMA2117F00V1-1	77	Canister Load2	72
TMA2117F00V1-1	77		

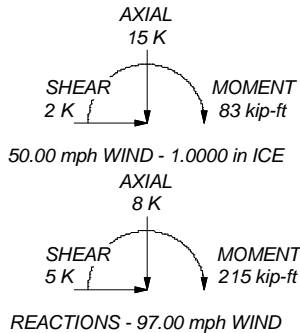
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97.00 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.00 mph basic wind with 1.00 in in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 43.5%

ALL REACTIONS ARE FACTORED



Paul J. Ford and Company
 250 East Broad St., Suite 600
 Columbus, Ohio
 Phone: 614.221.6679
 FAX:

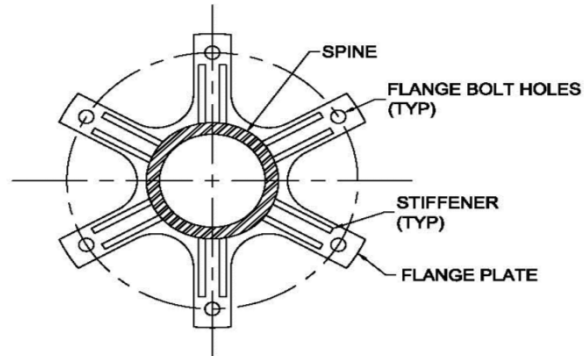
Job: **82-Ft Concealment Pole / Southington Industrial**
 Project: **37517-1973 / BU# 821898**
 Client: Crown Castle Drawn by: jjohnson App'd:
 Code: TIA-222-G Date: 05/04/17 Scale: NTS
 Path: Dwg No. E-1

CCI Flagpole Tool



Site Data	
BU#:	821898
Site Name:	Southington Industrial
App #:	

Code	
Code:	TIA-222-G
Ice Thickness:	1 in
Windspeed (V):	97 mph
Ice Wind Speed (V):	50 mph
Exposure Category:	C
Topographic Feature:	N/A
Structure Class:	II



FLANGE PLATE
(TYPE 3: SOLIDITY RATIO 0.5)

Tower Information	
Total Tower Height:	82 ft
Base Tower Height:	72 ft
Total Canister Length:	10 ft
Number of Canister Assembly Sections:	1

Canister Section Number *:	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)
1	10	36	Round	3	0.50	36	0.5	0.144	0.188

* Sections are numbered from the top of the tower down

** Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	No
----------------	----

Truck Ball on Tower:	No
----------------------	----

Geometry : Base Tower + Spine				37517-1972.001.7805.eri (last saved 05/04 8:48 am)				
Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
82	10		0	5.563	5.563	0.258	n/a	A53-B-35
72	32		0	26	26	0.25	n/a	A53-B-35
40	40		0	26	26	0.312	n/a	A53-B-35

Delete [x]
Delete [x]
Delete [x]

Discrete Loads : C _F A _F for Canister Assembly								
Canister Loading	Apply C _F A _F at Elevation(z) (ft)	C _F A _F No Ice (ft ²)	C _F A _F 1/2" Ice (ft ²)	C _F A _F 1" Ice (ft ²)	C _F A _F 2" Ice (ft ²)	C _F A _F 4" Ice (ft ²)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	82	9.000	18.500	19.000	20.000	22.000	0.094	0.206

Canister Load 2	72	9.000	18.500	19.000	20.000	22.000	0.239	0.350
-----------------	----	-------	--------	--------	--------	--------	-------	-------

Job Number:	37517-1891.001.7805
Engineer:	MEH
Site Name:	HART PARK
Site Number:	824445

Page:	1 of 1
Date:	5/22/2017
Version:	1.2
Effective:	6/3/2015

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CODE:	TIA-222-G
ASIF:	1.00

72 FT CONCEALMENT FLANGE CONNECTION CALCULATIONS

BOLT INFORMATION

Qty:	6.00	ea.
Diameter:	1.00	in.
Specification:	A325	
Bolt Fy	90	ksi
Bolt Fu	120	ksi
Bolt Circle:	20.0	in.

