Erwin Road_NC-08828
Index of Documents Submitted for Approval of a Class B Special Use Permit Application

Tab #	Document	Ordinance Section
1	Orange County Class B Special Use Application	Section 2.2
2	Copy of checks submitted for the required fees	Section 2.2.4 (D)
3	Project Narrative (including the name and address of the owner of the property where the tower is to be located)	Section 2.7.3 (B) (1) Section 2.7.3 (B) (2) Section 5.10.8 (A) (1) (b)
4	Site Plan Prepared by a registered NC engineer (See Separate Folder)	Section 2.7.3 (B) (4)
5	A List of all parcels located within 1,000 feet and the name and address of each property owner as listed in the Orange County tax records and the Durham County tax records	Section 2.7.3 (B) (6), 5.8.10 (B) (3) (g)
6	Signed Statement/Certification of Compliance	Section 5.10.8(A)(1)(d) 5.8.10 (B) (3) (l)
7	A statement prepared by a professional engineer – certifying tower's compliance with the standards as set forth in NC Building Code – tower's capacity including an example of the number and type of antennas it can accommodate (Attached, sealed Tower Design behind Tab 9)	Section 5.10.8 (A) (1) (e), 5.8.10 (B) (3) (p)
8	Geotechnical Report	Section 5.10.8 (A) (1) (g)
9	Tower Design	Section 5.10.8 (A) (1) (g)
10	The search ring utilized in finding the proposed site.	Section 5.10.8 (A) (1) (j)
11	The number, type, height, and model of the proposed antennas along with a copy of the applicable specification sheet(s).	Section 5.10.8 (A) (1) (k)
12	The make, model and manufacturer of the tower and antenna(s), antenna heights and power levels of proposed site. This will include documentation establishing the azimuth, size, and centerline height location of all proposed and existing antennas on the structure. (See Tab 11).	Section 5.10.8 (A) (1) (l)
13	The frequency, modulation and class of service of radio or other transmitting	Section 5.10.8 (A) (1) (m)

	equipment. (See Tab 11).	
14	The maximum transmission power capability of all radios, as designed, if the applicant is a cellular or functional equivalent carrier, or the maximum transmission power capability, as designed, of all transmission facilities if the applicant is not a cellular or functional equivalent carrier. (See Tabs 11-13 and 15).	Section 5.10.8 (A) (1) (n)
15	The actual intended transmission and the maximum effective radiated power of the antenna(s).	Section 5.10.8 (A) (1) (o)
16	The direction(s) of maximum lobes and associated radiation of the antenna(s). See Tabs 11-15	Section 5.10.8 (A) (1) (p)
17	Certification that the NIER levels at the proposed site are within the threshold levels adopted by the FCC.	Section 5.10.8 (A) (1) (q), 5.10.8 (B) (4) (u)
18	Certification that the proposed antenna(s) will not cause interference with other telecommunications devices.	Section 5.10.8 (A) (1) (r)
19	A written statement stating why "the proposed site is necessary for their communications service" (e.g., for coverage, capacity, hole-filling, etc.) and a statement that there are no existing alternative sites within the provided search ring and there are no alternative technologies available which could provide the proposed telecommunications service need without the tower.	Section 5.10.8 (A) (1) (s)
20	A copy of the FCC license applicable for the intended use of the facility as well as a copy of the 5 and 10 year building out plan required by the FCC.	Section 5.10.8 (A) (1) (t)
21	Alternatives, placement to minimize adverse aesthetic and visual impacts on the land, property, buildings, and other facilities adjacent to, surrounding, and in generally the same area as the requested location of such wireless telecommunications support structure, which shall mean using the least visually and physically intrusive facility that is not technologically or commercially impracticable under the facts and circumstances	5.8.10 (B) (1) (a) and (b) Overall Policy and Desired Goals
22	Balloon Test Report	5.8.10 (B) (2) Balloon Test

23	Overall Site Plan: C-1 of CDs Rev4	5.8.10 (B) (3) (a)
24	Plan, elevations for all proposed structures: C-1A of CDs Rev4	5.8.10 (B) (3) (b)
25	A Landscape and Tree Preservation Plan: C-3 of CDs Rev4	5.8.10 (B) (3) (c)
26	Evidence that the applicant has investigated the possibilities of placing the proposed equipment on an existing wireless support structure: Listing of towers within a 2 mile radius and a listing of all wireless support structure, utility poles and other structures in the vicinity of the proposed facility that are technically feasible for utilization by the applicant to fill all or a substantial portion of the telecommunications service need identified by the Applicant pursuant to section 5.10.8(A)(1)(s). Documents shall be submitted at the time of application filing that indicates the applicant's ability or inability to co-locate on the identified tower(s) <u>and reasons why</u>.	5.8.10 (B) (3) (d)
27	Documentation from applicable state or federal agencies indicating requirements, which affect the appearance of the proposed wireless support structure, such as lighting and coloring.	5.8.10 (B) (3) (e)
28	Draft bond which will guarantee the removal of the wireless support structure in the event that it is abandoned or unused for a period of 12 months.	5.8.10 (B) (3) (f) 5.10.8 (B) (5)
29	A report containing any comments received by the applicant in response to the balloon test along with color photographs from various locations around the balloon.	5.8.10 (B) (3) (h)
30	Evidence that the balloon test requirement has been met, <u>including a notarized statement and listing of the property owners notified of the test</u>, a copy of a current Orange County Tax Map showing the subject property and all properties within the notification ring, and copies of the certified mail returned receipts from the mail-out. Notices were mailed by the County.	5.8.10 (B) (3) (i)
31	Evidence that the sign posting	5.8.10 (B) (3) (j)

	requirement has been met.	
32	Balloon Test photographs. (See Tab 22).	5.8.10 (B) (3) (k)
33	Location of tower and hierarchy of sites	5.10.8 (B) (4) (b) **From Attach 4** There are no 'County' owned facilities in the area allowing for antenna to be located. There are no existing towers in the area to address service provision needs. There are no 'County' owned properties where a tower could be located. There are no commercially and/or industrially zoned properties in the area where a tower could be located. There are no properties zoned AR in the general vicinity of this property where a tower can be placed to address service issues. This property is zoned for residential use. This property represents the lowest priority site per Section 5.10.8 (B) (4) (b) (i) (f) as detailed above. The proposed tower is located: '*On properties in areas zoned for residential use* The applicant is not by-passing a 'higher priority' site with the proposal to erect a tower on this property. There are no higher priority sites in the area where a tower can be located. There are no wireless support structures within ½ mile of this property
34	The applicant shall demonstrate and	5.10.8 (B) (4) (g)

	provide a description in writing and by drawing how it shall effectively screen from view the base and all related equipment and structures of the proposed facility. (See Construction Drawings).	
35	Collocation – T-Mobile Application	5.10.8 (B) (4) (l)
36	To minimize the number of antenna arrays and thus the visual impact, the County may require the use of dual mode antennas to be used, including by two different carriers, unless it can be proven that such will not work technologically and that such would have the effect of prohibiting the provision of service in the County. **Not applicable.**	5.10.8 (B) (4) (m)
37	Structures shall be galvanized and/or painted with a rust-preventive paint of an appropriate color to harmonize with the surroundings. (See Construction Drawings).	5.10.8 (B) (4) (n)
38	All new or replacement antennas, except omni-directional whip antennas, shall be flush-mounted. (See Construction Drawings).	5.10.8 (B) (4) (p)
39	Facilities, including antennas, towers and other supporting structures, such as guy anchor points and wires, shall be made inaccessible to individuals and constructed or shielded in such a manner that they cannot be climbed or collided with; and transmitters and telecommunications control points shall be installed in such a manner that they are readily accessible only to persons authorized to operate or service them. **Acknowledged**	5.10.8 (B) (4) (s)
40	All abandoned communication wireless support structures shall be removed within 12 months of the cessation of use. A bond or other security guaranteeing the removal of the tower in the event that it is abandoned or unused for a period of 12 months shall be posted. A cost estimate shall be provided by a qualified General Contractor licensed in the State of North Carolina. The amount of the security shall be 110% of the estimate.	5.10.8 (B) (4) (t)

	Acknowledged	
41	Electro-magnetic radiation levels. **Acknowledged**	5.10.8 (B) (4) (v)
42	Signs (**See Sheet C-5** in Construction Drawings)	5.10.8 (B) (4) (w)
43	Liability Insurance	5.10.8 (B) (6)

Orange County Planning and Inspections Department

APPLICATION FOR CLASS B SPECIAL USE PERMIT

APPLICANT INFORMATION:

Date: _____

Applicant: Skyway Towers, LLC and T-Mobile
Phone: 813-960-6217

Address: 20525 Amberfield Drive, Suite 102
Land O' Lakes, FL 34639
Cell Phone: 813-270-1197
E-mail: JJones@skywaytowers.com

Agent: Thomas H. Johnson, agent
Phone: 919-786-2764

Address: 4141 Parklake Ave., Suite 200
Raleigh, NC 27612
Cell Phone: 919-616-3100
E-mail: TJohnson@nexsenpruet.com

Address of subject property: 5022 Kerley Road, Durham, NC 27705

Parcel Identification Number (PIN): 0801154533
Lot Size: 5.80 acres

Zoning Designation: RB
Watershed Overlay: _____

Other Overlay Zoning Districts: _____

Request (include detailed description of proposed land use): Skyway Towers, LLC proposes to erect a 125' telecommunication tower (with a 4' lightning rod) on a 5.80 acre of land located at 5022 Kerley Road. The parcel is further identified as PIN 0801154533. The tower will be placed within a 100 foot by 100 foot leased area on the south-west portion of the parcel. The tower and the equipment cabinet(s), to house equipment for communication providers, will be enclosed within a 60 foot by 60 foot fenced compound. Access to the facility will be provided by a proposed 20' wide drive entering from Mt. Sinai Road (SR 1718).

SUBMITTAL INFORMATION Per Section 2.7.3 of the Unified Development Ordinance (UDO), all Class A Special Use Permit applications are required to submit the following:

1) 10 copies of a site plan prepared by a registered North Carolina land surveyor, landscape architect, architect, or engineer containing all required information detailed within Section 2.5 of the UDO. This site plan will also need to contain all relevant information demonstrating that the proposed special use compliance with all general and specific standards governing the proposed special use as detailed within Article(s) 5 and 6 of the UDO.
2) A detailed narrative outlining the proposed land use including operational requirements, the location of facility, appearance, etc.,
3) Documentation establishing compliance with Section 5.3.2 inclusive of the UDO.
4) The names and addresses of the owners involved with the project,
5) A list of property owners within 500 feet of the subject parcel and the name and address of each property owner, as currently listed in the Orange County tax records,
6) Elevations of all structures proposed to be used in the development,
7) 10 copies of the Environmental Assessment and/or Environmental Impact Statement if required by Section 6.16 of the UDO,
8) Statement outlining the anticipated development schedule for the completion of the project,

**** NOTE: It should be remembered that the review of all special use permit applications/modifications are carried out in a *quasi-judicial* format meaning that decisions relating to the approval or denial of an application are based solely on the sworn testimony of all parties involved with the case, both those for and against an application, as well as the review of competent material and substantial evidence submitted during the public hearing.**

Further the applicant has the burden of establishing, by the submission of competent material and substantial evidence, the existence of facts and conditions that demonstrate the projects compliance with the various requirements and standards detailed within the Unified Development Ordinance. **

I (we), the undersigned, have been made aware of the process for the review and action associated with a Class B Special Use Permit application and understand that only completed applications, containing all information required by the Orange County UDO shall be reviewed and acted upon by the County.

I (we) understand that it shall be my (our) responsibility to present evidence to the County in the form of sworn testimony, exhibits, documents, models, plans, and the like support the request for approval of the Class B Special Use Permit.

Further I (we) understand that any assistance I (we) may receive from County staff in preparing this application in no way guarantees a favorable recommendation by staff on the merits of this proposal nor does it guarantee an approval of the request by the County.

Applicant _____ Date: 4/23/15

Applicant _____ Date: _____

SECTION 2.7: SPECIAL USE PERMITS

2.7.1 Generally

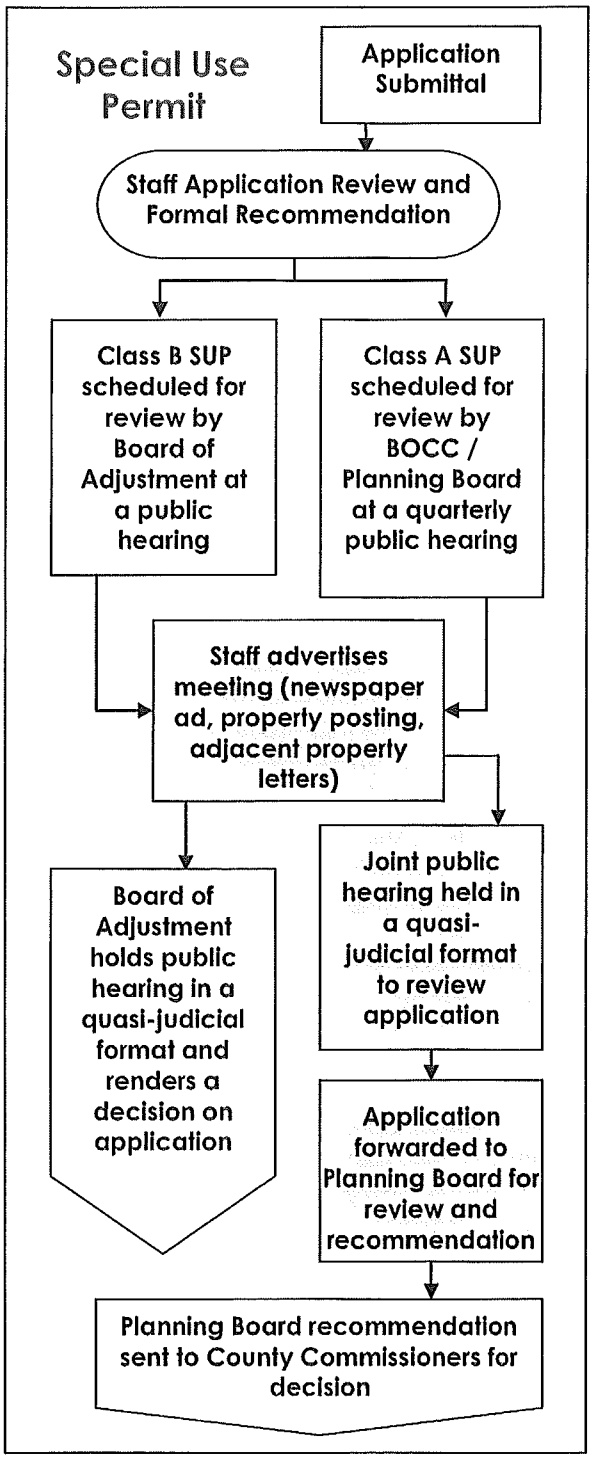
(A) Any use or development designated by applicable zoning district regulations contained within Article 5 as a special use, or as allowed only pursuant to a special use permit (either Class A or Class B), may be established in that district only after the use or development is authorized by a validly issued and recorded special use permit.

(B) This section sets forth required review and approval procedures for submittal, review, and approval of applications for special use permit.

(C) A special use permit authorizes its holder to use or develop a particular parcel of land in a particular way, as specified by the terms and conditions of the special use permit.

(D) A special use permit imposes on its holder the responsibility of ensuring that the authorized use or development continues to comply with the terms and conditions of approval.

(E) Issuance of a special use permit does not relieve the holder of the special use permit of the additional responsibility of obtaining a building permit or any other permit or approval required by any other applicable law.



2.7.2 Review and Approval Flow Chart

The review and approval process for Special Use Permits is shown in the procedure's flowchart.

2.7.3 Application Requirements

(A) Applications for a Special Use shall be submitted on forms provided by the Planning Department in accordance with Section 2.2 of this Ordinance.

(B) Applications shall include:

(1) A full and accurate description of the proposed use, including its location, appearance, and operational characteristics.

(2) The name(s) and address(es) of the owner(s) of the property involved.

(3) Relevant information needed to show compliance with the general and specific standards governing the Special Use (See Articles 5 and 6).

(4) For Class A Special Uses 26 copies of the site plan, and for Class B Special Uses 10 copies of the site plan, prepared by a registered North Carolina land surveyor, landscape architect, architect, or engineer, which shall contain the information listed in Section 2.5.

(5) If the application involves a Preliminary Subdivision Plat, 26 copies of the Plat prepared in accordance with Section 7.14 shall be provided.

(6) A list of all parcels located within 500 feet of the subject parcel and the name and address of each property owner, as currently listed in the Orange County tax records.

(7) Elevations of all structures proposed to be used in the development.

(8) For Class A Special Uses 26 copies and for Class B Special Uses 10 copies of the Environmental Assessment and/or Environmental Impact Statement, if required by Section 6.16.

(9) Method of disposal of trees, limbs, stumps and construction debris associated with the permitted activity, which shall be by some method other than open burning.

(10) Statement from the applicant indicating the anticipated development schedule for the build-out of the project.

(11) Statement from the applicant in justification of any request for vesting for a period of more than two years (five years maximum).

2.7.4 Staff Review

(A) The Planning Director shall cause an analysis to be made of the application by qualified representatives of the County and other agencies or officials as appropriate.

(B) The Planning Director shall submit the analysis to the Board of County Commissioners and the Planning Board, in the case of Class A Special Uses, or the Board of Adjustment, in the case of Class B Special Uses.

(C) The appropriate Board reviewing the application shall receive and enter the analysis into evidence during the public hearing. The analysis shall be subject to examination by all interested parties and the Planning Director shall be subject to cross-examination regarding the analysis.

(D) The Planning Director shall not make a recommendation on the general findings detailed within Section 5.3 of this Ordinance

2.7.5 Notice Requirements for Class A Special Use Permits

(A) The Planning Director shall give public notice of the date, time and place of the public hearing to be held to receive comments, testimony and exhibits pertaining to the application for a Special Use.

(B) Such notice shall be published in a newspaper of general circulation in Orange County once a week for two successive weeks, with the first notice to be published not less than ten days nor more than 25 days prior to the date of the hearing. In computing the notice period, the day of publication is not to be included, but the day of the hearing is to be included.

(C) The Planning Director shall post on the affected property a notice of the public hearing at least ten days prior to the date of said hearing.

(D) Written notice shall be sent by certified mail to all adjacent property owners not less than 15 days before the hearing date. Adjacent property owners are those whose property lies within five hundred feet of the affected property and whose names and addresses are currently listed in the Orange County tax records.

2.7.6 Notice Requirements for Class B Special Use Permits

Notice Requirements for Class B Special Use Permits shall follow the procedures in Section 2.12.6.

2.7.7 Nature of Proceedings

(A) The review of Special Use Permit applications shall be conducted during a public hearing by the decision-making board.

(B) The review of a Special Use Permit application is a quasi-judicial process, where the Board responsible for rendering a decision acts much like a panel of judges. The Board hears factual evidence and sworn testimony presented at an evidentiary hearing, and then makes findings of fact supported by competent, substantial, and material evidence.

(C) The chair or presiding officer of the hearing shall swear all parties intending to present evidence or testimony during the hearing.

(D) The chair or presiding officer may take whatever action is necessary to limit testimony to the presentation of new factual evidence that is material to the application, to ensure fair and orderly proceedings, and to otherwise promote the efficient and effective gathering of evidence. Such actions may include:

(1) Barring the presentation of obvious hearsay evidence,

(2) Barring the presentation of non-expert opinion,

(3) Interrupting digressions into immaterial testimony,

(4) Interrupting repetitive testimony,

(5) Reasonably limiting the time allotted each witness or cross-examination,

(6) Providing for the selection of spokespersons to represent groups of persons with common interests,

(7) Interrupting personal attacks, and/or

(8) Ordering an end to disorderly conduct.

(E) Where the Board finds compliance with the general standards, specific rules governing the specific use, and that the use complies with all required regulations and standards, the application must be approved unless the Board shall also find, in some specific manner, that:

(1) the use will not maintain or promote the public health, safety and general welfare, if located where proposed and developed and operated according to the plan as submitted.

(F) Those opposing approval of the application on the grounds that the use will not promote the public health, safety and general welfare shall have the burden of establishing, by competent material and substantial evidence, the specific manner in which the proposed use does not satisfy the requirements for approval of the application for a Special Use.

2.7.8 Review and Decision

(A) For Class A Special Use permits, the following shall apply:

(1) The Board of County Commissioners and Planning Board shall review the application during a regularly scheduled public hearing.

(2) Following review at a public hearing, the Special Use permit application shall be referred to the Planning Board for its consideration and recommendation.

(3) The Board of County Commissioners may direct the Planning Board to provide a recommendation by a date certain. If the Board of County Commissioners does not so direct, the Planning Board shall make its recommendation within three regularly scheduled meetings.

(4) If the Planning Board fails to make a recommendation within the time allotted within subsection (3) above, the application shall be forwarded to the Board of County Commissioners without a Planning Board recommendation.

(5) After receipt of any Planning Board recommendation and closure of the public hearing, the Board of County Commissioners shall take action upon the application. This action shall be one of the following:

(a) Approval;

(b) Approval with conditions; or

(c) Denial.

(B) For Class B Special Use Permits, the following shall apply:

(1) The Board of Adjustment shall review the application during a regularly scheduled public hearing.

(2) The Board of Adjustment shall conduct the hearing in accordance within the provisions detailed in this Section as well as those contained within Section 2.12.

(3) After completion of the public hearing, the Board of Adjustment shall take action upon the application. This action shall be one of the following:

(a) Approval;

(b) Approval with conditions; or

(c) Denial.

2.7.9 Standards of Evaluation

The following specific standards shall be used in deciding on an application:

(A) The project meets all applicable design standards and other requirements of this Ordinance.

(B) The development can reasonably be completed within the vesting period requested, if any.

(C) Where vesting in excess of two years is requested, the project is located in an area where current issues under study do not involve potential amendments to the Comprehensive Plan and/or this Ordinance.

2.7.10 Required Findings

(A) A resolution or motion to approve the application must include the findings of fact and conclusions of law that support the decision. Any proposed conditions of approval must also be included in the resolution or motion to approve the application.

(B) A resolution or motion to deny the application must state findings of fact and conclusions of law that support the decision.

(C) If a resolution or motion to approve the application fails, the application is deemed denied. Those members voting against the resolution or motion must state which of the conclusions of law they could not reach as well as findings of fact on which their inability to reach the conclusions is based.

2.7.11 Conditions of Approval

(A) The Board of County Commissioners or the Board of Adjustment, as appropriate, may impose such reasonable conditions upon approval of a Special Use as will afford protection of the public health, safety and general welfare, ensure that substantial justice is done, and equitable treatment provided.

(B) Conditions shall run with the land and use, and shall be binding on the original applicant(s) as well as all successors, assigns and heirs.

(C) The Special Use Permit shall include a statement that if any condition of a Special Use Permit shall be held invalid or void, then the permit itself shall be void and of no effect.

(D) It shall be stated in the Special Use Permit that the Permit shall automatically expire within 12 months of the date of approval if the use has not commenced or construction has not commenced or proceeded unless a timely application for extension of this time limit is approved by the Board of County Commissioners as provided in Section 2.7.13.

2.7.12 Notification of Board Action

(A) The Planning Director shall send a notice of the relevant Board's action on the application by certified mail to the applicant. A copy of the decision shall be filed in the Planning Department within five business days of the relevant Board's action.

(B) The Planning Director, in the case of approval or approval with conditions, shall issue the necessary permit in accord with the Board's action.

(C) The Planning Director, but not a designee, shall certify that the Special Use Permit with any imposed conditions is as approved by the Board of County Commissioners or Board of Adjustment, as appropriate, with a report provided to the County Manager.

(D) Once the Special Use Permit has been certified, the applicant shall record the permit with the Orange County Register of Deeds in a format prepared by the Planning Director. Failure to do so within 90 days from certification shall invalidate the Special Use Permit.

2.7.13 Time Limits and Extensions

(A) If a request is received before the Special Use permit expires, the Board of County Commissioners, for good cause shown, may extend the expiration deadline six months upon the favorable recommendation of the Planning Board.

(B) The application for an extension request shall be submitted a minimum of six months prior to the expiration of the Special Use Permit.