FLANGE REACTIONS

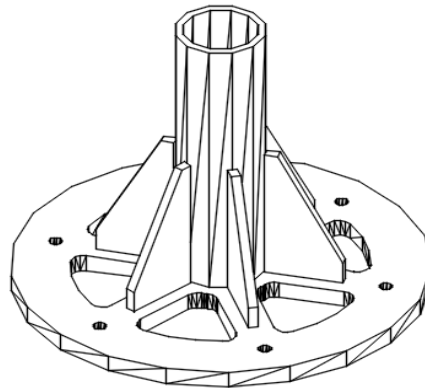
Moment (Mu):	4.48	kip*ft
Axial (Pu):	0.74	kips
Shear (Vu):	0.45	kips
Elevation:	72.00	ft
Max Ratio:	100%	

CONCEALMENT FLANGE INFORMATION

Spoke Thickness (t):	0.50	in.
Spoke Width (w):	3.00	in.
Steel Grade (Fy):	36	ksi

CONCEALMENT SPINE INFORMATION

Diameter:	5.56	in.
Thickness:	0.26	in.
Yield Stress (Fy):	35	ksi
Ult. Stress (Fu):	58	ksi
Weld Strength	70	ksi
Weld Type	CJP	
Top Weld Size		in.
Btm Weld Size		in.



STIFFENER INFORMATION

Configuration:	1	1 Stiffeners per Spoke
Weld Size:	0.375	in.
Width:	5.00	in.
Height:	5.00	in.
Thickness:	0.50	in.
Notch:	0.50	in.
Steel Grade:	36	ksi
Weld Strength:	70	ksi

FLANGE CONNECTION RESULTS

Flange Bolts: 3.1% **Passing**

Circumferencial Weld: **Acceptable**

Stiffeners - Combined: 61.2% **Passing**

Stiffeners - Weld to Spoke Plate: 3.7% **Passing**

Stiffeners - Vertical Weld to Spine: 3.5% **Passing**

Spine Wall Tear Out: 9.8% **Passing**

Concealment Flange Plate: 61.2% **Passing**

Base Pole Flange Plate: 3.2% **Passing**

Base Pole Flange Weld: 3.4% **Passing**

BASE POLE INFORMATION

Pole Diameter:	26.00	in.
Pole Thickness:	0.250	in.

BASE POLE FLANGE INFORMATION

Connected to:	Monopole	
Weld Type:	Groove	
Weld Size:	0.25	in.
Weld Strength:	70	ksi
Weld Length*:	13.35	in.
Spoke Thickness (t):	2.5	in.
Spoke Width (w):	3	in.
Steel Grade (Fy):	36	ksi

	in. (Override)
2.50	in. (Override)
	in. (Override)
	ksi (Override)

*Assumes a tributary length of the pole diameter based on the number of bolts.

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#:	
Site Name:	
App #:	
Manufacturer:	Other

Reactions

Moment:	63.78	ft-kips
Axial:	3.78	kips
Shear:	2.79	kips
Exterior Flange Run, T+q:		kips

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi^* V_n$ (kips):
38.88

Elevation: 40 feet

Bolt Data

Qty:	8		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	23	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu: 16.2 Kips, Ext. Tu=Interior Tu
 Adjusted $\phi^* T_n$ (due to $V_u = V_u / Q_t$), I: 54.5 Kips
 Bolt Stress Ratio: 29.6% **Pass**

Plate Data

Plate Outer Diam:	25.375	in
Plate Inner Diam:	18.375	in (Hole @ Ctr)
Thick:	1	in
Grade:	50	ksi
Effective Width:	5.75	in

Interior Flange Plate Results

Controlling Bolt Axial Force: 17.1 Kips, Ext. Cu=Interior Cu
 Plate Stress: 14.1 ksi
 Allowable Plate Stress, $\phi^* F_y$: 45.0 ksi
 Plate Stress Ratio: 31.4% **Pass**