(C) No changes shall be made to the terms and/or conditions of approval.

(D) Only one approval of a time extension is permitted, and it shall be based on evidence presented by the applicant showing that permits have been pursued in a timely manner, and that delays have resulted from factors beyond the control of the applicant.

(E) For developments which require approval of a Special Use Permit, the applicant may request that the Special Use Permit be vested as a Site Plan for a period of not less than two nor more than five years. For vesting purposes, Site Plans and Preliminary Plats may also be approved as a Special Use Permit at the request of the applicant. See Section 2.5 for information regarding site plans.

2.7.14 Changes to Approved Plans

(A) The Planning Director is authorized to approve minor changes in the approved plans of Special Uses, as long as they are in harmony with action of the approving Board, but shall not have the power to approve changes that constitute a modification of the approval. A modification shall require approval of the Board having jurisdiction.

(B) The following criteria shall constitute a modification:

(1) Any change in a condition imposed during the approval of a special use permit.

(2) Any change in use or enlargement of approved use.

(3) Any increase in intensity of use. An increase in intensity of use shall be considered to be an increase in usable floor area and/or an increase in the number of dwelling or lodging units.

(4) Structural alterations which significantly affects the basic size, form, style, ornamentation, and/or character of the building as shown on the approved site plan or described in the applicant's narrative.

(5) Substantial change in the amount and/or location of open space, recreation facilities or landscape screening.

(6) Any increase in the size or number of approved signs.

(7) Any change in parking areas resulting in an increase or reduction of 5% or more in the number of spaces approved.

(8) Substantial changes in pedestrian and/or vehicular access or circulation.

(9) Any change in a setback required by the provisions of this Ordinance or imposed as a condition of approval.

(10) Any change in the location or extent of street and utility improvements or rights-of-way, including water, sewer and storm drainage facilities, which would provide a different level of service.

(C) The Planning Director shall, before making a determination as to whether a proposed action is a minor change or a modification, review the record of the proceedings on the original application for approval of the Special Use. The determination shall be based upon the request of the applicant, the review of the record of the approval of the original request and the Planning Director's findings under the criteria of subsection (B) above.

(D) The Planning Director shall, if it is determined that the proposed action is a minor change, state the findings in writing to the applicant. The applicant shall file an amended site plan, or written statement, outlining in detail the minor change(s) proposed. The Planning Director shall file the amended site plan or written statement with the approved site plan.

(E) If it is determined that the proposed action is a modification, the Planning Director shall require the applicant to submit a request for modification of the approved special use permit. The following procedures shall be adhered to in the case of a modification:

(1) The applicant shall provide an amended site plan and written narrative outlining the specific changes requested.

(2) The Planning Director shall submit the request to the Board that approved the original application.

(3) The Board shall set a public hearing to receive testimony concerning the modification request. Any public hearing called pursuant to a modification of an approved special use permit shall be held in conformity with the relevant public notification requirements contained in this Article.

(4) The Board may approve, approve with conditions, or deny the application for a modification.

(5) The Planning Director shall file the Board's action in the Planning Department as an amendment request to the original application and shall notify the applicant of the Board's action.

SECTION 5.3: APPLICATION OF USE STANDARDS

5.3.1 In General

In addition to the general standards applied to uses in each zoning district and in accordance with the Table of Permitted Uses, Sections 5.4 through 5.14 establish additional standards for specific Permitted Uses, Special Uses, Conditional Uses, and uses permitted in Conditional Zoning Districts.

5.3.2 Special Uses

(A) General Standards

Before any application for a Special Use Permit shall be approved:

(1) The applicant shall have the burden of establishing, by competent material and substantial evidence, in the form of testimony, exhibits, documents, models, plans and other materials, that the application meets the requirements for approval of a Special Use; and

(2) The Board of County Commissioners or Board of Adjustment shall make written findings certifying compliance with the specific rules governing such individual Special Use and that the use, which is listed as a Special Use in the district in which it is proposed to be located, complies with all required regulations and standards including the following general conditions:

(a) The use will maintain or promote the public health, safety and general welfare, if located where proposed and developed and operated according to the plan as submitted;

(b) The use will maintain or enhance the value of contiguous property (unless the use is a public necessity, in which case the use need not maintain or enhance the value of contiguous property); and

(c) The location and character of the use, if developed according to the plan submitted, will be in harmony with the area in which it is to be located and the use is in compliance with the plan for the physical development of the County as embodied in these regulations or in the Comprehensive Plan, or portion thereof, adopted by the Board of County Commissioners.

(B) Specific Standards

In addition to the general standards stated in Section 5.3.2(A), the following specific standards shall be addressed by the applicant before the issuance of a Special Use Permit:

(1) Method and adequacy of provision of sewage disposal facilities, solid waste, and water.

(2) Method and adequacy of police, fire and rescue squad protection.

(3) Method and adequacy of vehicular access to the site and traffic conditions around the site.

(4) Other use specific standards as set forth herein.

(C) Specific Standards for Class A Special Use Permits Within Hillsborough EDD

In addition to the general and specific standards for all Special Use Permits, the following standards shall be addressed by the applicant before the issuance of a Class A Special Use Permit within the Hillsborough Economic Development District:

(1) General Provisions

(a) This section establishes criteria pertaining to appearance in the design of a site, buildings and structures, landscaping, signs, and other miscellaneous features that are observed by the public.

(b) Aesthetic criteria are not intended to restrict imagination, innovation, or variety, but rather to assist in focusing on design principles which result in creative solutions that will promote visual appearance within the city and county, preserve taxable values, and promote the public health, safety and welfare.

(2) General Design Standards

(a) Harmonious and efficient organization

(i) The site plan shall be organized harmoniously and efficiently in relation to existing topography, the size and type of plot, the character of adjoining property, and the type and size of buildings.

(ii) The site will be developed to facilitate orderly development of surrounding property and with minimal disturbance to the natural environment.

(b) Preservation of natural state

(i) Desirable vegetation or other unique natural features shall be preserved in their natural state when practical.

(ii) The Environmental Protection Plan shall include the locations of all existing trees 12" diameter four feet above the ground.

(c) Enhancement of residential privacy

The site plan shall provide reasonable visual, lighting, and sound privacy for all adjacent dwelling units.

(d) Emergency access

Structures and other site features shall be arranged to permit practical emergency vehicle access to all sides of buildings.

(e) Access to public ways

Every structure and dwelling unit shall have access to a public street, walkway or other area dedicated to common use.

(f) Non-motorized circulation

(i) A non-motorized circulation system shall be provided which is direct, efficient, and pleasant.

(ii) The system shall be complementary to, but independent of the vehicular circulation system.

(g) Design of access and egress drives

The location, size, and numbers of ingress and egress drives to a site will be strictly limited to minimize the negative impacts on public streets and on adjacent property. This shall include formal entryways and access to outparcels from inside the development only.

(h) Coordination with off-site circulation systems

(i) The arrangement of rights-of-way or easements for circulation shall coordinate with the pattern of existing and planned streets, pedestrian and/or bicycle pathways and transit routes in the area.

(ii) Connection to adjacent properties is encouraged where possible.

(i) Stormwater control

(i) Protective measures shall ensure that removal of stormwater runoff will not adversely affect neighboring properties or the public storm drainage system.

(ii) Provisions shall be made for construction of stormwater facilities including grading, gutters, and piping to direct stormwater and prevent erosion.

(iii) Surface water on all paved areas shall be collected at intervals that do not obstruct vehicular or pedestrian traffic.

(j) Exterior lighting

The location, type, size and direction of exterior lighting shall not cause glare or direct illumination that interferes with adjacent properties or safety of public rights-of-way.

(k) Protection of property values

Elements of a site plan shall be arranged to have minimum negative impact on values of adjoining property and other on-site uses.

(3) Specific Standards

(a) Unless otherwise indicated herein, the relevant standards for the specific Economic Development Zoning Districts shall apply.

(b) Where actions, designs, or solutions proposed by the applicant are not literally in accord with the applicable regulations of this Ordinance, but the Board of County Commissioners makes a finding in the particular case that public purposes are satisfied to an equivalent or greater degree, the Board of County Commissioners may make specific modification of the regulations in the particular case. Any modification of regulations shall be explicitly indicated in the approved permit.

(c) Relationship of buildings to site

(i) The site shall be planned to provide for adequate planting, safe pedestrian movement, and parking areas.

(ii) Parking areas shall be treated with decorative elements, building wall extensions, plantings, berms, or other innovative means so as to screen parking areas from view from public ways and reduce heat generated by paved areas.

(iii) Without restricting the permissible limits of the applicable zoning district, the height and scale of each building shall be compatible with its site and existing or anticipated adjoining buildings.

(iv) All utility services shall be underground.

(d) Relationship of buildings and site to adjoining areas

(i) Attractive landscape transition to adjoining properties shall be provided.

(ii) Lighting intensity at the property line adjacent to residential uses shall not be greater than ½ footcandle.

(e) Building design

(i) Architectural style is not restricted. Evaluation of the appearance of a project shall be based on its relationship to the surroundings. Primary and pedestrian facades are encouraged to complement and reflect the characteristics of downtown Hillsborough.

(ii) Specific building materials are not endorsed. Evaluation of the appearance of a project shall be based on the relationship to surroundings.

a. Materials and design shall be compatible with each other in multiple building projects.
b. Materials shall be selected for suitability to the type of buildings and the design in which they are used. Utilitarian materials shall be limited to inconspicuous facades and non-public or service areas.
c. Materials with unique or special character are encouraged.

(iii) Buildings and building components, such as walls, windows, doors, eaves, and parapets, shall have human proportions and relationships to one another.

(iv) Mechanical equipment or other utility hardware on the roof, ground, or buildings shall be screened from public view with materials harmonious with the building, or they shall be so located as not to be visible from any public ways. This provision does not apply to the installation of electric vehicle charging stations.

(v) Exterior lighting shall be part of the architectural concept. Fixtures, standards, and all exposed accessories shall be harmonious with building design.

(vi) Recycling and waste removal areas, service yards, storage yards, and exterior work areas shall be located away from and screened from view from public ways, using materials as stated in criteria for equipment screening. Areas shall be sized to accommodate changes in technology and local refuse ordinances.

(vii) Variation of detail, form, material, and siting may be used to provide visual interest. In multiple building projects, variable siting of individual buildings may be used to prevent a monotonous appearance.

(f) Landscaping and Site Treatment

Landscape elements included in these criteria consist of all forms of planting and vegetation, ground forms, rock groupings, water patterns, and all visible construction except buildings and utility structures. New and existing vegetation shall be maintained in a flourishing manner.

(i) Natural or existing topographic patterns contributing to the beauty and utility of a development shall be preserved and developed. Modification to topography will be permitted where it contributes to good appearance and does not adversely affect significant natural features and drainageways.

(ii) Grades of walks, parking spaces, terraces, and other paved areas shall provide an inviting and stable appearance.

(iii) Landscape treatment shall be provided to enhance architectural features, strengthen vistas and important visual corridors, and provide shade.

(iv) Unity of design shall be achieved by repetition of certain plan varieties and other materials and by correlation with adjacent developments.

(v) Plant material shall be selected for its structure, texture, and color for interest and for its ultimate growth. Use of native plants is encouraged; others that will be hardy, harmonious to the design, and of good appearance can be allowed.

(vi) Appropriate curbs, tree guards or other devices shall be employed to protect plants susceptible to injury by pedestrian or motor traffic.

(vii) Parking areas and trafficways shall be enhanced with landscaped spaces containing trees or tree groupings.

(viii) Service yards and other unsightly places shall be screened by use of walls, fencing and/or planting.

(g) Signs

(i) Every sign shall have appropriate scale and proportion in its design and in its visual relationship to buildings and surroundings. A unified signage plan shall be submitted and approved with the Special Use Permit.

(ii) Every sign shall be designed as an integral architectural element of the building and the site to which it principally relates.

(iii) The colors, materials and lighting of every sign shall be harmonious with the building and site to which it principally relates.

(iv) The number of graphic elements on a sign shall be held to the minimum needed to convey the sign's major message and shall be composed in proportion to the total area of the sign face.

(v) Freestanding signs shall not be pole-mounted.

(h) Maintenance, planning and design factors

(i) Materials and finishes shall be selected for their durability and wear as well as for their beauty. Proper measures and devices shall be incorporated for protection against the elements, neglect, damage, and abuse.

(ii) Provisions for cleaning buildings and structures and control of dirt and refuse shall be included in the design. Configurations that tend to accumulate debris and dirt shall be avoided.

SECTION 5.4: STANDARDS FOR TEMPORARY USES

5.4.1 Yard Sale

(A) General Standards for Evaluation

(1) Yard sales are permitted in accordance with the Table of Permitted Uses provided that these sales do not exceed two days per month.

5.4.2 Temporary Fund Raising Activity

(A) General Standards for Evaluation

(1) Temporary fund raising activities are permitted in accordance with the Table of Permitted Uses provided that these activities do not exceed two days per month.

5.4.3 Special Events

(A) General Standards of Evaluation

2.5.1 Review and Approval Flow Chart

The review and approval process for a Site Plan is shown in the procedure's flowchart.

2.5.2 Application Requirements

(A) Each site plan shall be prepared and sealed by an appropriately licensed professional with the following exceptions:

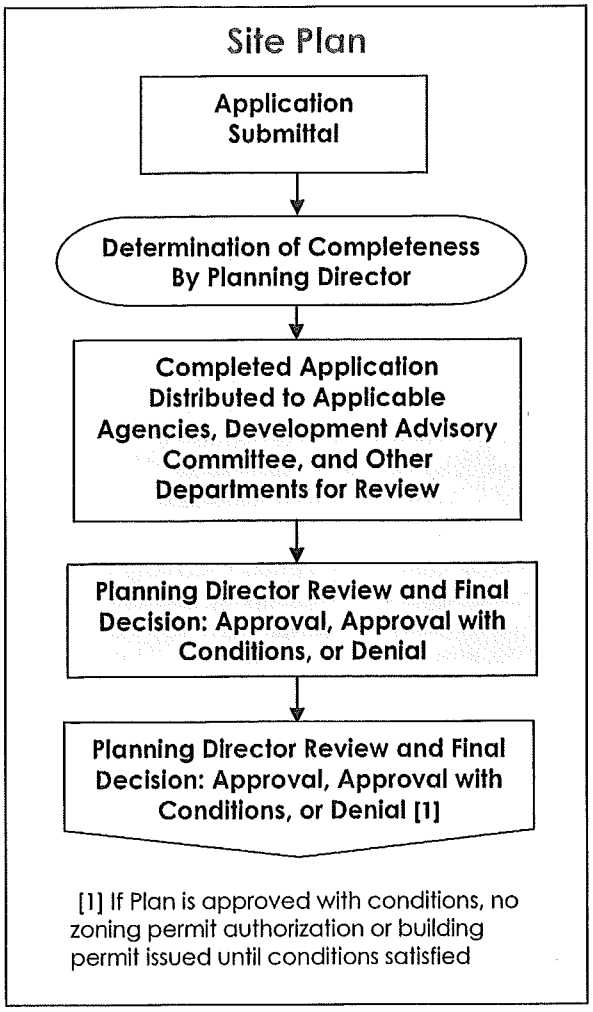
(1) Proposed additions to existing permitted non-residential structures where the use of the structure and lot has not changed and the floor area is not increased more than 25%.

(2) Accessory structures to existing permitted non-residential structures where vehicular use area is not extended and changes to existing grade are not more than one foot in elevation.

(3) Single-family detached dwellings and duplexes, and accessory structures to such uses.

(4) Large day care homes, as defined in Article 10, Definitions.

(5) Rural Guest Establishments with three guestrooms or less - Bed & Breakfasts.



(B) The applicant shall submit to the Planning and Inspections Department:

(1) Three copies of the site plan prepared in accordance with the provisions detailed in this Section. Additional copies may be required depending on the nature and location of the proposed development);.

(2) The completed site plan application form;

(3) A copy of the Orange County tax map with the subject property identified;

(4) Legal documentation, to be approved by the County Attorney, establishing entities responsible for control over common areas and facilities.

(5) Three copies of the Environmental Assessment and/or Environmental Impact Statement, if required under Section 6.16 of this Ordinance.

(6) A statement regarding the method of disposal of trees, limbs, stumps and construction debris associated with the permitted activity. Open burning of trees, limbs, stumps, and/or construction debris associated with the permitted activity is expressly prohibited.

(C) Other items which should be submitted simultaneously, but are not required as part of the site plan application are:

(1) Erosion control and grading plans as necessary to be approved by the Erosion Control Officer for a grading permit, and

(2) Building construction plans to be approved by the Building Official prior to issuance of a building permit.

2.5.3 Plan Specifications

Each site plan shall be drawn at a scale adequate to show required detail and shall contain the following information:

(A) The boundary of the lot(s) to be developed labeled with bearings and distances;

(B) The name, address, and phone number of the applicant and the property owner;

(C) Name of project, vicinity map, north arrow, scale, tax map reference number, date of plan preparation, and subsequent revision dates;

(D) Zoning of the property to be developed and all adjacent zoning and existing adjacent land uses;

(E) Adjacent right-of-way widths with road names and numbers;

(F) A development summary including total acres, proposed use(s), total building square footage, required and proposed parking spaces.

(G) Demonstrated compliance with all applicable performance standards contained in Articles 3, 4, 5, and 6 of this Ordinance;

(H) Maximum and proposed impervious surface and required stream buffers as detailed in Sections 4.2 and 6.12 of this Ordinance;

(I) Estimated traffic generated by the proposed development in trips per day. If the estimate exceeds 800 trips per day, a traffic impact study must be submitted in accordance with Section 6.17;

(J) Front, side, and rear building setbacks as required by Articles 3 and 5 of this Ordinance;

(K) Location of all proposed buildings and structures labeled with floor area, building height and function, and proposed finished floor elevation;

(L) Vehicular use areas including existing and proposed streets and access drives, off street parking and loading to comply with Section 6.9 of this Ordinance, and entry/exit points of adjacent parcels;

(M) Overhead and underground utilities with accompanying easements and storm drainage facilities/easements (including septic tanks and wastewater disposal fields, wells, fire hydrants, irrigation, and security lights);

(N) Solid waste disposal facilities;

(O) All proposed free-standing and wall-mounted signs. Signs must comply with Section 6.12 of this Ordinance;

(P) A landscape plan demonstrating compliance with Section 6.8 of this Ordinance;

(Q) For all developments other than single-family residential and duplexes, existing contour lines (dashed) and proposed contours (solid) at 5-foot intervals with 10-foot contours bold. Where site conditions warrant, 2-foot contours may be required;

(R) Retaining walls, tree wells, or rip rap as part of the grading plan;

(S) Streams, ponds, drainage ditches, swamps, floodway and floodplain boundaries;

(T) Phase lines and numbers if the development is to be phased;

(U) Methods of disposal of trees, limbs, stumps and construction debris associated with the permitted activity. Open burning of trees, limbs, stumps, and/or construction debris associated with the permitted activity is expressly prohibited;

(V) Compliance with County adopted access management, transportation and/or connectivity plans and denote the location of future roadway(s) and access easements, whether public or private, to ensure and encourage future connectivity; and

(W) Additional information may be required based on the site location and the type of development proposed.

2.5.4 Procedures and Timeframes

(A) Upon submission, the Planning Director shall review the site plan application for completeness in form and content according to this Article.

(B) If an application is incomplete, it will be returned to the applicant within five working days.

(C) When a complete application has been accepted, the plan(s) shall be distributed to applicable agencies, DAC, and other departments for review and comment.

(D) The Planning Director shall review the plan(s) based on, but not limited to, the following general criteria:

(1) Compliance with all applicable County ordinances;

(2) Extent and intensity of impacts to the surrounding area;

(3) Respect for existing site conditions, including slope, vegetation, drainage patterns, etc.;

(4) Efficient use of the land to minimize disturbance and grading and to conserve energy;

(5) Safe and efficient vehicular and pedestrian circulation;

(6) Logical placement of structures and other site functions;

(7) No open burning of trees, limbs, stumps and construction debris associated with the permitted activity; and

(8) Compliance with any previously issued Special Use or Conditional Use Permit(s) associated with the project.

(E) Following review of the site plan, the Planning Director shall take final action on the application within 21 days of acceptance of a complete application. Final action shall be one of the following:

(1) Approval,

(2) Approval with conditions, or

(3) Denial.

Failure to meet the criteria for site plan approval listed herein, and/or to address all review comments solicited during plan review, will result in denial of the application.

(F) If a plan is approved with conditions, no zoning authorization allowing land disturbing activity or subsequent building permit shall be issued until all conditions of approval have been met to the satisfaction of Orange County.

(G) Site plan approval and the issuance of a Zoning Compliance Permit does not establish a vested right to develop the property should zoning regulations change subsequent to plan approval.

2.5.5 Vesting of Site Plan

(A) At the option of the Applicant, a site plan may be vested for a period of not less than two nor more than five years. To become vested, a site specific development plan must be approved by the Board of County Commissioners as a Special Use Permit, in accordance with Section 2.7 of this Ordinance. An approved site specific development plan shall contain the following statement: "Approval of this plan establishes a zoning vested right

Appointment of Agent
Skyway Towers Site #: NC-08828

The undersigned Leah Marie Bergman ("Owner") hereby appoints Nexsen Pruet, PLLC as Owner's exclusive agent for the purpose of petitioning Orange County for all necessary zoning, site plan, building permit and other local governmental approvals required for the location of a wireless telecommunications tower on the property located on 5022 Kerley Road, Durham, NC 27705 including, without limitation, the following:

1. To submit the proper applications and the required supplemental materials.
2. To appear at public meetings to give representation and commitments on behalf of the Owner.
3. To act on the Owner's behalf without limitation with regard to any and all things directly or indirectly connected with or arising out of the applications for zoning, site plan, building permit and other local governmental approvals required for the wireless telecommunications tower.

This agency agreement shall continue in effect until written notice of revocation by the Owner is delivered to Orange County.

This the 19 day of March, 2015.

Agent's Name, Address & Telephone

Nexsen Pruet, PLLC

4141 Parklake Avenue, Ste. 200

Raleigh, NC 27612

919-786-2764

Signature of Owner(s)

Leah Marie Bergman

STATE OF NORTH CAROLINA)
)
COUNTY OF Durham)

AFFIRMED and acknowledged to before me this 19 day of March, 2015.

Luz A Martinez Contreras, Notary Public
My Commission Expires: 12-1-2019

LUZ A MARTINEZ CONTRERAS
NOTARY PUBLIC
DURHAM COUNTY, NC

NPRALI:483388.1

NEXSEN PRUET, LLC
PAYEE: ORANGE COUNTY

VENDOR #: 10014276

DATE: 03-12-15
CHECK #: 445069

DATE	INVOICE NUMBER	RESPONSIBLE PARTY	GENERAL LEDGER ACCOUNT	MATTER #	AMOUNT
03-12-15	031215		12100008000000000000	048385-00030	7,000.00
				TOTAL:	7,000.00

NEXSEN PRUET, LLC
ATTORNEYS AND COUNSELORS AT LAW
POST OFFICE DRAWER 2426
COLUMBIA, SOUTH CAROLINA 29202

BANK OF AMERICA ACCOUNT
COLUMBIA, SOUTH CAROLINA

CHECK NO.: 445069

DATE 03/12/15

PAY SEVEN THOUSAND AND 00/100 USD

NET AMOUNT $7,000.00

OPERATING ACCOUNT
VOID AFTER 180 DAYS

NEXSEN PRUET, LLC

PAYEE: ORANGE COUNTY

VENDOR #: 10014276

DATE: 03-12-15

CHECK #: 445070

DATE	INVOICE NUMBER	RESPONSIBLE PARTY	GENERAL LEDGER ACCOUNT	MATTER #	AMOUNT
03-12-15	0312151		56700008000000000000	048385-00030	2,890.00
				TOTAL:	2,890.00

NEXSEN PRUET, LLC
ATTORNEYS AND COUNSELORS AT LAW
POST OFFICE DRAWER 2426
COLUMBIA, SOUTH CAROLINA 29202

BANK OF AMERICA ACCOUNT
COLUMBIA, SOUTH CAROLINA

CHECK NO.: 445070

DATE 03/12/15

PAY TWO THOUSAND EIGHT HUNDRED NINETY AND 00/100 USD

NET AMOUNT $2,890.00

OPERATING ACCOUNT
VOID AFTER 180 DAYS

Site Name: Erwin Road
Property Owner: Leah M. Bergman
Site Address: 5022 Kerley Road, Durham, NC 27705

Project Narrative

Skyway Towers is proposing to build a 125 foot monopole tower with a 4 foot lightning rod at 5022 Kerley Road, near the intersection of Mt. Sinai Road and Erwin Road at the request of T-Mobile, the initial tenant. T-Mobile is seeking to improve voice and data coverage in the residential and commercials areas in the vicinity of the proposed site, particularly along Erwin Road and Mt. Sinai Road. In this area, the coverage is currently spotty and scattered. T-Mobile's goal is to obtain a level of coverage of -84 dBm in this area, which is a measure of signal strength. There is a great demand for service in this area, and T-Mobile's level of service in this area does not reach the level of coverage of -84 dBm. Once the site has been constructed that level of coverage will be provided which will result in the ability of residents and businesses in the area to have sufficient signal strength for dependable in-building voice communication, especially to be able to reach 911 in the event of an emergency, and data service sufficient to effectively utilize today's wireless devices.

T-Mobile provided a search ring, being a circle with a radius of ½ mile, for Skyway Towers to find a site to meet the above objective. As always, Skyway Towers first examined existing structures within the search ring to confirm whether or not T-Mobile could co-locate on those structures. There is an existing American Tower site to the southeast but it did not have sufficient height to meet T-Mobile's service objective. Without any other existing structures on which T-Mobile could co-locate, Skyway Towers found the proposed site on which to build the proposed tower. The tower will be a monopole with flush mounted antennas which will limit the visible profile of the tower. The tower will be galvanized steel in color, which blends in with the surroundings. The tower site will be constructed in compliance with the requirements and standards for such towers contained in the Orange County Unified Development Ordinance including, without limitation, landscaping sufficient to hide the ground equipment.

Durham Public Schools Board of Education
513 Cleveland St.
Durham, NC 27701
Parcel ID: 137841

William G. Waller
3130 Mt. Sinai Rd.
Durham, NC 27705
Parcel ID: 137740

William G. Waller
Mark Weldon Waller
3130 Mt. Sinai Rd.
Durham, NC 27705
Parcel ID: 137741

Karen E. Waller
Mark V. Waller
5005 Kerley Rd.
Durham, NC 27705
Parcel ID: 137739

Mark Weldon Waller
Pamela Puckett Waller
5005 Kerley Rd.
Durham, NC 27705
Parcel ID: 37742

William G. Waller
Mark Waller
5005 Kerley Rd.
Durham, NC 27705
Parcel ID: 137833, 201871

Linda W. Wall
John Alf Wall
3010 Mt. Sinai Rd.
Durham, NC 27705-7905
Parcel ID: 137836

Michael J. Welsh
Eileen P. Welsh
9 Osborne Pl.
Durham, NC 27705-4928
Parcel ID: 137772

Frances Mazzurco
7 Osborne Pl
Durham, NC 27705
Parcel ID: 137773

David C. Pierce
Cristina F. Pierce
11 Osborne Pl
Durham, NC 27705
Parcel ID: 137771

Kerley Road LLC
313 Meadowmont Lane
Chapel Hill, NC 27517
Parcel ID: 137851

NYE Lands LLC Family Investment
2901 N. Duke St.
Group # 4146
Durham, NC 27704-2623
Parcel ID: 215909

Benny P. Weaver
Tammy Morse, et al
5305 Kerley Rd.
Durham, NC 27705
Parcel ID: 137838

801152635
REBECCA ANN HALL
5916 MT SINAI RD
DURHAM, NC 27705

801168852
DAVID C. & CRISTINA F. PIERCE
11 OSBOURNE PL
DURHAM, NC 27707

9891969065
FREDERICK R. BARTRAM
LESLIE J. GILDEMEISTER
5712 MT. SINAI RD.
DURHAM, NC 27705

801069280
LEE RAY BERGMAN, LLC
PO BOX 685
DURHAM, NC 27702

801049713
ROBERT G. & RHONDA P. MISENHEIMER
123 S. CHANNEL HAVEN DR.
WILMINGTON, NC 28409-3509

801175188
MICHAEL D. BEEN
4904 KERLEY RD.
DURHAM, NC 27705

801165116
KELLY A. BARNES
5002 KERLEY RD.
DURHAM, NC 27705

801052406
BEN T. PERRY IV
5806 WILKINS DR.
DURHAM, NC 27705-8584

801155134
ORANGE CO. HEALTHCARE PROPERTIES, INC.
211 EAST DOYLE STREET
TOCCOA, GA 30577

9891977494
GALEN S. & MARILYN B. WAGNER
3726 RANDOLPH RD.
DURHAM, NC 27705-5351

801056813
DAVID E. & SYBIL B. SINK, JR.
5816 MT. SINAI RD.
DURHAM, NC 27705-8613

801058408
BILLY B. & HELEN E. C. OLIVE
5815 MT. SINAI RD.
DURHAM, NC 27705-8614

801168502
WILLIAM G. & HELEN P. WALLER, ETAL
3130 MT. SINAI RD.
DURHAM, NC 27705

801165832
MARGARET A. DIETZ
4908 KERLEY RD.
DURHAM, NC 27705-7115

801154946
MARK W. WALLER
5005 KERLEY RD.
DURHAM, NC 27705-7718

801049963
LUIS A. HERNANDEZ
IDALIA F. MEDINA
6035 WILKINS DR.
DURHAM, NC 27705

801168988
KIMBERLY B. GOTWALS
10 OSBORNE PL
DURHAM, NC 27705

801154533
LEAH MARIE BERGMAN
5022 KERLEY RD.
DURHAM, NC 27705

801151655
RODNEY E. & BARBARA H. NUNN
5912 MT. SINAI RD.
DURHAM, NC 27705

801165414
KELLY A. BARNES
5002 KERLEY RD.
DURHAM, NC 27705-7117

801145891
KERLEY ROAD, LLC
313 MEADOWMONT LN.
CHAPEL HILL, NC 27517

801165631
SUSAN E. SUTTON
SUSAN L. SACHS
4912 KERLEY RD.
DURHAM, NC 27705

801079058
RALPH & RENEE R. SNYDERMAN
5800 TEN SPRINGS LN.
DURHAM, NC 27705

801144550
JONATHAN QUADE
6021 WILKINS DR.
DURHAM, NC 27705

801048582
JONATHAN D. & ALISON V. QUADE ET AL
6021 WILKINS DR.
DURHAM, NC 27705

801048775
BRUCE BURRELL & KATHRYN A. OLIVE
5821 MOUNT SINAI RD.
DURHAM, NC 27705

801063559
RENEE RICE & RALPH SNYDERMAN
PO BOX 9265
CHAPEL HILL, NC 27515

801141934
WILLIAM T. & YVONNE S. WILKINS ETAL
9 PEDESTAL ROCK LN.
DURHAM, NC 27712

801150647
REBECCA ANN HALL
5916 MT. SINAI RD.
DURHAM, NC 27705

801143712
KERLEY ROAD LLC
313 MEADOWMONT LN.
CHAPEL HILL, NC 27517

801168323
MARK W. & PAMELA P. WALLER
5005 KERLEY RD.
DURHAM, NC 27705

801058677
BRENDA H. THOMPSON
227 SMITH DRIVE
DURHAM, NC 27712

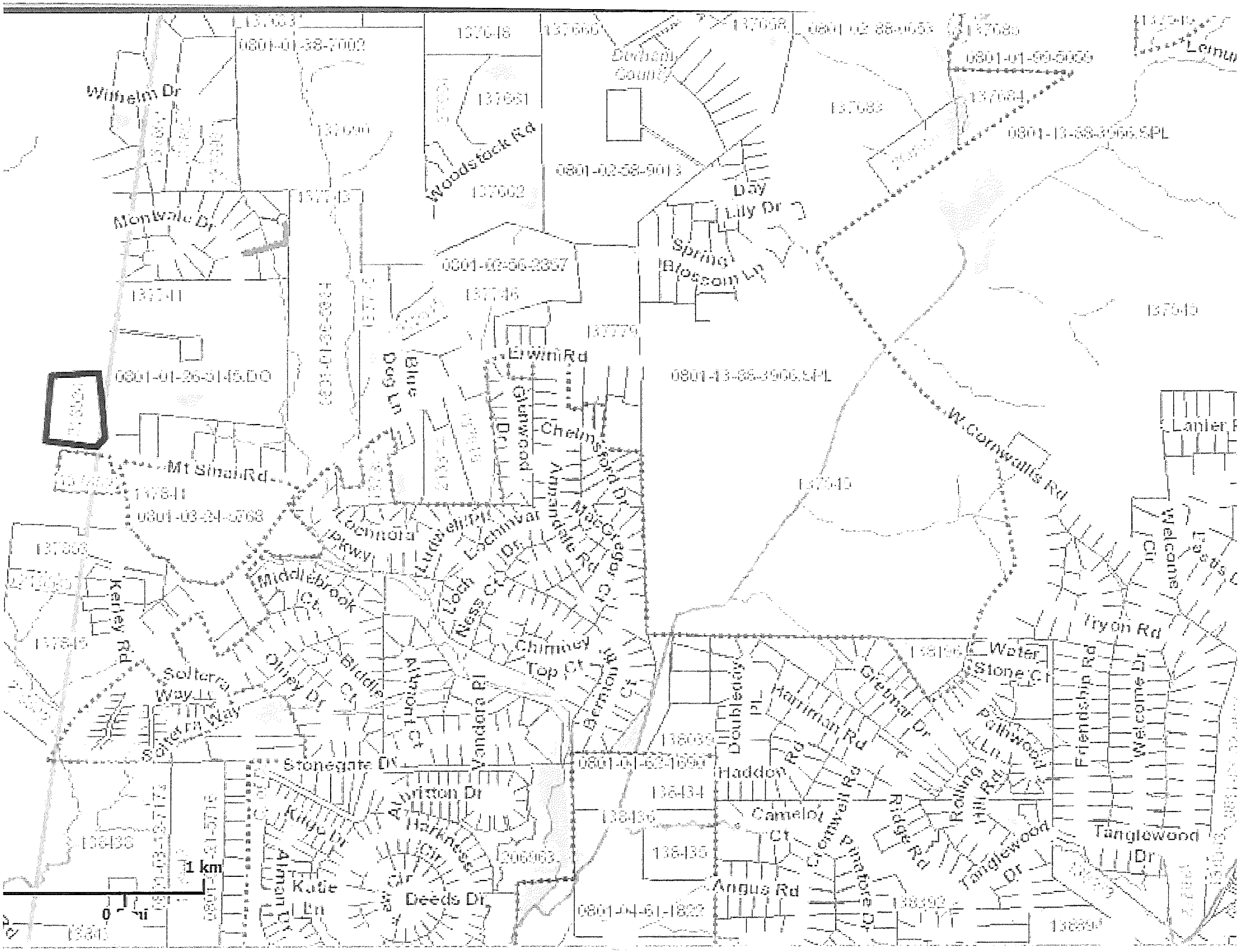
801059391
WILLIAM F. & MELAINA B. HALL
5905 MT. SINAI RD.
DURHAM, NC 27705

Orange County, NC GIS

Tax Map for Erwin Rd. Tower Application

1 inch = 1000 feet

Parcel Search - [PIN = '0801154533'] - 1 Streets Contours 5 Ft Building Footprints


Wilhelm Dr
Woodstock Rd
Montvale Dr
Day
Lily Dr
Spring Blossom Ln
Erwin Rd
Blue Dog Ln
Chelmsford Dr
Mt Sinai Rd
W Cornwallis Rd
Lanier
Welcome Cir
Tryon Rd
Water Stone Ct
Friendship Rd
Tanglewood Dr
Kelley Rd
Solterra Way
Middlebrook Ct
Chimney Top Ct
Stonegate Dr
Deeds Dr
Katie Ln
Doubleday Pl
Hartman Rd
Glenmar Dr
Maddon Rd
Camelot Ct
Angus Rd
Ridge Rd
Rolling Hill Rd
1 km
0

To: Orange County Planning Department
131 West Margaret Lane
P.O. Box 8181
Hillsborough, NC 27278

Affidavit in Support of Application of Skyway Towers, LLC for issuance of a Special Use Permit to construct a new Wireless Telecommunications Tower on the following site:

Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

SKYWAY TOWERS, LLC

Skyway Towers, LLC ("Skyway") is one of the leading independent owners and operators of shared wireless infrastructure. The core business of Skyway involves the engineering, deployment, marketing, ownership, operation and leasing of shared wireless communications sites. The undersigned, as the Project Manager for Skyway Towers, LLC, does hereby affirm and certify as follows:

Section 5.10.8 A(1)(d) Certifications

a. The proposed telecommunication support structure for which the Special Use Permit is being requested will, at all times, be maintained in a safe manner;

b. At all times will be in compliance with all conditions of all applicable permits and authorizations without exception; and

c. At all times will be in compliance with all applicable and permissible local, State and Federal rules and regulations.

Skyway Towers, LLC

By: _____

Name: Justin Jones

Title: Project Manager

Date: **March 27, 2015**

NC LIC No.: C-1794

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Geotech@tepgroup.net

Justin Jones
Skyway Towers
20525 Amberfield Drive, Suite 102
Land O' Lakes, FL 34638
Office: (813) 960-6217

Subject: Subsurface Exploration Report

T-Mobile Designation:	**Site Number:**	5RA0532D
Skyway Towers Designation:	**Site Number:**	NC-08828
	Site Name:	Erwin Road
Engineering Firm Designation:	**TEP Project Number:**	58861.27169
Site Data:	**5022 Kerley Road, Durham, NC 27705 (Orange County)** **Latitude N *35° 59' 26.84"*, Longitude W *78° 59' 42.52"*** **125 Foot - Proposed Monopole Tower**	

Dear Mr. Jones,

Tower Engineering Professionals, Inc. (TEP) is pleased to submit this **"Subsurface Exploration Report"** to evaluate subsurface conditions in the tower area as they pertain to providing support for the tower foundation.

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions in this report are based on the applicable standards of TEP's practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

TEP assumes the current ground surface elevation; tower location and subsequent centerline provided are correct and are consistent with the elevation and centerline to be used for construction of the structure. Should the ground surface elevation be altered and/or the tower location be moved or shifted TEP should be contacted to determine if additional borings are necessary.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The soil conditions may vary from what is represented in the boring log. While some transitions may be gradual, subsurface conditions in other areas may be quite different. Should actual site conditions vary from those presented in this report, TEP should be provided the opportunity to amend its recommendations as necessary.

We at *Tower Engineering Professionals, Inc.* appreciate the opportunity of providing our continuing professional services to you and Skyway Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Report Prepared/Reviewed by: Matthew J. Nanak, E.I. / Stephen W. Nickerson, P.E.

3/27/2015

Respectfully submitted by:

John D. Longest, P.E.

NORTH CAROLINA PROFESSIONAL SEAL 35372 ENGINEER JOHN D. LONGEST

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1) PROJECT DESCRIPTION

Based on the preliminary drawings, it is understood a monopole communications tower will be constructed at the referenced site. The structure loads will be provided by the tower manufacturer.

2) SITE EXPLORATION

The field exploration included the performance of one soil test boring (B-1) to the auger refusal depth of 34 feet (bgs) adjacent to the centerline of the proposed monopole tower. The boring was performed by an ATV mounted drill rig using continuous flight hollow stem augers to advance the hole. Split-spoon samples and Standard Penetration Resistance Values (N-values) were obtained in accordance with ASTM D 1586 at a frequency of four samples in the top 10 feet and one sample every 5 feet thereafter to auger refusal.

The Split-spoon samples were transported to the TEP laboratory where they were classified by a Geotechnical Engineer in general accordance with the Unified Soil Classification System (USCS), using visual-manual identification procedures (ASTM D 2488).

A Boring Location Plan showing the approximate boring location, a Boring Log presenting the subsurface information obtained and a brief guide to interpreting the boring log are included in the Appendix.

3) SITE CONDITIONS

The site is located at 5022 Kerley Road in Durham, Orange County, North Carolina. The proposed tower and compound are to be located in a pasture. The ground topography is lightly sloping.

4) SUBSURFACE CONDITIONS

The following description of subsurface conditions is brief and general. For more detailed information, the individual Boring Log contained in Appendix B - Boring Log may be consulted.

4.1) Soil

The USCS classification of the materials encountered in the boring include OL, SC, SM, SP, and SP-SM. The Standard Penetration Resistance ("N" Values) recorded in the materials ranged from 7 blows per foot of penetration to 50 blows per 1.5 inches of penetration.

4.2) Rock

Rock was not encountered in the boring. Refusal of auger advancement was encountered at a depth of 34 feet (bgs) in the boring.

4.3) Subsurface Water

Subsurface water was encountered at a depth of 12 feet (bgs) in the boring after drilling. It should be noted the subsurface water level will fluctuate during the year, due to seasonal variations and construction activity in the area.

4.4) Frost

The TIA frost depth for Orange County North Carolina is 10 inches.

5) TOWER FOUNDATION DESIGN

Based on the boring data, it is the opinion of TEP that a pier extending to a single large mat foundation or a single drilled shaft can be used to support the new tower. If the drilled shaft foundation option is utilized, design of the foundation should be adjusted to terminate in a known material. The following presents TEP's conclusions and recommendations regarding the foundation types.

5.1) Shallow Foundation

The foundation should bear a minimum of 10 inches below the ground surface to penetrate the frost depth and with sufficient depth to withstand the overturning of the tower. To resist the overturning moment, the weight of the concrete and any soil directly above the foundation can be used. The values are based on the current ground surface elevation.

Based on preliminary site information the site is located on lightly sloping ground, with approximately 3 feet of elevation change across the planned 60 foot fenced compound. It is recommended that foundation designs account for site grades being raised with excavation spoils or that foundation drawings specify minimum embedment depths based on existing site elevations and factor in ground slopes.

Table 1 - Shallow Foundation Analysis Parameters – Boring B-1

Depth		Soil	Static Bearing[1,3] (psf)	Cohesion[2] (psf)	Friction Angle[2] (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	0.1	Topsoil	0	-	-	100	0.30
0.1	3.5	SC	2850	-	31	108	0.38
3.5	6	SM	3800	-	32	110	0.39
6	8.5	SM	3975	-	33	110	0.40
8.5	12	SM	6400	-	44	116	0.50

Notes:
1) The bearing values provided are net allowable with a minimum factor of safety of 2 with anticipated settlement less than 1 inch. Bearing may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
2) These values should be considered ultimate soil parameters
3) The soil values are based on a maximum foundation size of 30 foot squared. If the foundation design size exceeds this dimension TEP should be contacted to re-evaluate soil parameters based on the actual foundation size

5.2) Drilled Shaft Foundation

The following values may be used for design of a drilled shaft foundation. TEP recommends the side frictional and lateral resistance values developed in the top section of the caisson for a depth equal to the half the diameter of the caisson or the frost depth, whichever is greater, be neglected in the calculations. The values are based on the current ground surface elevation.

Table 2 – Drilled Shaft Foundation Analysis Parameters

Depth		Soil	Static Bearing[1] (psf)	Side Frictional Resistance[2] (psf)	Cohesion[3] (psf)	Friction Angle[3] (degrees)	Effective Unit Weight (pcf)
Top	Bottom						
0	0.1	Topsoil	0	0	-	-	100
0.1	3.5	SC	1550	30	-	31	108
3.5	6	SM	3175	80	-	32	110
6	8.5	SM	5075	130	-	33	110
8.5	12	SM	33325	270	-	44	116
12	13.5	SM	34250	340	-	45	54
13.5	18.5	SP	37625	380	-	45	54
18.5	23.5	SP-SM	41225	450	-	45	54
23.5	28.5	SM	44950	520	-	45	54
28.5	33.5	SM	48775	590	-	45	54
33.5	34	SM	49150	620	-	45	54

Notes:

1) The bearing values provided are net allowable with a minimum factor of safety of 2. Bearing may be increased by 1/3 for transient loading (e.g. wind or earthquake loading). If the bearing depth of the foundation is less than 5 diameters below the ground surface the bearing values listed in Table 1 – Shallow Foundation Analysis Parameters should be utilized
2) The side frictional resistance values provided are allowable with a minimum factor of safety of 2. Side frictional resistance values may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
3) These values should be considered ultimate soil parameters

6) SOIL RESISTIVITY

Soil resistivity was performed at the TEP laboratory in accordance with ASTM G187-05 (Standard Test Method for Measurement of Soil Resistivity Using the Two Electrode Soil Box Method). Test results indicated a result of 8,100 ohms/cm.

7) CONSTRUCTION CONSIDERATIONS - SHALLOW FOUNDATION

7.1) Excavation

The boring data indicates excavation to the expected subgrade level for the shallow foundation will extend through sand. A large tracked excavator should be able to remove the materials with little difficulty.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. It is the responsibility of the contractor for site safety. This information is provided as a service and under no circumstance should TEP be assumed responsible for construction site safety.

7.2) Dewatering/Foundation Evaluation/Subgrade Preparation

As previously discussed, subsurface water was encountered in the boring at a depth of 12 feet (bgs). Therefore, dewatering (using pumped sumps or well points) may be required for construction purposes at this site. The subsurface water level should be kept below the bottom level of any excavation.

After dewatering and excavation to the design elevation for the footing, the materials should be evaluated by a Geotechnical Engineer or a representative of the Geotechnical Engineer prior to reinforcement and concrete placement. This evaluation should include probing, shallow hand auger borings and dynamic cone penetrometer testing (ASTM STP-399) to help verify that suitable residual material lies directly under the foundation and to determine the need for any undercut and replacement of unsuitable materials. Loose surficial material should be compacted in the excavation prior to reinforcement and concrete placement to stabilize surface soil that may have become loose during the excavation process. TEP recommends a 6-inch layer of compacted crushed stone be placed just after excavation to aid in surface stability.

The soils encountered in the boring will deteriorate rapidly once disturbed and exposed to the weather. It is recommended that precautions be made to prevent soils from prolonged exposure, such as placing rebar and concrete soon after excavating soils and/or the placement of a mud mat to protect sensitive soils prior to the placement of rebar and concrete.

7.3) Fill Placement and Compaction

Backfill materials placed above the shallow foundation to the design subgrade elevation should not contain more than 5 percent by weight of organic matter, waste, debris or any otherwise deleterious materials. To be considered for use, backfill materials should have a maximum dry density of at least 100 pounds per cubic foot as determined by standard Proctor (ASTM D 698), a Liquid Limit no greater than 40, a Plasticity Index no greater than 20, a maximum particle size of 4 inches, and 20 percent or less of the material having a particle size between 2 and 4 inches. Because small handheld or walk-behind compaction equipment will most likely be used, backfill should be placed in thin horizontal lifts not exceeding 6 inches (loose).

Fill placement should be monitored by a qualified Materials Technician working under the direction of a Geotechnical Engineer. In addition to the visual evaluation, a sufficient amount of in-place field density tests should be conducted to confirm the required compaction is being attained.

7.4) Reuse of Excavated Soil

The sand that meets the above referenced criteria can be utilized as backfill based on dry soil and site conditions at the time of construction.

8) CONSTRUCTION CONSIDERATIONS - DRILLED SHAFTS

Based on TEP's experience a conventional drilled shaft rig (Hughes Tool LDH or equivalent) can be used to excavate to the auger refusal depth of TEP's boring. An earth auger can typically penetrate the materials encountered to the auger refusal depth of the boring with little to severe difficulty. Materials below the auger refusal depth may require a coring bit or roller-bit to remove the material. Special excavation equipment may be necessary for a shaft greater that 60-inches in diameter. If hole collapse is encountered during construction, the design and geotechnical engineers should be contacted immediately to make any necessary adjustments.

Due to the subsurface water and the sandy soil, the contractor should utilize the "slurry" method for shaft construction. The following are general procedure recommendations in drilled shaft construction using the "slurry" method:

1) Slurry drilled shafts are constructed by conventional caisson drill rigs excavating beneath a drilling mud slurry. Typically, the slurry is introduced into the excavation after the groundwater table has been penetrated and/or the soils on the sides of the excavation are observed to be caving-in. When the design shaft depth is reached, fluid concrete is placed through a tremie pipe at the bottom of the excavation.