Flexural Check

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

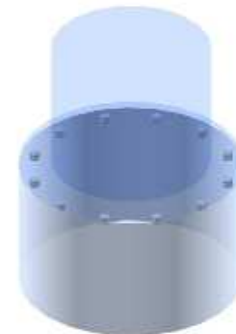
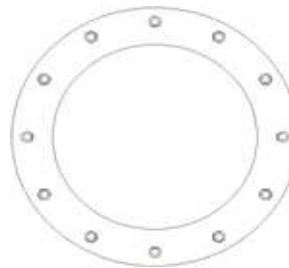
Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data

Pole OuterDiam:	26	in
Thick:	0.3125	in
Pole Inner Diam:	25.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data	
BU#:	
Site Name:	
App #:	
Pole Manufacturer:	<i>Other</i>

Reactions		
Mu:	215	ft-kips
Axial, Pu:	8	kips
Shear, Vu:	5	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	8	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	120	ksi
Yield (Fy):	90	ksi
Bolt Circle:	30.5	in

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results
 Max Rod (Cu+ Vu/η): 44.5 Kips
 Allowable Axial, Φ*Fu*Anet: 135.4 Kips
 Anchor Rod Stress Ratio: 32.9% **Pass**

Rigid
AISC LRFD
φ*Tn

Plate Data		
Diam:	35	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	10.21	in

Base Plate Results
 Base Plate Stress: 11.5 ksi
 Allowable Plate Stress: 45.0 ksi
 Base Plate Stress Ratio: 25.7% **Pass**

Flexural Check
 11.5 ksi
 45.0 ksi
 25.7% **Pass**

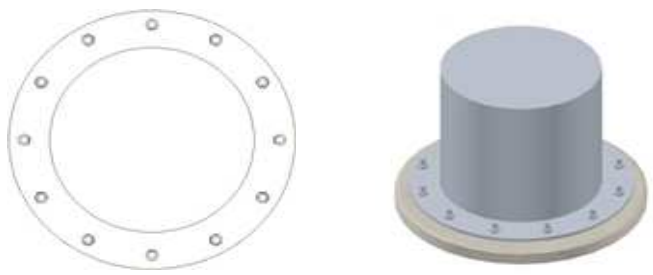
Rigid
AISC LRFD
φ*Fy
Y.L. Length: 15.00

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a
Stiffener Results
 Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2 n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results
 Pole Punching Shear Check: n/a

Pole Data		
Diam:	26	in
Thick:	0.3125	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt
 ** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

foundation loads

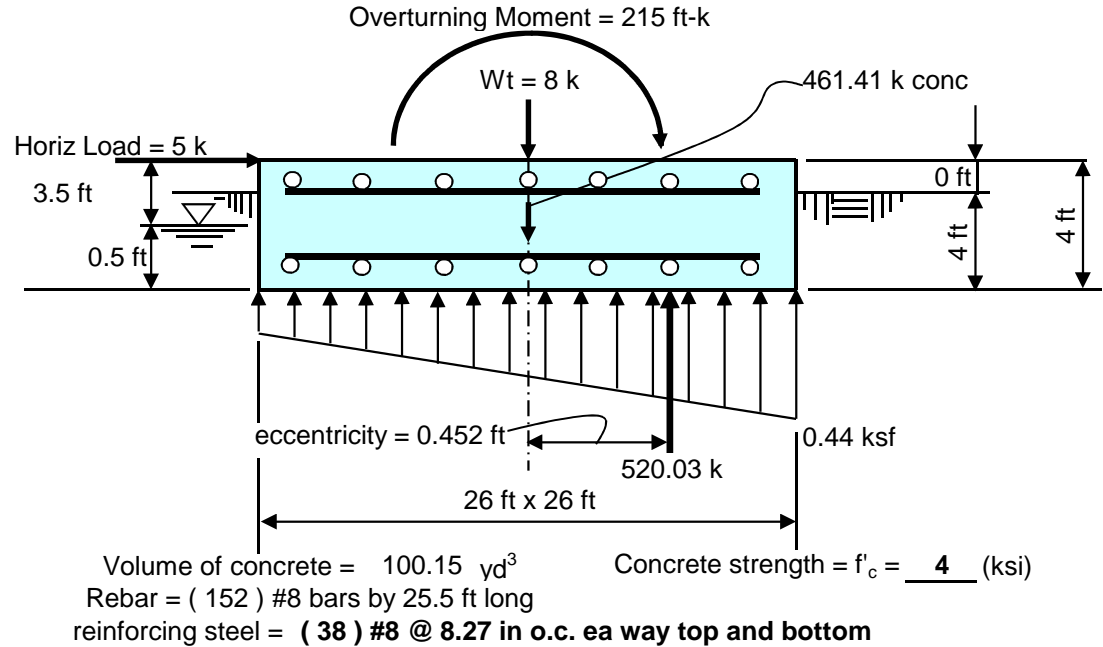
Limit states Tower or Pole Weight = 8 kips
 limit states total horizontal force = 5 kips
 limit states overturning moment = 215 ft-kips