2) The slurry level should be maintained at a minimum of 5 feet or one shaft diameter, whichever is greater, above the subsurface water level.

3) Inspection during excavation should include verification of plumbness, maintenance of sufficient slurry head, monitoring the specific gravity, pH and sand content of the drilling slurry, and monitoring any changes in the depth of the excavation between initial approval and prior to concreting.

4) TEP approves of the use of a removable steel casing in the shaft excavation to prevent caving of the excavation sides due to excavation disturbance and soil relaxation. Loose soils in the bottom of the shaft should be removed.

5) The specific gravity or relative density of the drilling mud slurry should be monitored from the initial mixing to the completion of the excavation. An increase in the specific gravity or density of the drilling slurry by as much as 10 percent is indicative of soil particles settling out of the slurry onto the bottom of the excavation. This settling will result in a reduction of the allowable bearing capacity of the bottom of the drilled shaft.

6) After approval, the drilled shaft should be concreted as soon as practical using a tremie pipe.

7) For slurry drilled shafts, the concrete should have a 6 to 8 inch slump prior to discharge into the tremie. The bottom of the tremie should be set at about one tremie pipe diameter above the excavation. A closure flap at the bottom of the tremie should be used, or a sliding plug introduced into the tremie before the concrete, to reduce the potential for the concrete being contaminated by the slurry. The bottom of the tremie must be maintained in concrete during placement, which should be continuous.

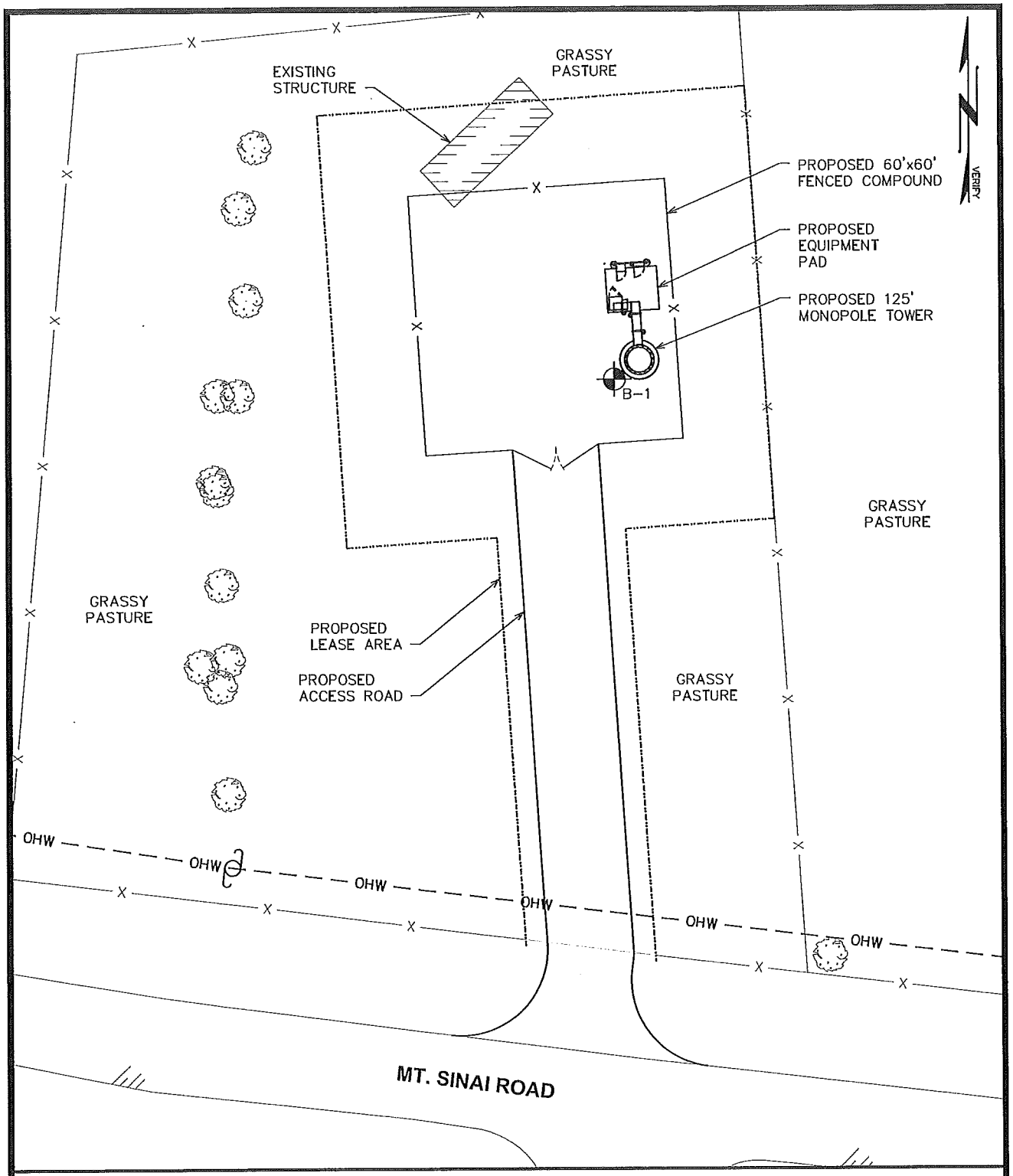
8) The protective steel casing should be extracted as concrete is placed. A head of concrete should be maintained above the bottom of the casing to prevent soil and water intrusion into the concrete below the casing.

9) Additional concrete should be placed via the tremie causing the slurry to overflow from the excavation in order to reduce the likelihood of slurry pockets remaining in the drilled shaft.

If variability in the subsurface materials is encountered, a representative of the Geotechnical Engineer should verify that the design parameters are valid during construction. Modification to the design values presented above may be required in the field.

APPENDIX A

BORING LAYOUT



BORING LAYOUT

SCALE: N.T.S.

PREPARED BY:	PREPARED FOR:	PROJECT INFORMATION:	
TOWER ENGINEERING PROFESSIONALS 326 TRYON ROAD RALEIGH, NC 27603 (919) 661-6351 www.tepgroup.net	SKYWAY TOWERS 20525 AMBERFIELD DR, STE 102 LAND O' LAKES, FL 34639 (813) 960-6210	**ERWIN ROAD** **SITE #: NC-08828** 5022 KERLEY ROAD DURHAM, NC 27705 (ORANGE COUNTY)	REVISION: 0 TEP JOB #:58861.27169 SHEET NUMBER: **C-1**

APPENDIX B

BORING LOG

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
Telephone: 919-661-6351
Email: Geotech@tepgroup.net

LOG OF BORING B-1

PROJECT	SITE ID:	TEP NO.:
Erwin Road	NC-08828	58861.27169

DATE STARTED	DRILLING METHOD	HOLE SIZE	CITY, STATE
3/26/2015	Hollow Stem Auger	2 1/4in	Durham, North Carolina

DATE COMPLETE	HAMMER WEIGHT/FALL	HAMMER TYPE	TOTAL DEPTH	DRILL RIG TYPE
3/26/2015	140lbs / 30in	Rope & Cathead	34.0 FT	CME 450

GROUND EL.	LOGGED BY	CHECKED BY	BACKFILL	DEPTH/EL. GROUNDWATER
372.9	MJN	TAD	Cuttings	▽ 12.0/360.9 AD

BORING LOCATION: Adjacent to centerline of proposed tower

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) / REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
			372.8		0.0-0.1: Topsoil - 1 Inch				
S1	18	3-2-5 (7)			0.1-3.5: Loose, light brown, fine to coarse clayey SAND (SC), moist				
			369.4						
S2	18	3-4-5 (9)		5	3.5-6.0: Loose, reddish brown, fine to coarse silty SAND (SM), with clay, moist				
			366.9						
S3	18	4-5-6 (11)			6.0-8.5: to medium dense, light brown				
			364.4						
S4	18	8-15-26 (41)		10	8.5-13.5: to dense	Driller Note: Hard drilling at 9.2 feet Driller Note: Very hard drilling at 12 feet			
			359.4						
S5	5	50/5"		15	13.5-18.5: Very dense, light brown, fine to coarse poorly-graded SAND (SP), trace silt, moist	Driller Note: Partially weathered rock			
			354.4						
S6	11	15-50/5"		20	18.5-23.5: Very dense, brown, fine to coarse poorly-graded SAND (SP-SM), with silt, moist				
			349.4						
S7	5	50/5"		25	23.5-28.5: Very dense, light brown, fine to coarse silty SAND (SM), moist	Driller Note: Partially weathered rock			
			344.4						
S8	5	50/5"		30	28.5-34.0: wet	Driller Note: Advanced auger with much difficulty from 31.5 to 34 feet			
S9	1.25	50/1"	338.9	35	34.0: Boring Terminated - Auger Refusal	Driller Note: Partially weathered rock			

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
Telephone: 919-661-6351
Email: Geotech@tepgroup.net

Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	SPT Blow Count
Very Loose	< 4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	SPT Blow Count
Very Soft	< 2
Soft	2 to 4
Medium Stiff	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	> 30

GENERAL NOTES

1. Classifications are bases on the Unified Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations and should be considered approximate.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface condition at other locations or times.

Group Symbols	Typical Names
GW	Well-graded gravels, gravel-sand mixtures, little or no fines
GP	Poorly-graded gravels, little or no fines/sands
GM	Silty gravels, gravel-sand-silt mixtures
GC	Clayey gravels, gravel-sand-silt mixtures
SW	Well-graded sands, gravelly sands, little or no fines
SP	Poorly-graded sands, little or no fines/sands/gravels
SM	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures
ML	Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OL	Organic silts and organic silty clays of low plasticity
MH	Inorganic silts, micaceous or distomaceous fine sandy or silty soils, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity, organic silts
PT	Peat and other highly organic soils

Sampler Symbols

- Split Spoon
- Standard Penetration Test (SPT)
- Pushed Shelby Tube
- Auger Cuttings
- Grab Sample
- Dynamic Cone Penetrometer
- Hand Auger
- Rock Core

Log Abbreviations

ATD - At Time of Drilling
AD - After Drilling
EOD - End of Drilling
RMR - Rock Mass Rating
WOH - Weight of Hammer
WOR - Weight of Rod
REC - Rock Core Recovery
RQD - Rock Quality Designation

Information Regarding This Subsurface Exploration Report

The information contained in this report has been specifically tailored to the needs of the client at the time the report was provided, for the specific purpose of the project named in this report. The attached report may not address the needs of contractors, civil engineers, or structural engineers. Anyone other than the named client should consult with the geotechnical engineer prior to utilizing the information contained in the report.

It is always recommended that the full report be read. While certain aspects of the report may seem unnecessary or irrelevant; just as each project and site are unique, so are the subsurface investigation reports and the information contained in them. Several factors can influence the contents of these reports, and the geotechnical engineer has taken into consideration the specific project, the project location, the client's objectives, potential future improvements, etc. If there is any question about whether the attached report pertains to your specific project or if you would like to verify that certain factors were considered in the preparation of this report, it is recommended that you contact the geotechnical engineer.

Geotechnical subsurface investigations often are prepared during the preliminary stages of a project and aspects of the project may change later on. Some changes may require a report revision or additional exploration. Some changes that often need to be brought to the attention of the geotechnical engineer include changes in location, size and/or type of structure, modifications to existing structures, grading around the project site, etc. Some naturally occurring changes can also develop that impact the information contained in this geotechnical report such as earthquakes, landslides, floods, subsurface water levels changing, etc. It is always recommended that the geotechnical be informed of known changes at the project site.

Subsurface exploration reports are generated based on the analysis and professional opinions of a geotechnical engineer based on the results of field and laboratory data. Often subsurface conditions can vary – sometimes significantly – across a site and over short distances. It often is helpful to retain the geotechnical engineer's services during the construction process. Otherwise, the geotechnical cannot assume responsibility or liability for report recommendations which may have needed to change based on changing site conditions or misinterpretation of recommendations.

Geotechnical engineers assemble testing and/or boring logs based on their interpretation of field and laboratory data. Testing and/or boring logs should always be coupled with the subsurface exploration report. The geotechnical engineer and Tower Engineering Professionals cannot be held reliable for interpretations, analyses, or recommendations based solely on the testing and/or boring log if it is independent of the prepared report.

The scope of the subsurface exploration report does not include an assessment or analysis of environmental conditions, determination of the presence or absence of wetlands or hazardous or toxic materials on or below the ground surface. Any notes regarding odors, fill, debris, or anything of that nature are offered as general information for the client, often to help identify or delineate natural soil boundaries.

For additional information, please contact the geotechnical engineer named in the attached report.

TOWER
ENGINEERING
PROFESSIONALS

SKYWAY TOWERS
20525 Amberfield Dr., Suite 102, Land O Lakes, FL 34638

Page 1 of 3		Job Number:	40915-0042
Eng: MFP		Customer Ref:	
		Date:	3/30/2015
Structure:	125-FT MONOPOLE		
Site:	NC-08828 ERWIN RD.		
Location:	ORANGE CO., NC / 35°59'26.84", -78°59'42.52"		
Owner:	SKYWAY TOWERS		
Revision No.:	Revision Date:		

DESIGN			
Building Code: 2012 NORTH CAROLINA BUILDING CODE			
Design Standard: ANSI/TIA-222-G-2			
Wind Speed Load Cases: 3-SEC. GUSTED WIND SPEED			
Load Case #1: 90 MPH Design Wind Speed			
Load Case #2: 30 MPH Wind with 0.75" Ice Accumulation			
Load Case #3 60 MPH Service Wind Speed			
Structure Class	Exposure Cat.	Topography Cat.	Crest Height
II	C	I	

EQUIPMENT LIST

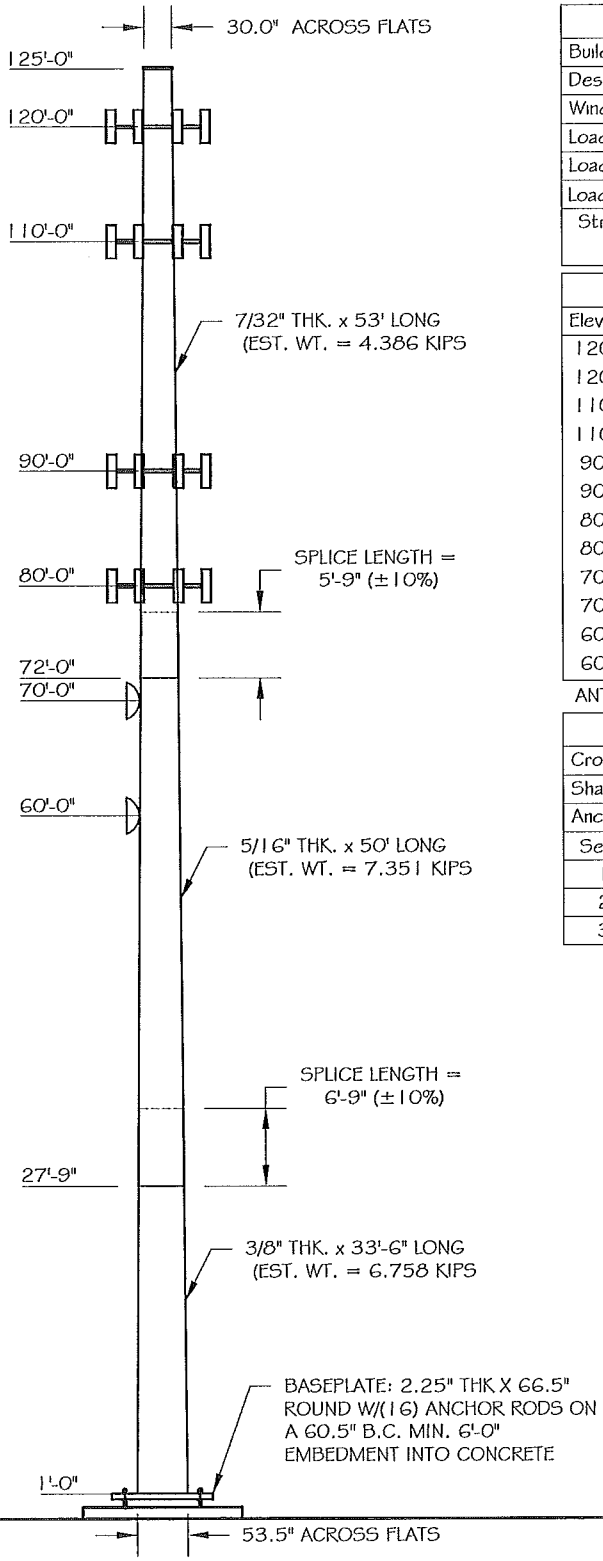
Elev.	Description
120	(12) PANEL (EPA 200 FT2 / 4000 LBS)
120	LOW PROFILE PLATFORM
110	(12) PANEL (EPA 200 FT2 / 4000 LBS)
110	LOW PROFILE PLATFORM
90	(12) PANEL (EPA 200 FT2 / 4000 LBS)
90	LOW PROFILE PLATFORM
80	(12) PANEL (EPA 175 FT2 / 4000 LBS)
80	LOW PROFILE PLATFORM
70	(1) 8-FT STD. MICROWAVE DISH
70	MICROWAVE MOUNT
60	(1) 8-FT STD. MICROWAVE DISH
60	MICROWAVE MOUNT

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE

STRUCTURE PROPERTIES

Cross-Section: 18-SIDED	Taper: 0.19808 in/ft
Shaft Steel: ASTM A572 GR 65	Baseplate Steel: ASTM A572 GR 55
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0" LONG	

Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	53.00	0.2188	5.75	30.00	40.50
2	50.00	0.3125	6.75	38.92	48.83
3	33.50	0.3750	0.00	46.86	53.50



NORTH CAROLINA PROFESSIONAL SEAL 032804 ENGINEER MICHAEL F. PLAHOVINSAK
3.30.2015
MICHAEL F. PLAHOVINSAK, P.E. LIC. #032804
614-598-6250 / mike@mfperq.com

BASE REACTIONS FOR FOUNDATION DESIGN

Moment:	4550 ft-kip
Shear:	51 kip
Axial:	51 kip

SKYWAY TOWERS
20525 Amberfield Dr., Suite 102, Land O Lakes, FL 34638

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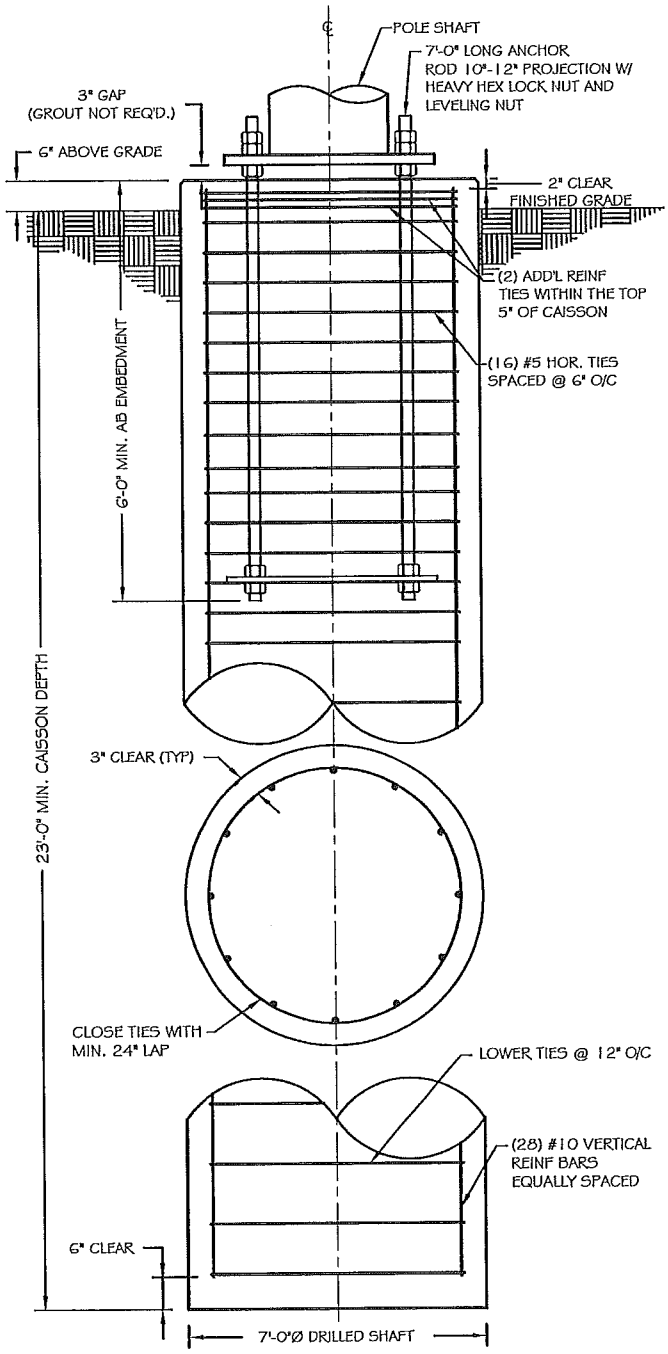

CAISSON FOUNDATION

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.46 AND SHALL BE AIR ENTRAINED 6% (±1.5%). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.

2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

3. CAISSON FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 336, "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DRILLED PIERS", LATEST EDITION.

4. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

5. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
   ENGINEER: TOWER ENGINEERING PROFESSIONALS
   REPORT NO.: 58861.27169 (DATED 3/27/15)

6. ESTIMATED CONCRETE VOLUME = 33 CUBIC YARDS.

7. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
   MOMENT: 4550 FT*KIPS
   SHEAR: 51 KIPS
   AXIAL: 51 KIPS

8. GEOTECHNICAL REPORT INDICATES GROUNDWATER MAY BE ENCOUNTERED AT 12'-0" BELOW GRADE.

NORTH CAROLINA PROFESSIONAL SEAL 032804 MICHAEL F. PLAKOVANSAK ENGINEER
3.30.2015

MICHAEL F. PLAKOVANSAK, P.E., LC. #032804
614-398-6290 / mike@mfpcorp.com

SKYWAY TOWERS
20525 Amberfield Dr., Suite 102, Land O Lakes, FL 34638

Page 3 of 3		Job Number:	40915-0042
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Revision No.:	Revision Date:		

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.46 AND SHALL BE AIR ENTRAINED 6% (±1.5%). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.

2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

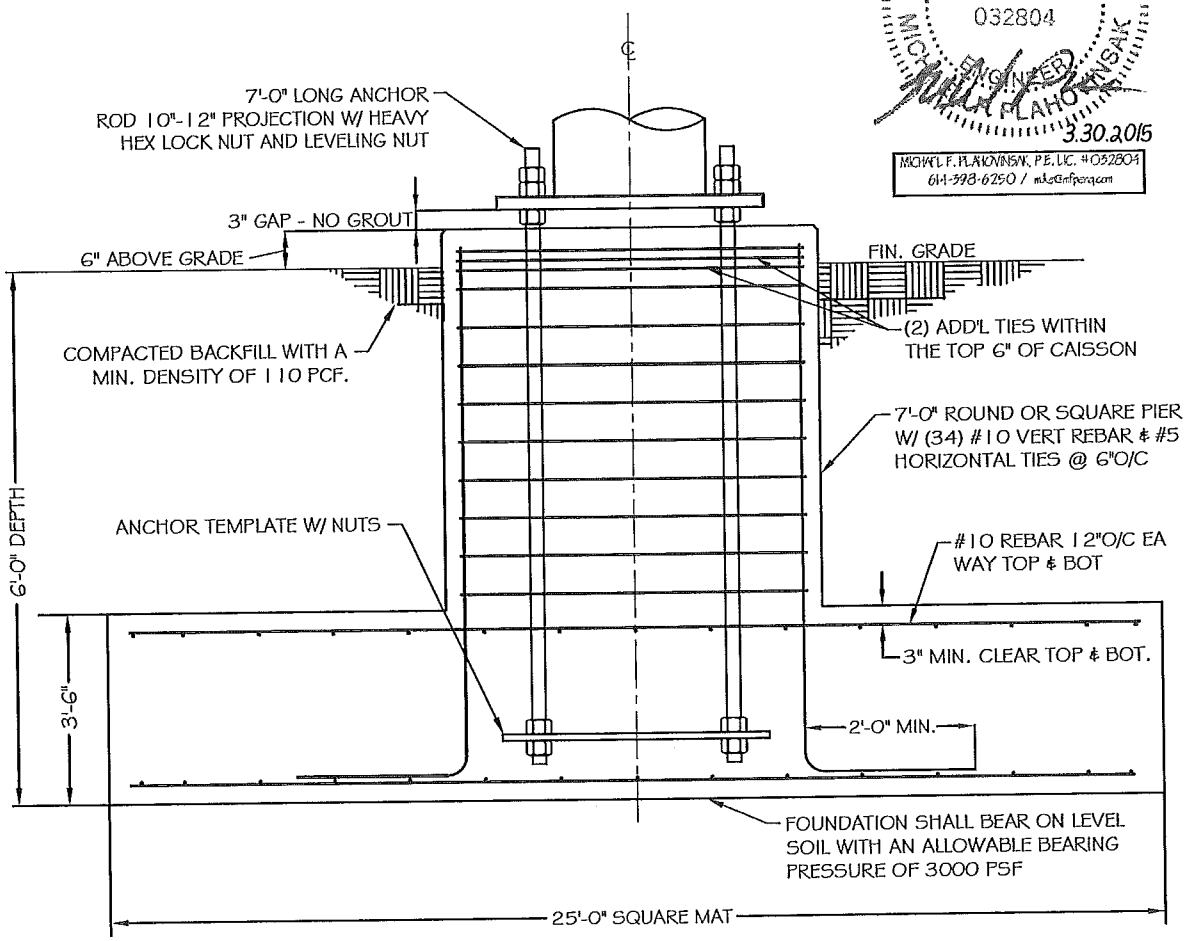
4. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

3. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: TOWER ENGINEERING PROFESSIONALS
REPORT NO.: 58861.27169 (DATED 3/27/15)

4. ESTIMATED CONCRETE VOLUME = 86 CUBIC YARDS.

5. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 4550 FT*KIPS
SHEAR: 51 KIPS
AXIAL: 51 KIPS

NORTH CAROLINA PROFESSIONAL SEAL 032804 ENGINEER MICHAEL F. PLAKONINSAK
3.30.2015
MICHAEL F. PLAKONINSAK, P.E. LIC. #032804
614-598-6250 / mike@mfpeng.com



SPREAD FOOTING

Tower Input Data

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

Tower is located in Orange County, North Carolina.
Basic wind speed of 90 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 30 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	125.00-72.00	53.00	5.75	18	30.0000	40.5000	0.2188	0.8750	A572-65 (65 ksi)
L2	72.00-27.75	50.00	6.75	18	38.9233	48.8300	0.3125	1.2500	A572-65 (65 ksi)
L3	27.75-1.00	33.50		18	46.8676	53.5000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	30.4628	20.6775	2316.9742	10.5723	15.2400	152.0324	4636.9972	10.3407	4.8950	22.377
	41.1248	27.9678	5733.2549	14.2998	20.5740	278.6651	11474.0538	13.9865	6.7430	30.825
L2	40.6806	38.2971	7213.1083	13.7069	19.7731	364.7947	14435.7077	19.1522	6.3005	20.162
	49.5833	48.1233	14311.6477	17.2237	24.8056	576.9514	28642.1271	24.0662	8.0441	25.741
L3	48.9476	55.3378	15112.1829	16.5049	23.8087	634.7325	30244.2508	27.6742	7.5887	20.237
	54.3253	63.2320	22546.1540	18.8594	27.1780	829.5737	45121.9749	31.6220	8.7560	23.349

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8"	C	No	Inside Pole	120.00 - 1.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	110.00 - 1.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	90.00 - 1.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	80.00 - 1.00	12	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	70.00 - 1.00	2	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	60.00 - 1.00	2	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	C	None		0.0000	120.00	No Ice	200.00	200.00	4.00
						1/2" Ice	220.00	220.00	4.20
						1" Ice	240.00	240.00	4.40
Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	C	None		0.0000	110.00	No Ice	200.00	200.00	4.00
						1/2" Ice	220.00	220.00	4.20
						1" Ice	240.00	240.00	4.40
Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	C	None		0.0000	90.00	No Ice	200.00	200.00	4.00
						1/2" Ice	220.00	220.00	4.20
						1" Ice	240.00	240.00	4.40
Panel Antennas w/ mounting (175 ft2 / 4000 lbs)	C	None		0.0000	80.00	No Ice	175.00	175.00	4.00
						1/2" Ice	195.00	195.00	4.20
						1" Ice	215.00	215.00	4.40

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
8 ft standard	A	Paraboloid w/o Radome	From Face	1.00	0.0000		70.00	8.00	No Ice	50.27	1.00
				0.00					1/2" Ice	51.32	1.20
				0.00					1" Ice	52.37	1.40
8 ft standard	A	Paraboloid w/o Radome	From Face	1.00	0.0000		60.00	8.00	No Ice	50.27	1.00
				0.00					1/2" Ice	51.32	1.20
				0.00					1" Ice	52.37	1.40

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 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 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	125 - 72	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	8	-31.41	0.12	0.07
			Max. Mx	4	-22.48	-926.73	-1.11
			Max. My	6	-22.51	-1.73	-926.39
			Max. Vy	4	39.56	-926.73	-1.11
			Max. Vx	6	39.54	-1.73	-926.39
			Max. Torque	7			0.01
L2	72 - 27.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-49.81	9.02	5.21
			Max. Mx	4	-36.49	-2877.16	-99.16
			Max. My	6	-36.54	-160.70	-2841.90
			Max. Vy	4	48.41	-2877.16	-99.16
			Max. Vx	6	47.20	-160.70	-2841.90
			Max. Torque	2			9.72
L3	27.75 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-64.72	8.97	5.18
			Max. Mx	4	-49.27	-4531.07	-208.67
			Max. My	6	-49.27	-338.56	-4455.42
			Max. Vy	4	50.13	-4531.07	-208.67
			Max. Vx	6	48.93	-338.56	-4455.42
			Max. Torque	2			9.70

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 72	19.344	13	1.2080	0.0009
L2	77.75 - 27.75	8.137	13	0.9513	0.0008
L3	34.5 - 1	1.617	13	0.4228	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	13	18.078	1.1900	0.0042	55014
110.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	13	15.569	1.1517	0.0043	18338
90.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	13	10.788	1.0474	0.0043	7858
80.00	Panel Antennas w/ mounting (175 ft2 / 4000 lbs)	13	8.603	0.9713	0.0041	6117
70.00	8 ft standard	13	6.613	0.8736	0.0037	5231
60.00	8 ft standard	13	4.851	0.7574	0.0031	4593

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 72	78.474	4	4.9025	0.0068
L2	77.75 - 27.75	33.027	4	3.8644	0.0049
L3	34.5 - 1	6.559	4	1.7152	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	4	73.343	4.8304	0.0173	13781
110.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	4	63.168	4.6760	0.0178	4592
90.00	Panel Antennas w/ mounting (200 ft2 / 4000 lbs)	4	43.781	4.2542	0.0178	1965
80.00	Panel Antennas w/ mounting (175 ft2 / 4000 lbs)	4	34.919	3.9458	0.0168	1528
70.00	8 ft standard	4	26.840	3.5487	0.0150	1301
60.00	8 ft standard	4	19.690	3.0759	0.0126	1138

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	125 - 72 (1)	TP40.5x30x0.2188	53.00	0.00	0.0	27.1768	-22.48	1619.76	0.014
L2	72 - 27.75 (2)	TP48.83x38.9233x0.3125	50.00	0.00	0.0	46.7968	-36.49	3032.88	0.012
L3	27.75 - 1 (3)	TP53.5x46.8676x0.375	33.50	0.00	0.0	63.2320	-49.27	4207.71	0.012

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	125 - 72 (1)	TP40.5x30x0.2188	926.73	1306.68	0.709	0.00	1306.68	0.000
L2	72 - 27.75 (2)	TP48.83x38.9233x0.3125	2878.87	2946.04	0.977	0.00	2946.04	0.000
L3	27.75 - 1 (3)	TP53.5x46.8676x0.375	4535.88	4600.26	0.986	0.00	4600.26	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	125 - 72 (1)	TP40.5x30x0.2188	39.56	809.88	0.049	0.00	2616.54	0.000
L2	72 - 27.75 (2)	TP48.83x38.9233x0.3125	48.52	1516.44	0.032	1.65	5899.29	0.000
L3	27.75 - 1 (3)	TP53.5x46.8676x0.375	50.23	2103.86	0.024	1.65	9211.75	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	125 - 72 (1)	0.014	0.709	0.000	0.049	0.000	0.725 ✔	1.000	4.8.2 ✔
L2	72 - 27.75 (2)	0.012	0.977	0.000	0.032	0.000	0.990 ✔	1.000	4.8.2 ✔
L3	27.75 - 1 (3)	0.012	0.986	0.000	0.024	0.000	0.998 ✔	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	125 - 72	Pole	TP40.5x30x0.2188	1	-22.48	1619.76	72.5	Pass
L2	72 - 27.75	Pole	TP48.83x38.9233x0.3125	2	-36.49	3032.88	99.0	Pass
L3	27.75 - 1	Pole	TP53.5x46.8676x0.375	3	-49.27	4207.71	99.8	Pass
							Summary	
						Pole (L3)	99.8	Pass
						RATING =	**99.8**	**Pass**

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Plain City, OH 43064
Phone: 614-398-6250
email: mike@mfpeng.com

Job	Page
125-ft monopole - MFP #40915-0042	BP-G
Project	**Date**
NC-08828 Erwin Rd.	03/30/2015
Client	**Designed by**
SKYWAY TOWERS	Mike

Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G-2

Factored Base Reactions:		*Pole Shape:*	*Anchor Rods:*	*Base Plate:*
Moment:	4536 ft-kips	18-Sided	(16) 2.25 in. A615 GR. 75	2.25 in. x 66.5 in. Rounc
Shear:	50 kips	*Pole Dia. (D_f):*	Anchor Rods Evenly Spaced	fy = 55 ksi
Axial:	49 kips	53.50 in	On a 60.5 in Bolt Circle	

Anchor Rod Calculation According to TIA-222-G section 4.9.9

$\phi =$ 0.80 TIA 4.9.9

$I_{bolts} =$ 7320.50 in^2 Momet of Inertia

$P_u =$ 225 kips Tension Force

$V_u =$ 3 kips Shear Force

$R_{nt} =$ 325.00 kips Nominal Tensile Strength

$\eta =$ 0.50 for detail type (d)

The following Interation Equation Shall Be Satisfied:

$$\left(\frac{P_u + \frac{V_u}{\eta}}{\phi R_{nt}}\right) \leq 1.0$$

$$0.889 \leq 1$$

Base Plate Calculation According to TIA-222-G

$\phi =$ 0.90 TIA 4.7

$M_{PL} =$ 541.5 in-kip Plate Moment

$L =$ 10.5 in Section Length

$Z =$ 13.3 Plastic Section Modulus

$M_P =$ 731.2 in-kip Plastic Moment

$\phi M_n =$ 658.1 in-kip Factored Resistance

Calculated Moment vs Factored Resistance

541.47 in-kip $\leq$ 658 in-kip

Anchor Rods Are Adequate	**88.9%**	☑
Base Plate is Adequate	**82.3%**	☑

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Job: 125-ft monopole - MFP #40915-0042		Page: FND
Project: NC-08828 Erwin Rd.		Date: 03/30/2015
Client: SKYWAY TOWERS		Designed by: Mike

Caisson Calculation

According to ANSI/TIA-222-G-2

1. Foundation overturning resistance calculated with PLS Caisson, for Brom's method for rigid piles. Soil layers modeled after recommendations from the geotechnical report.
2. Cohesion strength for the upper 6 ft has been reduced by 50%
3. In lieu of a soil resistance factor fs = 0.75 (TIA-9.4.1) an additional safey fator against soil failure of 1.33 has been applied.
4. Foundation is designed with a minimum safety factor resisting overturning of 2.0
5. Foundation has been designed with factored loads per TIA-222-G.
6. Design water table = 12 ft below grade

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 4.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 7.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	S	4.00	0.00	0.0		1.000	-0.00
2	S	2.00	4.00	110.0		3.255	32.00
3	S	2.50	6.00	110.0		3.392	33.00
4	S	4.50	8.50	116.0		5.550	44.00
5	S	20.00	13.00	54.0		5.828	45.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 4550.0 VERTICAL (k) = 51.0 SHEAR (k) = 51.0
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33

*** CALCULATED PIER LENGTH (ft) = 23.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
S	0.50	4.00	0.0		1.000	0.00	3.17
S	4.50	2.00	110.0		3.255	15.04	5.83
S	6.50	2.50	110.0		3.392	63.66	7.91
S	9.00	4.50	116.0		5.550	396.50	11.51
S	13.50	4.22	54.0		5.828	584.32	15.68
S	17.72	5.78	54.0		5.828	-990.82	20.72

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)
0.00	68.7	6210.1	51.5	4657.6
2.35	68.7	6371.5	51.5	4778.6
4.70	68.6	6532.9	51.4	4899.7
7.05	43.9	6673.5	32.9	5005.2
9.40	-34.2	6702.6	-25.6	5027.0
11.75	-219.8	6418.9	-164.8	4814.2
14.10	-482.4	5610.4	-361.8	4207.8
16.45	-802.4	4107.9	-601.8	3080.9
18.80	-822.6	1990.4	-617.0	1492.8
21.15	-429.6	511.9	-322.2	383.9
23.50	0.0	0.0	0.0	0.0

*** TOTAL REINFORCEMENT PCT = 0.60 REINFORCEMENT AREA (in^2) = 33.25
*** USABLE AXIAL CAP. (k) = 51.0 USABLE MOMENT CAP. (ft-k) = 5109.7

For Design:

7-ft Diameter caisson x 23.5-ft long (23-ft Embeded with 0.5-ft above grade)
Concrete strength =4000 PSI @ 28 days. Estimated Concrete Volume = 33 CY3.
(28) #10 Vertical Rebar. Steel Cross-Section = 35.56 in2

Monopole Spread Footing Calculation

ANSI/TIA-222-G-2

Factored Base Reactions:		**Footing Dimensions:**		**Concrete:**
Moment:	4550 ft-kips	25 ft x 25 ft	7 ft Square Pier	f'c = 4000 psi
Shear:	51 kips	x 3.5 ft thick	w/6 in Reveal	Steel fy = 60 ksi
Axial:	51 kips	Bearing 6 ft B.G.	86.5 Yd3 Concrete	f = 0.75
Soil Backfill	110 pcf	Ultimate Bearing:	6000 psf	Water Table n/a

Foundation Weight

Weight of Pole	51.0 kips
Weight of Concrete	350.175 kips
Weight of Soil	158.4 kips
Bouyancy of Water	0.0 kips
Total	559.6 kips

Overturning Resistance:

Overturning Moment (M_u)	4881.5 ft-kips	4550 ft-kips + (51 kips x 6.5 ft)
Resisting Moment (R_s)	6994.6875 ft-kips	559.575 kips x 25 ft / 2
ϕ x R_s > M_u	$M_{overturning}$ / f M_{resist}	**93.1%** **OK**

Soil Bearing Pressure:

Eccentricity (e)	8.72 ft	4881.5 ft-kips / 559.575 kips
6(e)	52.3 ft >	25.0 ft 6e > 25
Maximum Soil Bearing	3818.2544 psf	Calculated across corners
Soil Overburden	-660 psf	
Net Soil Bearing	3158.2544 psf	
Resisting Soil Bearing (R_s)	6000 psf	
Net Soil Bearing < ϕ x R_s	Net Bearing / f R_s	**70.2%** **OK**

Bending Moment in Pier:

Bending Moment	4703 ft-kips	4550 ft-kips + (51 kips x 3 ft)
Pier Steel Req'd (Loads)	41.41 in^2	
Min. Pier Steel	35.28 in^2	1/2% (Based on Square Pier)

Bending Moment in Footing:

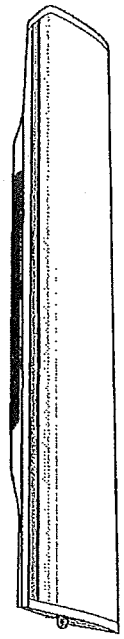
Max Bending Moment	2941.3521 ft-kips	Σ Moments about pier face
Footing Steel Req'd (Loads)	1.14 in^2/ft	
Min. Footing Steel	0.91 in^2/ft	0.18%

ERICSSON

Antenna Integrated Radio Unit Description

AIR

DESCRIPTION



101/1551-LZA 701 6001 Uen V

Table 5 . AIR Unit Typical Antenna Performance Data

AIR Unit Type	Active Antenna				Passive Antenna			
	Gain (dBi)	Horizontal Half-Power Beam Width (deg)	Vertical Half-Power Beam width (deg)	Electrical Tilt (deg)	Gain (dBi)	Horizontal Half-Power Beam Width (deg)	Vertical Half-Power Beam Width (deg)	Electrical Tilt (deg)
AIR 21 B2A B4P	18	63	7	2—12	18	63	7	2—12
AIR 21 B2A B12P B8P	18	63	6	2.5—12	16	65	10	2—12
AI R21 B3A B1P	17	68	7	2—12	18	63	7	2—12
AIR 21 B3A B12P B8P	17	67	6	2.5—12	16	64	8	1.5—10
AIR 21 B4A B2P	18	65	7	2—12	18	65	7	2—12
AIR 21 B4A B12P B5P	18	61	7	2—12	16	68	9	2—10
AIR 21 B4A B12P B8P (1.3 m AIR unit)	17	64	7	2.5—12	14	68	16	2—16
AIR 21 B4A B12P B8P (2.0 m AIR unit)	18	63	7	2.5—12	16	66	10	2—12
AIR 21 B7A 2P	18	60	6	2—14	17	63	6	2—14

3.3 Physical Characteristics

This section describes the physical dimensions, weight, and color of the AIR unit.

The dimensions of the AIR unit are shown in Figure 7 and listed in Table 6.

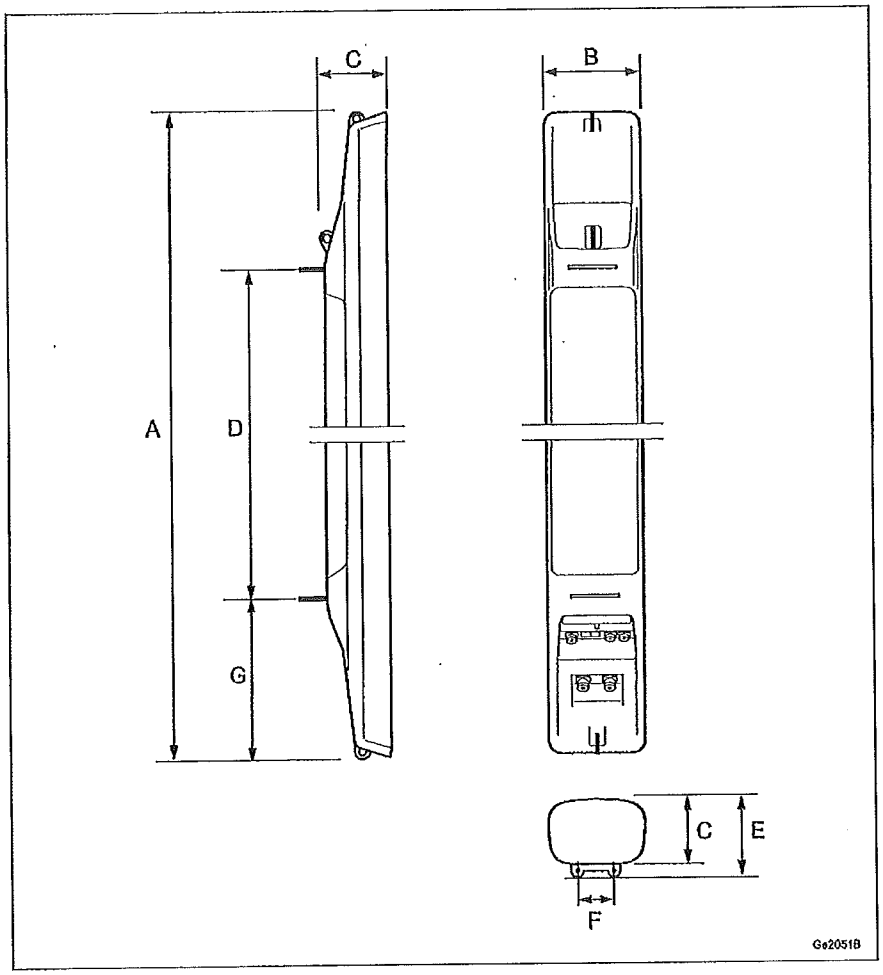


Figure 7 AIR Unit Dimensions

Table 6 AIR Unit Dimensions

AIR Unit Type	Height (A)	Width (B)	Depth (C)	Distance between mounting brackets (D)	Depth including mounting brackets (E)	Distance between stud holes on mounting brackets (F)	Distance between lower mounting bracket and the lower end of the AIR unit (G)
AIR 11 B8A B20P	1982 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	484 mm
AIR 11 B20A B8P (1.3 m AIR unit)	1427 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm
AIR 11 B20A B8P (2.0 m AIR unit)	1982 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	484 mm

AIR Unit Type	Height (A)	Width (B)	Depth (C)	Distance between mounting brackets (D)	Depth including mounting brackets (E)	Distance between stud holes on mounting brackets (F)	Distance between lower mounting bracket and the lower end of the AIR unit (G)
AIR 21 B1A B3P	1427 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm
AIR 21 B1A B12P B8P (2.0 m AIR unit)	1991 mm	378 mm	240 mm	1017 mm	281 mm	110 mm	484 mm
AIR 21 B2A B4P	1427 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm
AIR 21 B2A B12P B8P (2.0 m AIR unit)	1991 mm	378 mm	240 mm	1017 mm	281 mm	110 mm	484 mm
AIR 21 B3A B1P	1427 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm
AIR 21 B3A B12P B8P (2.4 m AIR unit)	2430 mm	378 mm	240 mm	1017 mm	281 mm	110 mm	708 mm
AIR 21 B4A B2P	1427 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm
AIR 21 B4A B12P B5P (2.4 m AIR unit)	2432 mm	307 mm	222 mm	1017 mm	263 mm	110 mm	708 mm
AIR 21 B4A B12P B8P (1.3 m AIR unit)	1448 mm	378 mm	240 mm	1017 mm	281 mm	110 mm	243 mm
AIR 21 B4A B12P B8P (2.0 m AIR unit)	1991 mm	378 mm	240 mm	1017 mm	281 mm	110 mm	484 mm
AIR 21 B7A 2P	1429 mm	307 mm	200 mm	1017 mm	241 mm	110 mm	243 mm

Table 7 lists the weight of the AIR unit with and without installation kit.