soil properties

Safety factor against overturning = 1
 Soil Density = 100 pcf
 Ultimate soil bearing = 6 ksf
 Depth to water table = 3.5 ft

mat dimensions

depth to bottom of footing = 4 ft
 Footing thickness = 4 ft
 Footing Width = 26 ft
 Footing Length = 26 ft
 Tower/Pole Center Offset = 0 ft



Summary of analysis results

Overturning Moment:

(Stress Ratio = 0.046)

Calculated Ultimate Overturning Moment = 235 ft-kips

Resisting Moment = 5070.3 ft-kips

Factor of Safety against overturning = 21.576 > 1 **okay**

Rebar strength = F_v = 60 (ksi)
 minimum cover over rebar = 3 inches

Soil Bearing

(Stress Ratio = 0.098) < **CONTROLLING CRITERIA**

Limit States Maximum Net Soil Bearing = 4.5 ksf

Calculated limit states Soil Bearing Pressure = 0.44 ksf < 4.5 ksf **okay**

Bending Moment

(Stress Ratio = 0.02)

Ultimate Bending Moment Resistance = 5762 ft-kips

Calculated Ultimate Bending Moment = 118 ft-kips < 5762 ft-kips **okay**

Bending Shear

(Stress Ratio = 0.009)

Ultimate Bending Shear Resistance = 1459 kips

Calculated Ultimate Bending Shear = 14 kips < 1459 kips **okay**



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703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com



SmartLink, LLC on behalf of AT&T Mobility, LLC

Site FA – 10092205

Site ID – CT5251 (Rev4)

USID – 16335

Site Name – Southington

Industrial Center

Site Compliance Report

**500 Queen Street
Southington, CT 06489**

Latitude: N41-37-49.05
Longitude: W72-52-28.92
Structure Type: Self-Support

Report generated date: June 14, 2017
Report by: Kevin Bernstetter II, EI
Customer Contact: Kristen Smith

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

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Unknown
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at ground level
FCC & AT&T Compliant?	Will Be Compliant

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTL05251_2016-LTE-Next-Carrier_LTE-3C_mm093q_PTN...

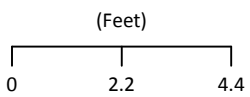
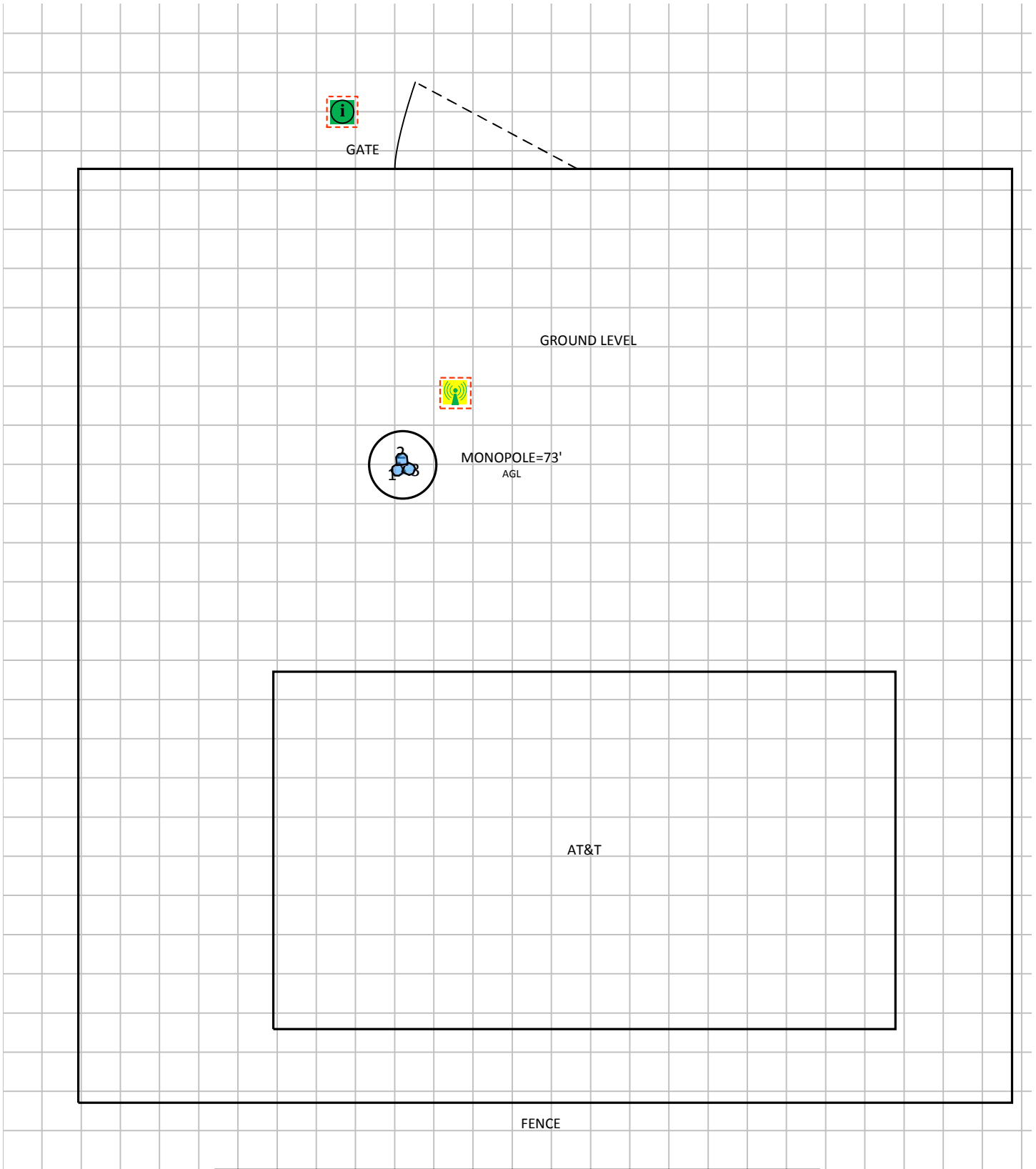
CD's: 10092205_AE201_170609_CTL05251_3C Rev4 - MDs RL's to KES 6-12-17

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

Site Scale Map For: Southington Industrial Center



www.sitesafe.com
 Site Name: Southington Industrial Center
 6/14/2017 8:16:49 AM

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

Sign Legend					
	Caution 1		Caution 2		Notice 2
	Notice 1		Warning		Info 1
	Info 2				

Barrier	Proposed Barriers/ Signs

3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z AGL
1	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	40	60.3	6.5	13.7	0	0	1	2182.7	18.5'	35.4'	74.2'
1	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	40	60.3	6.5	13.7	0	1	0	708	18.5'	35.4'	74.2'
1	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	737	40	66.1	6.5	13	0	0	1	1119.4	18.5'	35.4'	74.2'
1	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	850	40	62.4	6.5	13.2	0	1	0	564.9	18.5'	35.4'	74.2'
1	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	2300	40	58	6.5	13.93	0	0	1	1285.3	18.5'	35.4'	74.2'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	160	60.3	6.5	13.7	0	0	1	2182.7	18.7'	35.1'	74.2'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	160	60.3	6.5	13.7	0	1	0	708	18.7'	35.1'	74.2'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	737	160	66.1	6.5	13	0	0	1	1119.4	18.7'	35.1'	74.2'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	850	160	62.4	6.5	13.2	0	1	0	564.9	18.7'	35.1'	74.2'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	2300	160	58	6.5	13.93	0	0	1	1285.3	18.7'	35.1'	74.2'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	737	280	66.1	6.5	13	0	0	1	1119.4	18.3'	35.1'	74.2'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	850	280	62.4	6.5	13.2	0	1	0	578.1	18.3'	35.1'	74.2'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	2300	280	58	6.5	13.93	0	0	1	1285.3	18.3'	35.1'	74.2'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	280	60.3	6.5	13.7	0	0	1	2182.7	18.3'	35.1'	74.2'
3	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800 10891	Panel	1900	280	60.3	6.5	13.7	0	1	0	831.8	18.3'	35.1'	74.2'