Table 7 AIR Unit Weight with and without Installation Kit

AIR Unit Type	Weight without Installation Kit	Weight with Single Unit Pole Installation Kit, 55-115 mm	Weight with Single Unit Pole Installation Kit, 110-220 mm	Weight with Single Unit Wall Installation Kit	Weight with Triple Unit Pole Installation Kit, 114.3 mm (1)	Weight with Triple Unit Pole Installation Kit, 139.7 mm (1)	Weight with Down Tilt Installation Kit and Single Unit Pole Clamp, 110-220 mm	Weight with AIR Heavy Down Tilt Installation Kit, 55-115 mm
AIR 11 B8A B20P	39.5 kg	43.9 kg	47.2 kg	42.8 kg	49.7 kg	49.7 kg	N/A (2)	49.4 kg
AIR 11 B20A B8P (1.3 m AIR unit)	37.2 kg	41.6 kg	44.9 kg	40.5 kg	47.4 kg	47.4 kg	51.8 kg	47.1 kg
AIR 11 B20A B8P (2.0 m AIR unit)	39.5 kg	43.9 kg	47.2 kg	42.8 kg	49.7 kg	49.7 kg	N/A (2)	49.4 kg
AIR 21 B1A B3P	41.0 kg	45.4 kg	48.7 kg	44.3 kg	51.2 kg	51.2 kg	55.6 kg	50.9 kg

AIR Unit Type	Weight without Installation Kit	Weight with Single Unit Pole Installation Kit, 55-115 mm	Weight with Single Unit Pole Installation Kit, 110-220 mm	Weight with Single Unit Wall Installation Kit	Weight with Triple Unit Pole Installation Kit, 114.3 mm (1)	Weight with Triple Unit Pole Installation Kit, 139.7 mm (1)	Weight with Down Tilt Installation Kit and Single Unit Pole Clamp, 110-220 mm	Weight with AIR Heavy Down Tilt Installation Kit, 55-115 mm
AIR 21 B1A B12P B8P	61.0 kg	65.4 kg	68.7 kg	64.3 kg	71.2 kg	71.2 kg	75.6 kg	70.9 kg
AIR 21 B2A B4P	41.5 kg	45.9 kg	49.2 kg	44.8 kg	51.7 kg	51.7 kg	56.1 kg	51.4 kg
AIR 21 B2A B12P B8P	61.0 kg	65.4 kg	68.7 kg	64.3 kg	71.2 kg	71.2 kg	75.6 kg	70.9 kg
AIR 21 B3A B1P	41.0 kg	45.4 kg	48.7 kg	44.3 kg	51.2 kg	51.2 kg	55.6 kg	50.9 kg
AIR 21 B3A B12P B8P	66.5 kg	70.9 kg	74.2 kg	N/A (2)	76.7 kg	76.7 kg	N/A (2)	76.4 kg
AIR 21 B4A B2P	41.0 kg	45.4 kg	48.7 kg	44.3 kg	51.2 kg	51.2 kg	55.6 kg	50.9 kg
AIR 21 B4A B12P B5P	57.0 kg	61.4 kg	64.7 kg	60.3 kg	67.2 kg	67.2 kg	N/A (2)	66.9 kg
AIR 21 B4A B12P B8P (1.3 m AIR unit)	51.0 kg	55.4 kg	58.7 kg	54.3 kg	61.2 kg	61.2 kg	65.6 kg	60.9 kg
AIR 21 B4A B12P B8P (2.0 m AIR unit)	61.0 kg	65.4 kg	68.7 kg	64.3 kg	71.2 kg	71.2 kg	75.6 kg	70.9 kg
AIR 21 B7A 2P	44.3 kg	48.7 kg	52.0 kg	47.6 kg	54.5 kg	54.5 kg	58.9 kg	54.2 kg

(1) Weight includes one AIR unit and the triple unit pole installation kit. After hoisting and installing, two more AIR units can be installed on the triple unit pole installation kit.
(2) Not Applicable.

The color of the radome is gray, and light grey on the rear and side solar shields.

3.4 Space Requirements

This section describes the space requirements for installing the AIR unit. A complete installation description is found in *Installing Antenna Integrated Radio Units.*

The AIR unit is only for outdoor installation. Pole installations can be either on monopoles or masts (or towers).

3.4.1 Generic Requirements

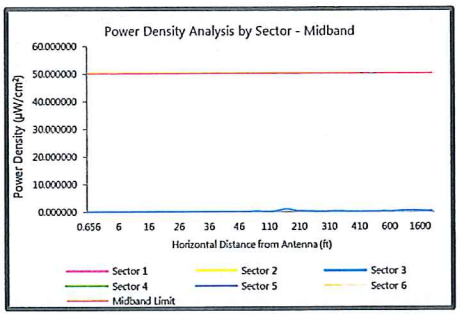
The AIR unit is installed with the cable connections facing down. Allow a minimum of 500 mm free space below the AIR unit to ensure sufficient working space. If there is a heat generating unit placed below the AIR unit, the distance to the AIR unit must be a minimum of 1 m to ensure adequate airflow.

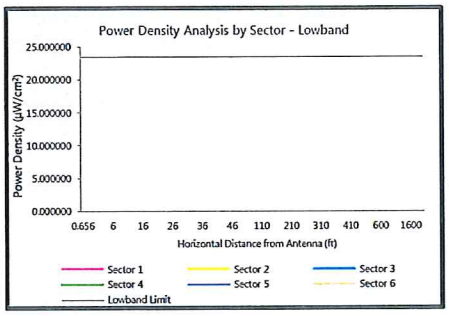
T··Mobile·

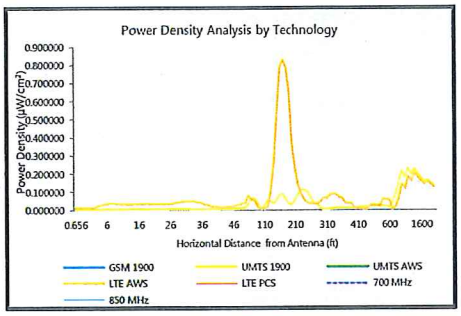
MAXIMUM PERMISSIBLE EMISSION (MPE) ANALYSIS REPORT

Report Date: 27-Mar-15

REGION :	South	MARKET :	CAROLINA	SITE ID :	5RA0532D	SITE TYPE :	Pole	COLOCATED :	No







Distance (ft)	Midband Frequencies - Calculated Power Density (µW/cm²)						Lowband Frequencies - Calculated Power Density (µW/cm²)						Midband Limit	Lowband Limit
	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6		
0.656	0.008951	0.008951	0.008951										50	23.5
0.6561	0.008951	0.008951	0.008951										50	23.5
0.7	0.008951	0.008951	0.008951										50	23.5
0.8	0.008951	0.008951	0.008951										50	23.5
0.9	0.008951	0.008951	0.008951										50	23.5
1	0.008951	0.008951	0.008951										50	23.5
2	0.008949	0.008949	0.008949										50	23.5
3	0.019333	0.019333	0.019333										50	23.5
4	0.019324	0.019324	0.019324										50	23.5
5	0.028656	0.028656	0.028656										50	23.5
6	0.028634	0.028634	0.028634										50	23.5
7	0.032262	0.032262	0.032262										50	23.5
8	0.032228	0.032228	0.032228										50	23.5
9	0.030590	0.030590	0.030590										50	23.5
10	0.030550	0.030550	0.030550										50	23.5
11	0.028079	0.028079	0.028079										50	23.5
12	0.028035	0.028035	0.028035										50	23.5
13	0.028201	0.028201	0.028201										50	23.5
14	0.028149	0.028149	0.028149										50	23.5
15	0.030533	0.030533	0.030533										50	23.5
16	0.030468	0.030468	0.030468										50	23.5
17	0.032359	0.032359	0.032359										50	23.5
18	0.032282	0.032282	0.032282										50	23.5
19	0.032201	0.032201	0.032201										50	23.5
20	0.032076	0.032076	0.032076										50	23.5
21	0.031987	0.031987	0.031987										50	23.5
22	0.030870	0.030870	0.030870										50	23.5
23	0.030777	0.030777	0.030777										50	23.5
24	0.030915	0.030915	0.030915										50	23.5
25	0.030815	0.030815	0.030815										50	23.5
26	0.033897	0.033897	0.033897										50	23.5
27	0.033778	0.033778	0.033778										50	23.5
28	0.039771	0.039771	0.039771										50	23.5
29	0.039622	0.039622	0.039622										50	23.5
30	0.045418	0.045418	0.045418										50	23.5
31	0.045238	0.045238	0.045238										50	23.5
32	0.045053	0.045053	0.045053										50	23.5
33	0.045970	0.045970	0.045970										50	23.5
34	0.045772	0.045772	0.045772										50	23.5
35	0.039011	0.039011	0.039011										50	23.5
36	0.038834	0.038834	0.038834										50	23.5
37	0.027228	0.027228	0.027228										50	23.5
38	0.027099	0.027099	0.027099										50	23.5
39	0.017227	0.017227	0.017227										50	23.5
40	0.017142	0.017142	0.017142										50	23.5
41	0.017056	0.017056	0.017056										50	23.5
42	0.014356	0.014356	0.014356										50	23.5
43	0.014281	0.014281	0.014281										50	23.5
44	0.019210	0.019210	0.019210										50	23.5
45	0.019106	0.019106	0.019106										50	23.5
46	0.019001	0.019001	0.019001										50	23.5
47	0.028585	0.028585	0.028585										50	23.5
48	0.028422	0.028422	0.028422										50	23.5
49	0.040246	0.040246	0.040246										50	23.5
50	0.040011	0.040011	0.040011										50	23.5
60	0.100828	0.100828	0.100828										50	23.5
70	0.110135	0.110135	0.110135										50	23.5
80	0.109120	0.109120	0.109120										50	23.5
90	0.042980	0.042980	0.042980										50	23.5
100	0.010380	0.010380	0.010380										50	23.5
110	0.024803	0.024803	0.024803										50	23.5
120	0.060465	0.060465	0.060465										50	23.5
130	0.140387	0.140387	0.140387										50	23.5
140	0.290991	0.290991	0.290991										50	23.5
150	0.573624	0.573624	0.573624										50	23.5
160	0.864358	0.864358	0.864358										50	23.5
170	0.905358	0.905358	0.905358										50	23.5
180	0.842397	0.842397	0.842397										50	23.5
190	0.687374	0.687374	0.687374										50	23.5
200	0.394029	0.394029	0.394029										50	23.5

Distance (ft)	Midband Frequencies - Calculated Power Density (μW/cm²)						Lowband Frequencies - Calculated Power Density (μW/cm²)						Midband Limit	Lowband Limit
	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6		
210	0.279853	0.279853	0.279853										50	23.5
220	0.215814	0.215814	0.215814										50	23.5
230	0.184506	0.184506	0.184506										50	23.5
240	0.161328	0.161328	0.161328										50	23.5
250	0.130301	0.130301	0.130301										50	23.5
260	0.093234	0.093234	0.093234										50	23.5
270	0.063617	0.063617	0.063617										50	23.5
280	0.059846	0.059846	0.059846										50	23.5
290	0.051911	0.051911	0.051911										50	23.5
300	0.065569	0.065569	0.065569										50	23.5
310	0.061950	0.061950	0.061950										50	23.5
320	0.083097	0.083097	0.083097										50	23.5
330	0.093682	0.093682	0.093682										50	23.5
340	0.088854	0.088854	0.088854										50	23.5
350	0.076495	0.076495	0.076495										50	23.5
360	0.072723	0.072723	0.072723										50	23.5
370	0.044128	0.044128	0.044128										50	23.5
380	0.042044	0.042044	0.042044										50	23.5
390	0.040100	0.040100	0.040100										50	23.5
400	0.016649	0.016649	0.016649										50	23.5
410	0.015910	0.015910	0.015910										50	23.5
420	0.016020	0.016020	0.016020										50	23.5
430	0.015337	0.015337	0.015337										50	23.5
440	0.014695	0.014695	0.014695										50	23.5
450	0.042038	0.042038	0.042038										50	23.5
460	0.040345	0.040345	0.040345										50	23.5
470	0.038751	0.038751	0.038751										50	23.5
480	0.037247	0.037247	0.037247										50	23.5
490	0.072900	0.072900	0.072900										50	23.5
500	0.070171	0.070171	0.070171										50	23.5
600	0.060029	0.060029	0.060029										50	23.5
700	0.036761	0.036761	0.036761										50	23.5
800	0.094201	0.094201	0.094201										50	23.5
900	0.207009	0.207009	0.207009										50	23.5
1000	0.348974	0.348974	0.348974										50	23.5
1100	0.289121	0.289121	0.289121										50	23.5
1200	0.406245	0.406245	0.406245										50	23.5
1300	0.346658	0.346658	0.346658										50	23.5
1400	0.420781	0.420781	0.420781										50	23.5
1500	0.366892	0.366892	0.366892										50	23.5
1600	0.322712	0.322712	0.322712										50	23.5
1700	0.286045	0.286045	0.286045										50	23.5
1800	0.310854	0.310854	0.310854										50	23.5
1900	0.279120	0.279120	0.279120										50	23.5
2000	0.252004	0.252004	0.252004										50	23.5

MPE ANALYSIS RESULTS		Midband Frequencies						Lowband Frequencies				Max. power density dist. (ft)		Pass or Fail
SECTOR	TECH	RAD CENTER (ft)	TOTAL PCS EIRP (W)	TOTAL AWS EIRP (W)	CATEGORICAL EXCLUSION RESULT	MAX POWER DENSITY (μW/cm²)	NEXT STEPS	TOTAL 700 MHz EIRP (W)	TOTAL 850 MHz EIRP (W)	MAX POWER DENSITY (μW/cm²)	NEXT STEPS	Midband	Lowband	
1	U19,L21	120.00	2,495	2,438	Not Categorically Excluded	0.91	No further action needed			-	No further action needed	170	N/A	PASS
2	U19,L21	120.00	2,495	2,438	Not Categorically Excluded	0.91	No further action needed			-	No further action needed	170	N/A	PASS
3	U19,L21	120.00	2,495	2,438	Not Categorically Excluded	0.91	No further action needed			-	No further action needed	170	N/A	PASS

MPE SUMMARY REPORT

MPE RESULT : The site PASSED on the power density modelling.

NEXT STEP : Generate and save the MPE site report (PDF format) and no further action needed.

SIGN REQUIREMENTS (Note: The sign requirements below are from the result of the MPE analysis. Ability of an individual to come near the antenna can result in requiring signs also)

None required

None required

None required

NSD RFDS Preliminary v2.0

T Mobile

Site ID	5RA0532D	Latitude	35.990786	
		Longitude	-78.995143	
Site Name	5RA0532D	Site Type	Collocation	
Address		Site Class		
Market	Carolinas	Landlord	Bergman	

Configuration
1D

Approvals	
Market RF	Gurpreet Singh
Market Development	

RFDS Revision	2
RFDS Final	1D

Date 11/14/2014

Work Order #	

NOC# (888) 218-6664

Site Information

Existing Configuration 1	2	3	4		Proposed Configuration 1	2	3	4
				Cabinet #	1			
				Technology	UMTS/LTE			
				Cabinet type	6201			
				CBU				
				DUW30	1			
				DUL20	1			
				DUG20				
				DUS41				
				RBS6601				
				dTRU/TRX				
				RU22 B4				
				RUS01 B2	3			
				RUS01 B4				

	Relocate cabinet
X	Add cabinet
	Swap cabinet
	Remove cabinet
	Make cabinet dark

Scope of Work

Add one 6201 Site Cabinet
Install HCS, Install DUW30 and DUL20 .

ALPHA - Scope of Work

x	Add new mount	x	Add RRU
	Relocate antenna		Swap existing RRU
x	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna	x	Add coax cables
	Add TMA	x	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

BETA - Scope of Work

x	Add new mount	x	Add RRU
	Relocate antenna		Swap existing RRU
x	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna	x	Add coax cables
	Add TMA	x	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

GAMMA - Scope of Work

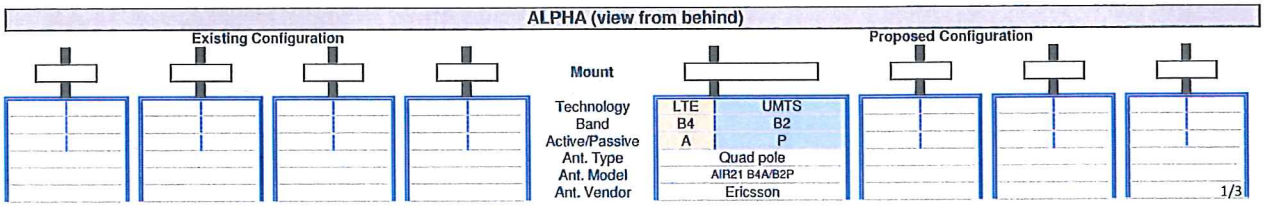
x	Add new mount	x	Add RRU
	Relocate antenna		Swap existing RRU
x	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna	x	Add coax cables
	Add TMA	x	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

DELTA - Scope of Work

	Add new mount		Add RRU
	Relocate antenna		Swap existing RRU
	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna		Add coax cables
	Add TMA		Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

ALPHA (view from behind)



NSD RFDS Preliminary v2.0

T-Mobile

Site ID	5RA0532D	Latitude	35.990786
		Longitude	-78.995143
Site Name	5RA0532D	Site Type	Collocation
Address		Site Class	
Market	Carolinas	Landlord	Bergman

Configuration
1D

Approvals	
Market RF	Gurpreet Singh
Market Development	

RFDS Revision	2
RFDS Final	1D

Date 11/14/2014

Ant. Height	120	
Azimuth	80	
RET deployed	Yes	Yes
E-Tilt	2	2
M-Tilt	0	0
TMA #		
TMA Type		
RRU #		1
RRU Type		S11 B2
Used Coax #		
Coax Type		
Coax Length (ft)		
Fiber (CPRI) #	2	2
Splitter #		
Combiner #		
Combiner Type		

X	Add new mount	X	Add RRU
	Relocate antenna		Swap existing RRU
X	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna		Add coax cables
	Add TMA	X	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Scope of work

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

BETA (view from behind)

Existing Configuration | Proposed Configuration

Technology	LTE	UMTS
Band	B4	B2
Active/Passive	A	P
Ant. Type	Quad pole	
Ant. Model	AIR21 B4A/B2P	
Ant. Vendor	Ericsson	
Ant. Height	120	
Azimuth	190	
RET deployed	Yes	Yes
E-Tilt	2	2
M-Tilt	0	0
TMA #		
TMA Type		
RRU #		1
RRU Type		S11 B2
Used Coax #		
Coax Type		
Coax Length (ft)		
Fiber (CPRI) #	2	2
Splitter #		
Combiner #		
Combiner Type		

X	Add new mount	X	Add RRU
	Relocate antenna		Swap existing RRU
X	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna		Add coax cables
	Add TMA	X	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Scope of work

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

GAMMA (view from behind)

Existing Configuration | Proposed Configuration

Technology	LTE	UMTS
Band	B4	B2
Active/Passive	A	P
Ant. Type	Quad pole	
Ant. Model	AIR21 B4A/B2P	
Ant. Vendor	Ericsson	
Ant. Height	120	
Azimuth	290	
RET deployed	Yes	Yes
E-Tilt	2	2
M-Tilt	0	0
TMA #		
TMA Type		

NSD RFDS Preliminary v2.0

T-Mobile

Site ID	5RA0532D	Latitude	35.990786
		Longitude	-78.995143
Site Name	5RA0532D	Site Type	Collocation
Address		Site Class	
Market	Carolinas	Landlord	Bergman

Configuration
1D

Approvals	
Market RF	Gurpreet Singh
Market Development	

RFDS Revision	2
RFDS Final	1D

Date 11/14/2014

RRU #					1				
RRU Type					S11 B2				
Used Coax #									
Coax Type									
Coax Length (ft)									
Fiber (CPRI) #				2	2				
Splitter #									
Combiner #									
Combiner Type									

X	Add new mount	x	Add RRU
	Relocate antenna		Swap existing RRU
x	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna		Add coax cables
	Add TMA	x	Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Scope of work

Install 1x AIR21 B4A B2P .Install 2 Large COVP(one bottom and one at top). Install RRUS11 B2 at U1900 with RF jumpers.
Install Fiber optic 9x18 and pigtails to RRU

DELTA (view from behind)

	Existing Configuration				Proposed Configuration			
Technology								
Band								
Active/Passive								
Ant. Type								
Ant. Model								
Ant. Vendor								
Ant. Height								
Azimuth								
RET deployed								
E-Tilt								
M-Tilt								
TMA #								
TMA Type								
RRU #								
RRU Type								
Used Coax #								
Coax Type								
Coax Length (ft)								
Fiber (CPRI) #								
Splitter #								
Combiner #								
Combiner Type								

	Add new mount		Add RRU
	Relocate antenna		Swap existing RRU
	Add antenna		Remove RRU
	Swap antenna		Consolidate coax cables
	Remove antenna		Add coax cables
	Add TMA		Add fiber cables
	Swap TMA		Add hybrid combiner
	Remove TMA		Add filter combiner

Scope of work

See Tabs 11-15

T-Mobile
12920 SE 38th Street
Bellevue, WA 98006

DATE: March 27, 2015
SUBJECT: FCC Compliance Assessment for Proposed **T-Mobile Site 5RA0532D**

T-Mobile South, LLC has been requested to evaluate the radio frequency emissions of our proposed site 5RA0532D. In addition, T-Mobile South, LLC has been requested to address other RF related topics such as transmitter operation and maximum permissible output power levels. The remainder of this report will address all RF related items requested by Durham County Zoning/Planning for proposed site 5RA0532D.

Transmitter Operation

T-Mobile owns the AWS E & F LTE Bands and A3 & A4 PCS Band licenses in Durham County. The transmitters being used on the proposed site are authorized to operate in the 2140-2155 and 1930-1940 Megahertz (MHz) frequency range. The Ericsson Node B base station transmitters T-Mobile utilizes have a maximum output level of 80 watts. T-Mobile utilizes the GSM, LTE and UMTS digital technology. As a result our transmitters utilize Gaussian Minimum Shift Keying (GMSK), 16-State Quadrature Amplitude (16QAM), 64-State Quadrature Amplitude (64 QAM) and Quadrature Phase Shift Keying (QPSK) modulation. Precision filters limit unwanted and spurious emissions to levels below the FCC specification. The signals being transmitted will not interfere with the operation of commercial radio, cellular radio, television, telephone or other FCC approved communication equipment. For our proposed site 5RA0532D, GSM technology will not be deployed.

Maximum Permissible Output Power

The maximum permissible output power for 1900 band per sector is 1640 Watts of effective radiated power (ERP) from the antennas in Durham County. The proposed site 5RA0532D is only transmitting 196 total watts ERP.

The maximum permissible output power for 2100 band per sector is 1640 Watts of effective radiated power (ERP) from the antennas in Durham County. The proposed site 5RA0532D is only transmitting 196 total watts ERP.

RF Exposure (NIER levels)

The FCC states in 47 CFR 1.1310 that the maximum permissible exposure (MPE) level from nonionizing electromagnetic radiation (NIER) to the general population at cellular and PCS frequencies is 1.0 milliwatt per centimeter squared (mW/cm^2). MPE is a measure of the RF power density at or below which there are no potential harmful effects from the exposure.

Power density calculations are based on guidelines given by the ANSI Standard C95.1-1992 and are based on a worst case scenario. For analysis purposes, worst case conditions were chosen for all output power levels based on the deployment of LTE and UMTS technologies. The site is being deployed

initially with 3 transmitters. For analysis purposes, 3 transmitters were used. A summary of the results of the power density calculations for site 5RA0532D is listed below in Table 1 and Table 2.

Distance From Tower (Feet)	Power Density (mw/cm2)	%FCC Standard
1	0.000008951	0.0008951
25	0.000030815	0.0030815
50	0.000040011	0.0040011
75	0.000109120	0.0109120
100	0.000010380	0.0010380

Table 1: Power Density Summary for Site 5RA0532D for 1900 Band

Distance From Tower (Feet)	Power Density (mw/cm2)	%FCC Standard
1	0.000008951	0.0008951
25	0.000030815	0.0030815
50	0.000040011	0.0040011
75	0.000109120	0.0109120
100	0.000010380	0.0010380

Table 2: Power Density Summary for Site 5RA0532D for 2100 Band

As shown in Table 1, the maximum power density will not exceed 0.000109120 mw/cm2 at ground level in 1900 Band and as shown in Table 2, the maximum power density will not exceed 0.000109120 mw/cm2 at ground level in 2100 Band. Moreover, the average energy expected near ground level is less than 1% of the MPE level. This level does not exceed the MPE limit set by the Federal Communications Commission or the American National Standards Institute.

Based upon the ANSI/FCC standard and the predicted levels of electromagnetic energy emitted by site 5RA0532D, this installation will be of no safety concern to the general public.