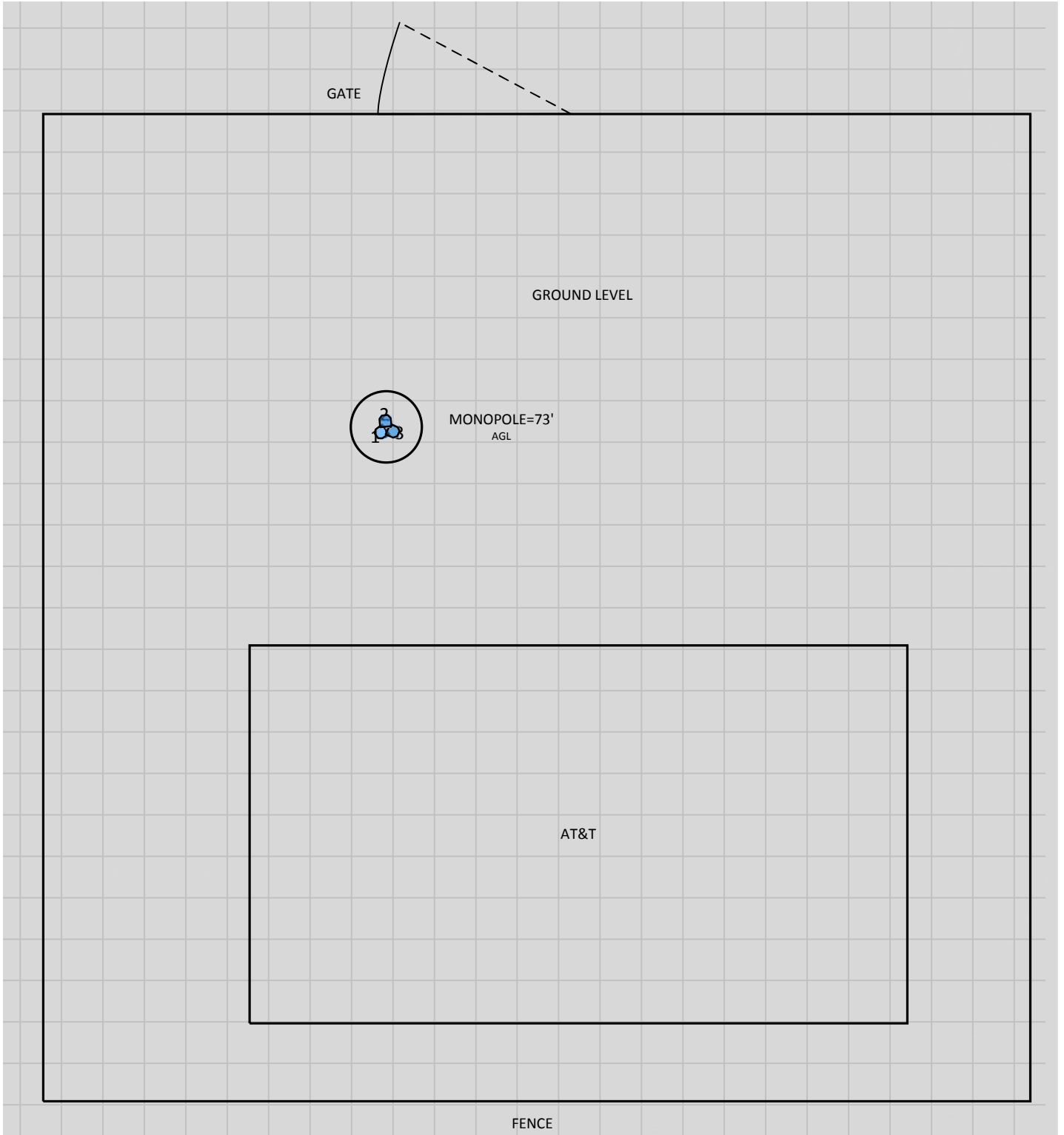
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the ground level unless otherwise indicated. The distance to the bottom of 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.

4 Emission Predictions

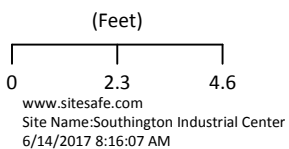
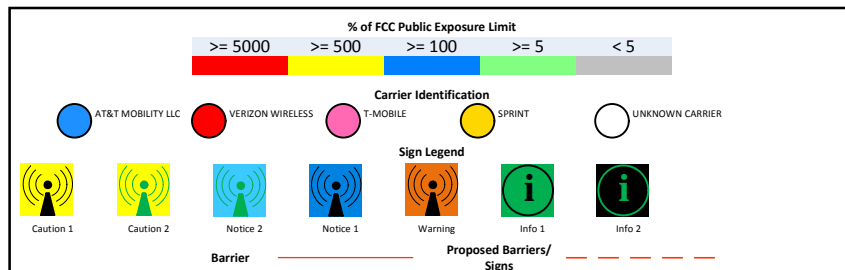
In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main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

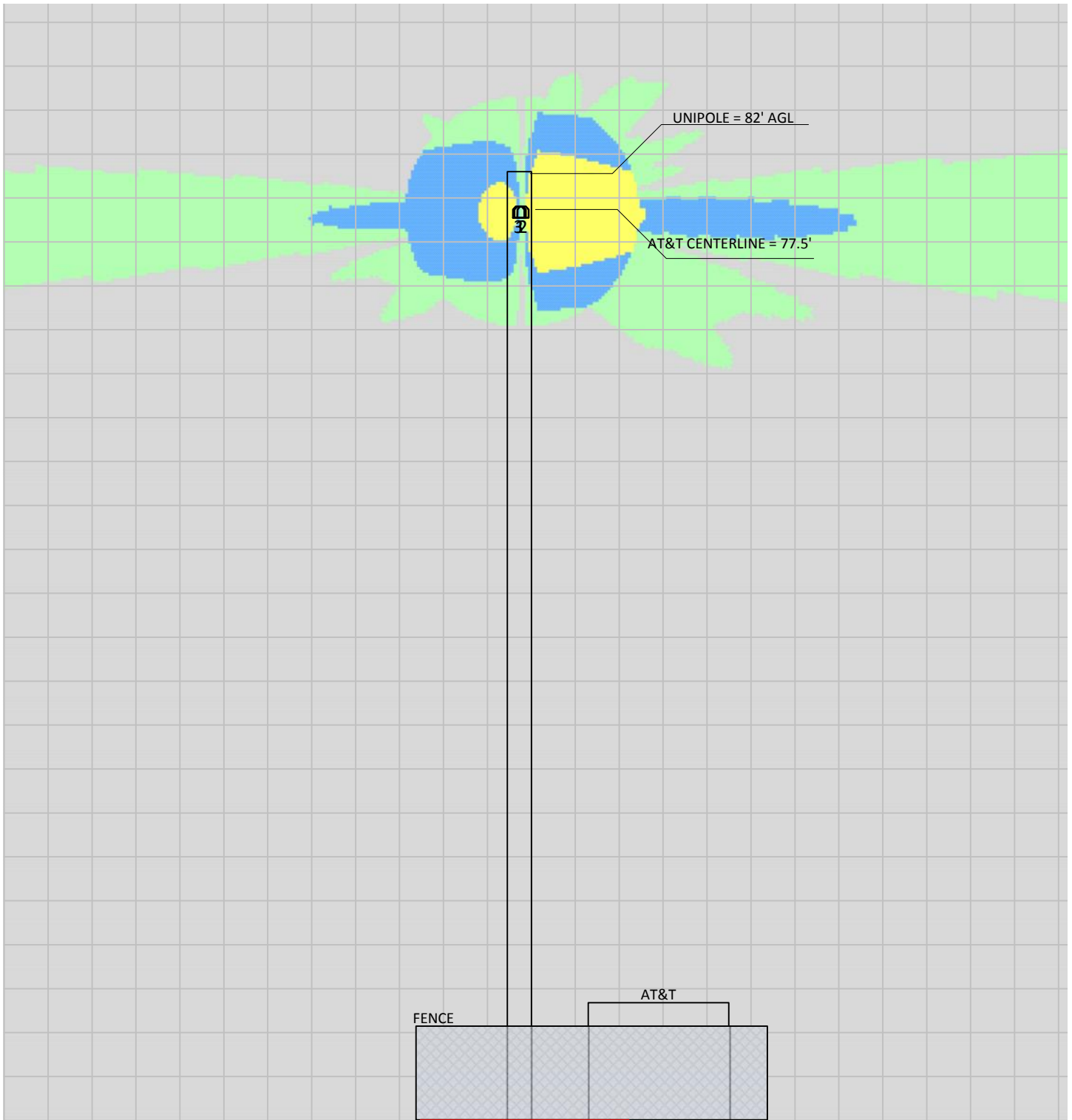
RF Exposure Simulation For: Southington Industrial Center