Sincerely,

Chris Gunter

Manager, Engineering - RF Deployment
T··Mobile·
2105 Water Ridge Parkway, Suite 400 Charlotte, NC 28217

SKYWAY TOWERS

To: Orange County Planning Department
131 West Margaret Lane
P.O. Box 8181
Hillsborough, NC 27278

Affidavit in Support of Application of Skyway Towers, LLC for issuance of a Special Use Permit to construct a new Wireless Telecommunications Tower on the following site:

Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

SKYWAY TOWERS, LLC

Skyway Towers, LLC ("Skyway") is one of the leading independent owners and operators of shared wireless infrastructure. The core business of Skyway involves the engineering, deployment, marketing, ownership, operation and leasing of shared wireless communications sites. The undersigned, as the Project Manager for Skyway Towers, LLC, does hereby affirm and certify as follows:

Section 5.10.8 A(1)(r) Certification

The antenna(s) for the proposed telecommunication support structure for which the Special Use Permit is being requested will not cause interference with other telecommunication devices and will be operated in compliance with all FCC rules and regulations.

Skyway Towers, LLC

By: _____

Name: Justin Jones

Title: Project Manager

20525 Amberfield Drive • Suite 102 • Land O Lakes, FL 34638
Phone: 813-960-6200 • Fax: 813-960-6210 • www.skywaytowers.com

T-Mobile
12920 SE 38th Street
Bellevue, WA 98006

Re: Proposed Telecommunications Tower
5022 Kerley Road
Durham, NC 27705

RF ENGINEERING STATEMENT

Site Justification-5RA0532D

T-Mobile is seeking to improve its telecommunications coverage in Orange and Durham counties. Specifically, T-Mobile is seeking to improve coverage in the residential and commercial areas in the vicinity of the proposed site. In those areas, the coverage is currently spotty and scattered. T-Mobile's goal is to obtain a level of coverage of -84 dBm in this area. There is a great demand for service in this area, and T-Mobile's level of service in this area does not reach the level of coverage of -84 dBm. Once the site has been constructed that level of coverage will be provided.

The proposed telecommunications support structure is a 125-foot monopole with a 4-foot lightning rod that will accommodate T-Mobile's flush-mounted antennas. The proposed monopole is required so that T-Mobile may provide telecommunications coverage to mobile traffic, residences, and businesses in the area of Erwin Road and Mount Sinai Road. The proposed site will also provide coverage to residents living around and near the new site.

Sincerely,

Chris Gunter

Manager, Engineering - RF Deployment

Chris Gunter

ULS License

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGB375 - T-Mobile License LLC

Call Sign	WQGB375	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Status	Active	Auth Type	Regular

Market

Market	REA002 - Southeast	Channel Block	E
Submarket	1	Associated Frequencies (MHz)	001740.00000000-001745.00000000 002140.00000000-002145.00000000

Dates

Grant	11/29/2006	Expiration	11/29/2021
Effective	08/23/2012	Cancellation	

Buildout Deadlines

1st 2nd

Notification Dates

1st 2nd

Licensee

FRN	0001565449	Type	Limited Liability Company

Licensee

T-Mobile License LLC
12920 SE 38th St.
Bellevue, WA 98006
ATTN Dan Menser

P:(425)383-4000
F:(425)378-4040
E:FCCRegulatoryComplianceContact@t-mobile.com

Contact

T-Mobile License LLC
Kathleen O Ham
12920 SE 38th St.
Bellevue, WA 98006
ATTN Dan Menser

P:(425)383-4000
F:(202)654-5963
E:FCCRegulatoryComplianceContact@t-mobile.com

Ownership and Qualifications

Radio Service Type	Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership

Is the applicant a foreign government or the representative of any foreign government?	No
Is the applicant an alien or the representative of an alien?	No
Is the applicant a corporation organized under the laws of any foreign government?	No
Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	No
Is the applicant directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof, or by any corporation organized under the laws of a foreign country?	**Yes**

The Alien Ruling question is not answered.

Basic Qualifications
The Applicant answered "No" to each of the Basic Qualification questions.

Tribal Land Bidding Credits
This license did not have tribal land bidding credits.

Demographics

Race

Ethnicity

Gender

Universal Licensing System

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGB375 - T-Mobile License LLC

HELP

Market

Call Sign	WQGB375	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Market	REA002 - Southeast	Channel Block	E
Submarket	1	Associated Frequencies (MHz)	001740.00000000-001745.00000000 002140.00000000-002145.00000000
Auction	66 - AWS-1		

Define View: Spectrum and Market Areas GO

All Results Displayed

Spectrum & Market Area (MHz) **001740.00000000-001745.00000000**
002140.00000000-002145.00000000

Market Areas		Type	Code	Population†
Washington		MEA	005	
47 of 64 Counties				
1	SUSSEX, DE	County	10005	197145
2	ALLEGANY, MD	County	24001	75087
3	ANNE ARUNDEL, MD	County	24003	537656
4	BALTIMORE, MD	County	24005	805029
5	CALVERT, MD	County	24009	88737
6	CAROLINE, MD	County	24011	33066
7	CARROLL, MD	County	24013	167134
8	DORCHESTER, MD	County	24019	32618
9	FREDERICK, MD	County	24021	233385
10	GARRETT, MD	County	24023	30097
11	HARFORD, MD	County	24025	244826
12	HOWARD, MD	County	24027	287085
13	KENT, MD	County	24029	20197
14	QUEEN ANNE`S, MD	County	24035	47798
15	ST. MARY`S, MD	County	24037	105151
16	SOMERSET, MD	County	24039	26470
17	TALBOT, MD	County	24041	37782
18	WASHINGTON, MD	County	24043	147430
19	WICOMICO, MD	County	24045	98733

20	WORCESTER, MD	County	24047	51454
21	ACCOMACK, VA	County	51001	33164
22	CAROLINE, VA	County	51033	28545
23	CLARKE, VA	County	51043	14034
24	CULPEPER, VA	County	51047	46689
25	FAUQUIER, VA	County	51061	65203
26	FREDERICK, VA	County	51069	78305
27	KING GEORGE, VA	County	51099	23584
28	MADISON, VA	County	51113	13308
29	NORTHAMPTON, VA	County	51131	12389
30	ORANGE, VA	County	51137	33481
31	PAGE, VA	County	51139	24042
32	RAPPAHANNOCK, VA	County	51157	7373
33	SHENANDOAH, VA	County	51171	41993
34	SPOTSYLVANIA, VA	County	51177	122397
35	STAFFORD, VA	County	51179	128961
36	WARREN, VA	County	51187	37575
37	WESTMORELAND, VA	County	51193	17454
38	BERKELEY, WV	County	54003	104169
39	GRANT, WV	County	54023	11937
40	HAMPSHIRE, WV	County	54027	23964
41	HARDY, WV	County	54031	14025
42	JEFFERSON, WV	County	54037	53498
43	MINERAL, WV	County	54057	28212
44	MORGAN, WV	County	54065	17541
45	Baltimore City, MD	County	24510	620961
46	Fredericksburg City, VA	County	51630	24286
47	Winchester City, VA	County	51840	26203

Richmond MEA 006

101 of 104 Counties

1	ALLEGHANY, NC	County	37005	11155
2	BERTIE, NC	County	37015	21282
3	CAMDEN, NC	County	37029	9980
4	CHOWAN, NC	County	37041	14793
5	CURRITUCK, NC	County	37053	23547
6	GATES, NC	County	37073	12197
7	HERTFORD, NC	County	37091	24669
8	PASQUOTANK, NC	County	37139	40661
9	PERQUIMANS, NC	County	37143	13453
10	ALBEMARLE, VA	County	51003	98970
11	ALLEGHANY, VA	County	51005	12567
12	AMELIA, VA	County	51007	12690
13	AMHERST, VA	County	51009	32353
14	APPOMATTOX, VA	County	51011	14973
15	AUGUSTA, VA	County	51015	73750

16	BATH, VA	County	51017	4731
17	BEDFORD, VA	County	51019	68676
18	BOTETOURT, VA	County	51023	33148
19	BRUNSWICK, VA	County	51025	17434
20	BUCKINGHAM, VA	County	51029	17146
21	CAMPBELL, VA	County	51031	54842
22	CARROLL, VA	County	51035	30042
23	CHARLES CITY, VA	County	51036	7256
24	CHARLOTTE, VA	County	51037	12586
25	CHESTERFIELD, VA	County	51041	316236
26	CRAIG, VA	County	51045	5190
27	CUMBERLAND, VA	County	51049	10052
28	DINWIDDIE, VA	County	51053	28001
29	ESSEX, VA	County	51057	11151
30	FLOYD, VA	County	51063	15279
31	FLUVANNA, VA	County	51065	25691
32	FRANKLIN, VA	County	51067	56159
33	GILES, VA	County	51071	17286
34	GLOUCESTER, VA	County	51073	36858
35	GOOCHLAND, VA	County	51075	21717
36	GRAYSON, VA	County	51077	15533
37	GREENE, VA	County	51079	18403
38	GREENSVILLE, VA	County	51081	12243
39	HALIFAX, VA	County	51083	30246
40	HANOVER, VA	County	51085	99863
41	HENRICO, VA	County	51087	306935
42	HIGHLAND, VA	County	51091	2321
43	ISLE OF WIGHT, VA	County	51093	35270
44	JAMES CITY, VA	County	51095	67009
45	KING AND QUEEN, VA	County	51097	6945
46	KING WILLIAM, VA	County	51101	15935
47	LANCASTER, VA	County	51103	11391
48	LOUISA, VA	County	51109	33153
49	LUNENBURG, VA	County	51111	12914
50	MATHEWS, VA	County	51115	8978
51	MECKLENBURG, VA	County	51117	32727
52	MIDDLESEX, VA	County	51119	10959
53	MONTGOMERY, VA	County	51121	94392
54	NELSON, VA	County	51125	15020
55	NEW KENT, VA	County	51127	18429
56	NORTHUMBERLAND, VA	County	51133	12330
57	NOTTOWAY, VA	County	51135	15853
58	POWHATAN, VA	County	51145	28046
59	PRINCE EDWARD, VA	County	51147	23368
60	PRINCE GEORGE, VA	County	51149	35725

61	PULASKI, VA	County	51155	34872
62	RICHMOND, VA	County	51159	9254
63	ROANOKE, VA	County	51161	92376
64	ROCKBRIDGE, VA	County	51163	22307
65	ROCKINGHAM, VA	County	51165	76314
66	SOUTHAMPTON, VA	County	51175	18570
67	SURRY, VA	County	51181	7058
68	SUSSEX, VA	County	51183	12087
69	WYTHE, VA	County	51197	29235
70	YORK, VA	County	51199	65464
71	PENDLETON, WV	County	54071	7695
72	Bedford City, VA	County	51515	6222
73	Buena Vista City, VA	County	51530	6650
74	Charlottesville City, VA	County	51540	43475
75	Chesapeake City, VA	County	51550	222209
76	Clifton Forge City, VA	County	51560	3683
77	Colonial Heights City, VA	County	51570	17411
78	Covington City, VA	County	51580	5961
79	Emporia City, VA	County	51595	5927
80	Franklin City, VA	County	51620	8582
81	Galax City, VA	County	51640	7042
82	Hampton City, VA	County	51650	137436
83	Harrisonburg City VA	County	51660	48914
84	Hopewell City, VA	County	51670	22591
85	Lexington City, VA	County	51678	7042
86	Lynchburg City, VA	County	51680	75568
87	Newport News City, VA	County	51700	180719
88	Norfolk City, VA	County	51710	242803
89	Petersburg City, VA	County	51730	32420
90	Poquoson City, VA	County	51735	12150
91	Portsmouth City, VA	County	51740	95535
92	Radford City, VA	County	51750	16408
93	Richmond City, VA	County	51760	204214
94	Roanoke City, VA	County	51770	97032
95	Salem City, VA	County	51775	24802
96	South Boston City, VA	County	51780	5995
97	Staunton City, VA	County	51790	23746
98	Suffolk City, VA	County	51800	84585
99	Virginia Beach City, VA	County	51810	437994
100	Waynesboro City, VA	County	51820	21006
101	Williamsburgh City, VA	County	51830	14068
Charlotte-Greensboro-Greenvill All Counties (129)		MEA	007	13675352
		MEA	008	10815626

Atlanta All Counties (173)			
Jacksonville All Counties (45)	MEA	009	3018655
Tampa-St. Petersburg-Orlando All Counties (21)	MEA	010	8243006
Miami All Counties (12)	MEA	011	7232154

Refer to Auctions Cross References of market area types including MTA, BTA, counties, and more.

†: Population data is based on 2010 Census.

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Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Phone: 1-877-480-3201
TTY: 1-717-338-2824
Submit Help Request

ULS License

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGB375 - T-Mobile License LLC

Counties in Market Area

Call Sign	WQGB375	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Market	REA002 - Southeast	Channel Block	E
Submarket	1	Associated Frequencies (MHz)	001740.00000000-001745.00000000 002140.00000000-002145.00000000
Auction	66 - AWS-1		

Counties in MEA007 - Charlotte-Greensboro-Greenville-Raleigh

Return to Market Summary

County, State	FIPS Code	Population†
1 ALAMANCE, NC	37001	151131
2 ALEXANDER, NC	37003	37198
3 ANSON, NC	37007	26948
4 ASHE, NC	37009	27281
5 AVERY, NC	37011	17797
6 BEAUFORT, NC	37013	47759
7 BLADEN, NC	37017	35190
8 BRUNSWICK, NC	37019	107431
9 BUNCOMBE, NC	37021	238318
10 BURKE, NC	37023	90912
11 CABARRUS, NC	37025	178011
12 CALDWELL, NC	37027	83029
13 CARTERET, NC	37031	66469
14 CASWELL, NC	37033	23719
15 CATAWBA, NC	37035	154358
16 CHATHAM, NC	37037	63505
17 CLEVELAND, NC	37045	98078
18 COLUMBUS, NC	37047	58098
19 CRAVEN, NC	37049	103505
20 CUMBERLAND, NC	37051	319431
21 DARE, NC	37055	33920
22 DAVIDSON, NC	37057	162878
23 DAVIE, NC	37059	41240
24 DUPLIN, NC	37061	58505
25 DURHAM, NC	37063	267587
26 EDGECOMBE, NC	37065	56552
27 FORSYTH, NC	37067	350670

28	FRANKLIN, NC	37069	60619
29	GASTON, NC	37071	206086
30	GRANVILLE, NC	37077	59916
31	GREENE, NC	37079	21362
32	GUILFORD, NC	37081	488406
33	HALIFAX, NC	37083	54691
34	HARNETT, NC	37085	114678
35	HAYWOOD, NC	37087	59036
36	HENDERSON, NC	37089	106740
37	HOKE, NC	37093	46952
38	HYDE, NC	37095	5810
39	IREDELL, NC	37097	159437
40	JACKSON, NC	37099	40271
41	JOHNSTON, NC	37101	168878
42	JONES, NC	37103	10153
43	LEE, NC	37105	57866
44	LENOIR, NC	37107	59495
45	LINCOLN, NC	37109	78265
46	MCDOWELL, NC	37111	44996
47	MADISON, NC	37115	20764
48	MARTIN, NC	37117	24505
49	MECKLENBURG, NC	37119	919628
50	MITCHELL, NC	37121	15579
51	MONTGOMERY, NC	37123	27798
52	MOORE, NC	37125	88247
53	NASH, NC	37127	95840
54	NEW HANOVER, NC	37129	202667
55	NORTHAMPTON, NC	37131	22099
56	ONSLOW, NC	37133	177772
57	ORANGE, NC	37135	133801
58	PAMLICO, NC	37137	13144
59	PENDER, NC	37141	52217
60	PERSON, NC	37145	39464
61	PITT, NC	37147	168148
62	POLK, NC	37149	20510
63	RANDOLPH, NC	37151	141752
64	RICHMOND, NC	37153	46639
65	ROBESON, NC	37155	134168
66	ROCKINGHAM, NC	37157	93643
67	ROWAN, NC	37159	138428
68	RUTHERFORD, NC	37161	67810
69	SAMPSON, NC	37163	63431

70	SCOTLAND, NC	37165	36157
71	STANLY, NC	37167	60585
72	STOKES, NC	37169	47401
73	SURRY, NC	37171	73673
74	SWAIN, NC	37173	13981
75	TRANSYLVANIA, NC	37175	33090
76	TYRRELL, NC	37177	4407
77	UNION, NC	37179	201292
78	VANCE, NC	37181	45422
79	WAKE, NC	37183	900993
80	WARREN, NC	37185	20972
81	WASHINGTON, NC	37187	13228
82	WATAUGA, NC	37189	51079
83	WAYNE, NC	37191	122623
84	WILKES, NC	37193	69340
85	WILSON, NC	37195	81234
86	YADKIN, NC	37197	38406
87	YANCEY, NC	37199	17818
88	ABBEVILLE, SC	45001	25417
89	ANDERSON, SC	45007	187126
90	BERKELEY, SC	45015	177843
91	CALHOUN, SC	45017	15175
92	CHARLESTON, SC	45019	350209
93	CHEROKEE, SC	45021	55342
94	CHESTER, SC	45023	33140
95	CHESTERFIELD, SC	45025	46734
96	CLARENDON, SC	45027	34971
97	COLLETON, SC	45029	38892
98	DARLINGTON, SC	45031	68681
99	DILLON, SC	45033	32062
100	DORCHESTER, SC	45035	136555
101	FAIRFIELD, SC	45039	23956
102	FLORENCE, SC	45041	136885
103	GEORGETOWN, SC	45043	60158
104	GREENVILLE, SC	45045	451225
105	GREENWOOD, SC	45047	69661
106	HORRY, SC	45051	269291
107	KERSHAW, SC	45055	61697
108	LANCASTER, SC	45057	76652
109	LAURENS, SC	45059	66537
110	LEE, SC	45061	19220
111	LEXINGTON, SC	45063	262391

112	MCCORMICK, SC	45065	10233
113	MARION, SC	45067	33062
114	MARLBORO, SC	45069	28933
115	NEWBERRY, SC	45071	37508
116	OCONEE, SC	45073	74273
117	ORANGEBURG, SC	45075	92501
118	PICKENS, SC	45077	119224
119	RICHLAND, SC	45079	384504
120	SALUDA, SC	45081	19875
121	SPARTANBURG, SC	45083	284307
122	SUMTER, SC	45085	107456
123	UNION, SC	45087	28961
124	WILLIAMSBURG, SC	45089	34423
125	YORK, SC	45091	226073
126	JOHNSON, TN	47091	18244
127	HENRY, VA	51089	54151
128	PATRICK, VA	51141	18490
129	PITTSYLVANIA, VA	51143	63506
130	Danville City, VA	51590	43055
131	Martinsville City, VA	51690	13821

†: Population data is based on 2010 Census.

Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

Five to Ten Year Build Plan

T-Mobile's five to ten year build plan is to continue to add towers where coverage does not exist and to increase capacity where coverage does exist in response to customer demand.

Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

Statement Regarding Visual Intrusiveness for Surrounding Properties
Section 5.10.8(A)(1)(f)

The tower as proposed is a monopole tower with a slim profile. These types of towers are used throughout the area because of their slim profile and low visibility. As is shown by the photo simulations from the balloon test, the existing trees and terrain prevent the tower from being seen by many of the adjoining properties. References to views in this Statement are to the balloon test results.

With the trees that exist along the eastern property line, the neighbor to the east can barely see the tower as shown in the View from Location 12. While the properties to the north and at the intersection of Mt. Sinai and Kerley Roads can see the tower, the profile is very slim and consistent with the power poles and power lines that already exist. In addition, the landscaping required by the Orange County Tower Ordinance will require that the ground equipment be obscured from view by a fence and landscaping. As one moves along Mt. Sinai Road to the west, the tower quickly disappears behind the trees (View from Location 9). The same is true with respect to the houses to the south of the site (View from Location 2, 3, 4, 5 and 6). For the house immediately to the south, almost half of the tower is obscured by trees (Simulated View from Location 1).

Using a monopine at this location does not make sense because the tower itself is in an open field. As mentioned above, the existing trees and terrain do an excellent job of hiding the proposed tower. Furthermore, a monopine at this location will create a larger visual footprint than a monopole. Rather than just having the antennas attached to the tower, the branches of a monopine will make this tower appear much wider and larger causing it to stand out much more than a single, slim pole.

In connection with this Application, David A. Smith, MAI, SRA, a local appraiser, completed an Impact Analysis of the proposed tower on adjoining properties. This Impact Analysis is included with this Application. Mr. Smith did his analysis using Lake Hogan Farms, an Orange County subdivision which is adjoined by a lattice tower, which has a larger visual profile than the proposed tower (See Pictures included with Impact Analysis). Mr. Smith compared the change in value of the lots in Lake Hogan Farms that can see the tower to lots in Lake Hogan Farms that cannot see the tower and concluded that the tower had no impact on adjoining property values. In addition, he found that "the proposed tower will not adversely affect the property values of the properties that adjoin or abut the property." The Lake Hogan Farms tower is much more visible than the proposed tower. If the Lake Hogan Farms tower does not adversely impact property values than certainly, the slimmer profile of the proposed tower will not adversely impact property values, as concluded by Mr. Smith.

IMPACT ANALYSIS OF

A PROPOSED TELECOMMUNICATIONS TOWER ON THE VALUES OF SURROUNDING OR ADJOINING PROPERTIES

LOCATED ON

5022 KERLEY ROAD
ORANGE COUNTY, NORTH CAROLINA

AS OF

MARCH 31, 2015

FOR

THOMAS H. JOHNSON, JR.
NEXSEN PRUET, PLLC
4141 PARKLAKE AVENUE, SUITE 200
RALEIGH, NC 27612

BY

DAVID A SMITH, MAI, SRA
POST OFFICE BOX 51597
DURHAM, NORTH CAROLINA 27717-1597

PART ONE - INTRODUCTION

DAVID A. SMITH, MAI, SRA

P.O. BOX 51597
DURHAM, NORTH CAROLINA 27717-1597
PHONE (919) 493-1534
smithappraiser@verizon.net

April 9, 2015

Thomas H. Johnson, Jr.
Nexsen Pruet, PLLC
4141 Parklake Avenue, Suite 200
Raleigh, NC 27612

Mr. Johnson:

As requested, I have inspected the site of a proposed telecommunications tower and the surrounding and adjoining properties. The proposed tower will be located at 5022 Kerley Road in Orange County, North Carolina.

The purpose of this assignment is to develop an opinion of the effect of the proposed tower on the properties that adjoin or abut the proposed tower site. The intended use of this assignment is to assist the approving body in determining the effect of the proposed tower. The intended users of this report are officers and employees of Nexsen Pruet, PLLC and anyone they designate.

As requested, a summary report has been prepared. This is not an appraisal, but is a consulting assignment. This report assumes that the proposed tower has been constructed.

The properties were inspected on March 31, 2015 which is the effective date of this report and analysis. I made all necessary investigations and analyses. Based on a set of plans of the proposed tower, an inspection of the proposed tower and the surrounding and adjoining properties, an analysis of data gathered and facts and conclusions as contained in the following report of 17 pages, and subject to the assumptions and limiting conditions as stated, it is my opinion <u>that the proposed tower will not adversely affect the property values of the properties that adjoin or abut the property.</u>

I certify that I have personally inspected the site of the proposed tower and those properties that surround or adjoin it. I further certify that I have no interest either present or contemplated in the property and that neither the employment to make this analysis nor the compensation is contingent upon the result of the analysis.

Respectfully submitted,

David A. Smith

David A. Smith, MAI, SRA
NC State-Certified General Real Estate Appraiser #A281

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CERTIFICATION

I certify that, to the best of my knowledge and belief,...

The statements of fact contained in this report are true and correct.

The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.

I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.

I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.

My engagement in this assignment was not contingent upon developing or reporting predetermined results.

My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.

My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice.*

I have made a personal inspection of the property that is the subject of this report.

No one provided significant real property appraisal assistance to the person signing this certification.

The reported analysis, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and the Standards of Professional Appraisal Practice of the Appraisal Institute.

The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

As of the date of the report, I have completed the requirements of the continuing education program of the Appraisal Institute.

This assignment was not made, nor was the report rendered on the basis of a requested minimum valuation, specific valuation, or an amount, which would result in approval of a credit transaction.

Unless otherwise stated in this report, I have not performed any services regarding the subject property within the three year period immediately preceding acceptance of this assignment as an appraiser or in any other capacity.

I have not performed any service regarding this property for the prior three years.