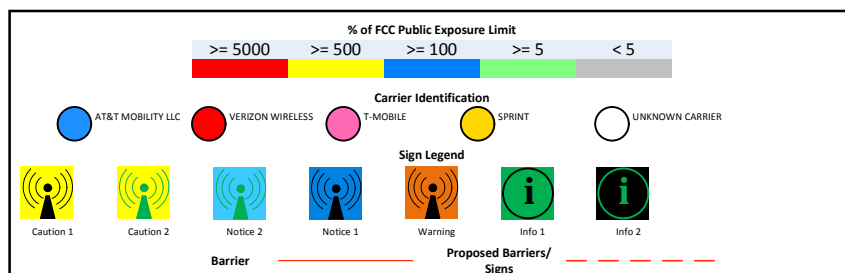
% of FCC Public Exposure Limit
Spatial average 0' - 6'



RF Exposure Simulation For: Southington Industrial Center Elevation View



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



(Feet)

0 6.4 12.9

www.sitesafe.com
Site Name: Southington Industrial Center
6/14/2017 8:21:31 AM

SitesafeTC Version: 1.0.0.0 - 0.0.0.262
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:

Site Access Location

Yellow caution 2 sign required.

Gate Location

Information 1 sign required.

Notes:

- Signage may already exist on site. Sitesafe is recommending as a worst case scenario.

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 Kevin Bernstetter II, EI.

June 14, 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.

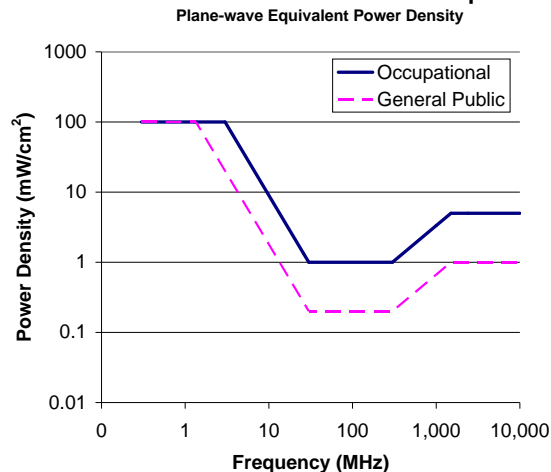
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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:

FCC Limits for Maximum Permissible Exposure (MPE)



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm 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_scenihp/docs/scenihp_o_022.pdf

Fairfax County, Virginia Public School Survey

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

UK Health Protection Agency Advisory Group on Non-ionising Radiation

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368

Norwegian Institute of Public Health

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