David A. Smith

David A. Smith, MAI, SRA

PART TWO – PREMISES OF THE REPORT

STATEMENT OF COMPETENCE

I have completed all of the requirements to become a state certified general appraiser for the State of North Carolina and all of the requirements for the MAI designation. In addition I have successfully completed USPAP courses and continuing education seminars for over thirty years as well as preparing real estate appraisal reports over the same period. More detailed information about the courses and seminars are in the qualifications section of this report. I have prepared similar analyses and feel competent to perform this analysis.

EXTRAORDINARY ASSUMPTIONS AND HYPOTHETICAL CONDITIONS

An extraordinary assumption is an assumption, directly related to a specific assignment, which if found to be false, could alter the appraiser's opinions or conclusions. A hypothetical condition is something that is contrary to what exists but is supposed for the purpose of the analysis. This analysis assumes that the proposed tower has been constructed.

No other extraordinary assumptions or hypothetical conditions are made.

GENERAL ASSUMPTIONS AND LIMITING CONDITIONS

The report has been made with the following general assumptions:

1. Possession of this report, or a copy thereof, does not carry with it the right of publication.

2. The appraiser by reason of this report is not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.

3. Neither all nor any part of the contents of this report (especially any conclusions, the identity of the appraiser, or the firm with which the appraiser is connected) shall be disseminated to the

public through advertising, public relations, news, sales or other media without the prior written consent and approval of the appraiser.

4. Definitions used in this report have been taken from *The Dictionary of Real Estate Appraisal*, 5th ed., published by the Appraisal Institute, copyright 2010, unless otherwise stated.

5. I relied on a set of plans entitled "Erwin Road, Skyway Site #NC-08828," prepared by Tower Engineering Professionals and last revised February 11, 2015. For purposes of this report, this information is assumed to be correct. Copies of pages from these plans are in the addenda.

6. I relied on public records from the Orange and Durham County Tax Offices, the Orange and Durham County Register of Deeds, the Triangle Multiple Listing Service and antennasearch.com for information regarding properties analyzed in this report. For purposes of this report, this information is assumed to be correct.

PURPOSE, INTENDED USE AND USERS OF THE REPORT

The purpose of this analysis is to estimate the effect of a proposed telecommunications tower on adjoining and abutting properties. The intended use of the report is to assist the approving body in determining the effect of the proposed use. The intended users of this report are officers and employees of Nexsen Pruet, PLLC and anyone they designate.

DEFINITION OF VALUE

The opinions of value in this analysis are the market values. The definition of market value is that used by federally regulated financial institutions. I found this definition on page A-105 of the *2014-2015 Uniform Standards of Professional Appraisal Practice* (USPAP). This definition is as follows:

> The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:
>
> 1. buyer and seller are typically motivated;
>
> 2. both parties are well informed or well advised, and acting in what they consider their best interests;
>
> 3. a reasonable time is allowed for exposure in the open market;
>
> 4. payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and

5. the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

DATE OF ANALYSIS AND DATE OF REPORT

The effective date of the analysis is March 31, 2015. The date of the report is April 9, 2015.

PROPERTY RIGHTS

The ownership interest considered in this analysis is the fee simple interest. The properties may be leased or have other property rights transferred, but the effect is for the fee simple value of the properties. The definition of fee simple as used in this report is:

> Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat.

SCOPE OF WORK

The scope of the report involves collection and confirmation of data relative to the property with the proposed tower and adjoining and abutting properties. I made an inspection of the proposed tower site and referred to a set of plans for the tower. I also made an exterior inspection, from the street right-of-way of those properties that surround or adjoin the proposed tower site. I researched properties around existing cell towers to locate those that sold for comparison purposes. I located a subdivision in Orange County to judge the effect of the proposed tower on property values of the properties that adjoin or abut the property.

PART THREE – PRESENTATION OF DATA

NEIGHBORHOOD AND LOCATIONAL DATA

The proposed tower is located in eastern Orange County, North Carolina near the Orange and Durham County lines. This area is a mixture of rural, suburban and agricultural uses. It was previously a typical rural area with mixture of woodland, agricultural, and scattered residential uses, but new development has occurred in the past few years due to its proximity to Chapel Hill, Durham and the Research Triangle Park. A location map for the subject on the following page.

It is adjacent to the City of Durham and about 2 miles north of the Chapel Hill town limits.

The Orange County area is less developed but there is a retirement center on the county line. In Durham County is an elementary school, Forestview, and a small apartment development. A short distance to the east in Durham County are several residential subdivisions, Montvale, Lochnora, Winstead, Soleterra, Stonegate, and Carillon Forest to name the closest. There are several other subdivisions in the area but further away. Also in the area are private schools, churches and recreation centers.

The neighborhood is stable and property values should not change significantly in the near future.

DESCRIPTION OF PROPOSED TOWER SITE

Since the purpose of this report is to estimate the effect of the proposed tower on adjoining and abutting properties and not the tower or the land the tower is on, only a brief description of the tower and site is given. More details of the site and tower are in the addenda.

The land where the tower will be located is owned by Leah Marie Bergman. The Orange County tax office identifies it with a parcel number of 0801154533. According to tax records, the land area is 6 acres. The property is improved with a single family dwelling and several outbuildings used for horses. Tax records indicate that the dwelling has 1,288 square feet of area and was built in 1979. The site is mostly cleared with strips of wooded area along the perimeter.

DeLorme Street Atlas USA® 2013

Location Map

Data use subject to license.

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www.delorme.com

DESCRIPTION OF THE PROPOSED TOWER

The tower will be of monopole design 125 feet in height with a 4 foot lightning rod for a total of 129 feet. It will be located on a 100' x 100' leased area near the southern end of the property. The tower will not be lit. A 60' x 60' area will be enclosed with eight foot high solid wood fence with three strand barbed wire that will contain the equipment. There will be a 20 foot landscaped buffer between the fenced area and the remainder of the leased area. There will be an equipment shed 10' x 12' concrete equipment pad. On this pad will be metal equipment boxes none over 8' in height. There will also be an ice bridge between the equipment and the tower less than 8' in height. Space is available for three additional equipment buildings for co-location on the tower. There will be a 4' by 4' service rack. The tower will be accessed by a 20' gravel drive on a 30 foot wide access and utility easement from Mt. Sinai Road.

The tower will be 137' 6" from Mt. Sinai Road, 137' 6" from the western property boundary, about 427 feet from the northern boundary and 3344 feet from the eastern boundary. The area of the proposed tower is cleared but there is an existing 3 slat wood fence.

DESCRIPTION OF ADJOINING AND ABUTTING PROPERTIES

There are eight properties that adjoin, abut or are across the street from the tower parcel. A chart of these properties is on the following page.

Owner	Address	Land Size	Building Size
William G Waller	4919 Kerley Road	38.367	Various
William G Waller	3130 Mt Sinai Road	0.725	1,964
Durham Public Schools	3007 Mt Sinai Road	20.94	NA
Orange County Healthcare	5935 Mt Sinai Road	5.804	NA
William Wilkins	5917 Mt Sinai Road	4.65	1,840
Rebecca Hall	5916 Mt Sinai Road	1.4	1,942
Mark Waller	5010 Kerley Road	1.17	1,118
Lee Ray Bergman	5909 Bergman Drive	8.86	888

One of these properties is a large farm and the closest part of the farm is a large field. Another is a public school that is located diagonally to the tower property and all improvements are well away. One is a retirement facility located close to Mt Sinai Road. Another is a large tract located diagonally to the tower property. The other four are improved with single family dwellings one of which is on a large wooded tract.

PART FOUR – ANALYSIS OF DATA AND CONCLUSIONS

ESTIMATED EFFECT OF THE PROPOSED TELECOMMUNICATIONS TOWER

The potential adverse affects from any proposed improvement are environmental hazards, noise, odor, lighting, traffic and visual impact. Based on the plans of the proposed tower and conversations with those associated with it, there will be no environmental hazards associated with the proposed use. Also after construction there should be no significant adverse noise since the site is unmanned and none of the proposed items produce any significant noise. The improvement should also not produce any adverse odors. The tower will not be lit. Also traffic should not cause any significant adverse impact since the facility requires only periodic maintenance. The tower would be visible and this has the potential to cause adverse impacts on the adjoining and abutting properties.

There is a line of trees along the northern, eastern and western boundaries. There is also a small area with trees along the southern boundary. The tower property is currently fenced, but this fence is about five feet high and is not solid. The non-tower improvements will be mostly covered by the proposed solid wood fence and would not be any more intrusive than typical residential or agricultural structures. The only potential adverse effect is the visual impact of the tower itself on the adjoining or abutting properties.

Of the adjoining and abutting properties, the type with the greatest potential for an adverse effect are the single family dwellings.

To estimate the effect of a cell tower on adjoining or abutting properties, I located a subdivision where a cell tower was adjacent. The subdivision is part of Lake Hogan Farms in northeastern Carrboro and has a total of 82 lots. The cell tower is to the east of the subdivision and the property where the tower is located is adjacent to five of the lots. It is also visible from 27 of the other lots.

Using the Triangle MLS I located sales that occurred from March of 2001 to July of 2014. From those found, I only considered those without basements that were built after 1999. There were a total of 84 sales (some of the properties sold more than once). Of these 46 did not have a view of the tower and 38 did have a view. This tower was 170 feet in height, was not a monopole but a

lattice type structure which is much more visible. The appearance of this tower is less appealing than the proposed subject tower both in height and design.

I prepared charts of the Hogan Farm sales and copies are on the following pages. I adjusted the sales for differences in closing date, age, garage size and number of fireplaces. They are all in the same neighborhood, were built by the same builders and are similar in quality. They are similar in all respects not adjusted for. The comparables were then analyzed on a per square foot basis.

As seen, the comparables with a view of the tower sold for an average of $152.77 per square foot compared with the comparables without a view for an average of $151.70 per square foot. This indicates a difference of 0.65%. This difference is likely from small differences in the sales and indicate that the presence of the tower has no adverse effect on property values.

CONCLUSION

Cellular telephones have become a necessary and desired item in today's world. Many potential buyers of real estate expect cellular communications just as they expect electric service and lack of this service could adversely affect value. In order to meet this need, telecommunications towers have become a common part of the landscape in much the same way that power and telephone lines and other utilities have. Like these utilities, telecommunications towers are needed in locations throughout the country. As such they are in harmony with the area in the same way that other utilities are.

Based on a set of plans of the proposed tower, an inspection of the proposed tower site and the surrounding and adjoining properties, an analysis of data gathered and facts and conclusions as contained in this report and subject to the assumptions and limiting conditions as stated, it is my opinion that the proposed tower will not adversely affect the property values of the properties that adjoin or abut the property.

DWELLINGS IN LAKE HOGAN FARMS WITH NO TOWER VIEW											
Address	Sold Price	Closing Date	Adjusted for Close	Yr Blt	Adjusted for Year	Garage	Adjusted for Gar	FP	Adjusted for FP	Living Area	Price/SF
106 Hogan Woods Circle	$404,096	3/28/2001	$492,997	2001	$492,997		$492,997		$492,997	3,300	$149.39
104 Hogan Woods Circle	$417,374	5/19/2001	$509,196	2001	$509,196		$509,196		$509,196	3,586	$142.00
105 Hogan Woods Circle	$419,767	5/30/2001	$512,116	2001	$512,116		$512,116		$512,116	3,553	$144.14
102 Hogan Woods Circle	$364,990	8/30/2001	$445,288	2001	$445,288		$445,288		$445,288	3,037	$146.62
107 Hogan Woods Circle	$396,129	9/28/2001	$483,277	2001	$483,277		$483,277		$483,277	3,413	$141.60
103 Hogan Woods Circle	$421,424	10/24/2001	$514,137	2001	$514,137		$514,137		$514,137	3,565	$144.22
420 Hogan Woods Circle	$424,990	12/20/2001	$518,488	2001	$518,488		$518,488		$518,488	3,565	$145.44
407 Hogan Woods Circle	$460,860	3/12/2002	$511,555	2002	$511,555		$511,555		$511,555	3,565	$143.49
405 Hogan Woods Circle	$487,000	4/30/2002	$540,570	2001	$545,976		$545,976	1	$539,728	3,553	$151.91
409 Hogan Woods Circle	$458,895	5/29/2002	$509,373	2002	$509,373	2	$490,498	1	$484,250	3,697	$130.98
307 Hogan Woods Circle	$456,150	5/30/2002	$506,327	2002	$506,327		$506,327		$506,327	3,565	$142.03
418 Hogan Woods Circle	$440,000	6/20/2002	$488,400	2002	$488,400	2	$469,524	1	$463,276	3,495	$132.55
100 Arbor Creek Court	$534,267	6/25/2002	$593,036	2002	$593,036	3	$564,723	1	$558,475	3,663	$152.46
402 Hogan Woods Circle	$443,780	7/5/2002	$492,596	2002	$492,596	3	$464,282	1	$458,034	3,361	$136.28
401 Hogan Woods Circle	$501,175	8/16/2002	$556,304	2002	$556,304	2	$537,428	1	$531,181	3,662	$145.05
410 Hogan Woods Circle	$484,569	10/28/2002	$537,872	2002	$537,872	2	$518,996	1	$512,748	3,680	$139.33
412 Hogan Woods Circle	$445,432	10/28/2002	$494,430	2002	$494,430	2	$475,554	2	$463,058	3,495	$132.49
102 Arbor Creek Court	$507,365	11/21/2002	$563,175	2002	$563,175	3	$534,862	1	$528,614	3,286	$160.87
403 Hogan Woods Circle	$455,611	12/9/2002	$505,728	2002	$505,728	3	$477,415	1	$471,167	3,361	$140.19
404 Hogan Woods Circle	$457,808	12/21/2002	$508,167	2002	$508,167	2	$489,291		$489,291	3,116	$157.03
101 Arbor Creek Court	$536,494	2/12/2003	$584,778	2002	$590,626	3	$562,313		$562,313	3,495	$160.89
416 Hogan Woods Circle	$484,334	2/20/2003	$527,924	2002	$533,203	3	$504,890	1	$498,642	3,663	$136.13
104 Arbor Creek Court	$487,500	2/27/2003	$531,375	2002	$536,689	3	$508,375	1	$502,127	3,068	$163.67
414 Hogan Woods Circle	$451,483	7/11/2003	$492,116	2003	$492,116	3	$463,803	1	$457,555	3,116	$146.84
102 Hogan Woods Circle	$430,000	8/11/2003	$468,700	2001	$478,074	2	$459,198	1	$452,950	3,400	$133.22
411 Hogan Woods Circle	$520,000	8/25/2003	$566,800	2003	$566,800	3	$538,486	1	$532,238	3,663	$145.30
314 Hogan Woods Circle	$509,664	7/23/2004	$479,084	2004	$479,084	2	$460,208	1	$453,961	3,116	$145.69
305 Hogan Woods Circle	$590,496	9/15/2004	$555,066	2004	$555,066	3	$526,753	1	$520,505	3,680	$141.44
416 Hogan Woods Circle	$518,000	10/15/2004	$486,920	2002	$496,658	3	$468,345	1	$462,097	3,848	$120.09

105 Hogan Woods Circle	$567,500	11/23/2004	$533,450	2001	$549,454	2	$530,578	1	$524,330	4,300	$121.94
103 Hogan Woods Circle	$585,000	8/16/2005	$561,600	2001	$584,064	2	$565,188	1	$558,940	3,620	$154.40
105 Hogan Woods Circle	$645,000	7/2/2006	$625,650	2000	$663,189	2	$644,313	1	$638,065	4,200	$151.92
106 Hogan Woods Circle	$576,000	8/29/2006	$558,720	2001	$586,656	2	$567,780	1	$561,532	3,459	$162.34
409 Hogan Woods Circle	$680,000	6/12/2007	$598,400	2001	$634,304	2	$615,428	1	$609,180	3,620	$168.28
314 Hogan Woods Circle	$650,000	7/12/2007	$572,000	2004	$589,160	2	$570,284	1	$564,036	3,222	$175.06
412 Hogan Woods Circle	$695,000	7/15/2008	$667,200	2002	$707,232	2	$688,356	1	$682,108	3,495	$195.17
414 Hogan Woods Circle	$650,000	7/17/2008	$624,000	2003	$655,200	2	$636,324	1	$630,076	3,402	$185.21
410 Hogan Woods Circle	$575,000	3/9/2009	$569,250	2002	$609,098	2	$590,222	1	$583,974	3,800	$153.68
407 Hogan Woods Circle	$644,000	12/1/2009	$637,560	2002	$682,189	3	$653,876	1	$647,628	3,993	$162.19
418 Hogan Woods Circle	$590,000	7/16/2010	$554,600	2002	$598,968	2	$580,092	1	$573,844	3,473	$165.23
105 Hogan Woods Circle	$655,000	6/13/2013	$674,650	2000	$762,355	2	$743,479	1	$737,231	4,436	$166.19
401 Hogan Woods Circle	$635,000	7/30/2013	$654,050	2002	$725,996	3	$697,682	1	$691,434	3,783	$182.77
106 Hogan Woods Circle	$599,000	8/29/2013	$616,970	2000	$697,176	2	$678,300	1	$672,052	3,571	$188.20
102 Hogan Woods Circle	$539,000	9/19/2013	$555,170	2001	$621,790	2	$602,915	1	$596,667	3,400	$175.49
101 Arbor Creek Court	$630,000	5/30/2014	$630,000	2002	$705,600	3	$677,286	1	$671,038	4,000	$167.76
409 Hogan Woods Circle	$610,000	6/27/2014	$610,000	2001	$689,300	2	$670,424	1	$664,176	3,685	$180.24
	$530,091			2002						3,566	$152.77

DWELLINGS IN LAKE HOGAN FARMS WITH A TOWER VIEW											
Address	Sold Price	Closing Date	Adjusted for Close	Yr Blt	Adjusted for Year	Garage	Adjusted for Gar	FP	Adjusted for FP	Living Area	Price/SF
111 Hogan Woods Circle	$433,824	3/28/2001	$529,265	2001	$529,265		$529,265		$529,265	3,300	$160.38
112 Hogan Woods Circle	$405,759	3/28/2001	$495,026	2001	$495,026		$495,026		$495,026	3,300	$150.01
110 Hogan Woods Circle	$427,779	5/18/2001	$521,890	2001	$521,890		$521,890		$521,890	3,586	$145.54
109 Hogan Woods Circle	$452,598	6/28/2001	$552,170	2001	$552,170		$552,170		$552,170	3,495	$157.99
115 Hogan Woods Circle	$414,721	7/25/2001	$505,960	2001	$505,960		$505,960		$505,960	3,037	$166.60
114 Hogan Woods Circle	$470,518	7/27/2001	$574,032	2001	$574,032		$574,032		$574,032	3,650	$157.27
108 Hogan Woods Circle	$404,341	8/28/2001	$493,296	2001	$493,296		$493,296		$493,296	3,586	$137.56
115 Hogan Woods Circle	$411,413	9/19/2001	$501,924	2001	$501,924		$501,924		$501,924	3,472	$144.56
201 Hogan Woods Circle	$537,775	12/30/2003	$596,930	2004	$596,930	3	$568,617	1	$562,369	3,536	$159.04
207 Hogan Woods Circle	$519,248	3/31/2004	$540,018	2004	$540,018	2	$521,142	1	$514,894	3,392	$151.80
111 Hogan Woods Circle	$522,000	6/1/2004	$542,880	2001	$559,166	3	$530,853	1	$524,605	3,541	$148.15
114 Hogan Woods Circle	$618,000	6/23/2004	$642,720	2001	$662,002	3	$633,688	1	$627,440	4,144	$151.41
301 Hogan Woods Circle	$576,300	6/28/2004	$599,352	2004	$599,352	3	$571,038	1	$564,790	3,663	$154.19
101 Randolph Court	$546,627	6/29/2004	$568,492	2004	$568,492	3	$540,178	1	$533,931	3,663	$145.76
102 Randolph Court	$509,352	6/29/2004	$529,726	2004	$529,726	2	$510,850	1	$504,602	3,372	$149.64
308 Hogan Woods Circle	$515,065	7/14/2004	$535,668	2004	$535,668	2	$516,792	1	$510,544	3,361	$151.90
303 Hogan Woods Circle	$585,666	8/5/2004	$609,093	2004	$609,093	3	$580,779	1	$574,531	3,372	$170.38
203 Hogan Woods Circle	$587,519	8/25/2004	$611,020	2004	$611,020	3	$582,706	1	$576,458	3,680	$156.65
306 Hogan Woods Circle	$552,230	9/22/2004	$574,319	2004	$574,319	3	$546,006	1	$539,758	3,663	$147.35
202 Hogan Woods Circle	$482,500	12/17/2004	$501,800	2004	$501,800	2	$482,924	1	$476,676	3,495	$136.39
209 Hogan Woods Circle	$584,615	12/22/2004	$608,000	2004	$608,000	3	$579,686	1	$573,438	3,663	$156.55
100 Randolph Court	$530,427	1/18/2005	$509,210	2004	$514,302	3	$485,988	1	$479,740	3,489	$137.50
211 Hogan Woods Circle	$635,959	2/4/2005	$610,521	2005	$610,521	3	$582,207	1	$575,959	3,986	$144.50
205 Hogan Woods Circle	$526,247	2/17/2005	$505,197	2005	$505,197	2	$486,321	1	$480,073	3,116	$154.07
302 Hogan Woods Circle	$499,490	5/28/2005	$479,510	2005	$479,510	2	$460,635	1	$454,387	3,116	$145.82
204 Hogan Woods Circle	$527,339	7/23/2005	$506,245	2005	$506,245	2	$487,370	1	$481,122	3,372	$142.68
103 Randolph Court	$526,891	8/22/2005	$505,815	2005	$505,815	2	$486,940	1	$480,692	3,361	$143.02
101 Randolph	$586,000	9/21/2006	$568,420	2004	$579,788	3	$551,475	1	$545,227	3,663	$148.85
209 Hogan Woods Circle	$625,000	6/2/2009	$618,750	2004	$649,688	3	$621,374	2	$608,878	3,694	$164.83

203 Hogan Woods Circle	$645,000	6/15/2010	$606,300	2004	$642,678	2	$623,802	1	$617,554	3,980	$155.16
303 Hogan Woods Circle	$675,000	6/21/2010	$634,500	2004	$672,570	3	$644,256	1	$638,008	3,743	$170.45
110 Hogan Woods Circle	$625,000	7/28/2010	$587,500	2001	$640,375	3	$612,061	1	$605,813	3,798	$159.51
108 Hogan Woods Circle	$599,000	3/10/2011	$497,170	2001	$546,887	2	$528,011	1	$521,763	3,625	$143.93
100 Redfoot Run	$610,000	3/28/2011	$506,300	2005	$536,678	3	$508,364	1	$502,116	4,151	$120.96
207 Hogan Woods Circle	$517,500	5/15/2013	$533,025	2004	$580,997	2	$562,121	1	$555,874	3,397	$163.64
302 Hogan Woods Circle	$525,000	2/3/2014	$525,000	2005	$572,250	2	$553,374	1	$547,126	3,240	$168.87
100 Redfoot Run Road	$600,000	6/30/2014	$600,000	2005	$654,000	3	$625,686	1	$619,438	4,470	$138.58
114 Hogan Woods Circle	$650,000	7/18/2014	$650,000	2001	$734,500	3	$706,186	1	$699,938	4,289	$163.19
		1/13/2006	$554,659	2003						3,591	$151.70

DAVID A. SMITH, MAI, SRA

DAVID A SMITH & ASSOCIATES, INC.
P.O. BOX 51597
DURHAM, NORTH CAROLINA 27717-1597
PHONE (919) 493-1534

QUALIFICATIONS OF DAVID A. SMITH, MAI, SRA

The appraiser, David A. Smith, was affiliated with Charles W. Smith Associates from 1976 to 2003. After the retirement of Charles W. Smith in 2003 he formed Smith & Whitfield, Inc. and later David A. Smith & Associates. Prior to 1981 most of the time was spent in research and gathering the other background experience necessary to appraisers. Starting in 1981, he began co-authoring residential appraisals with Mr. Charles W. Smith, MAI, SRPA and after 1982 began writing residential reports on his own. In 1988 he was awarded the RM designation. With the merger of the American Institute of Real Estate Appraisers and the Society of Real Estate Appraisers in January of 1991, the RM designation will no longer be awarded and all RM's were given the option to convert their designation to SRA. Mr. Smith made that election.

Since 1985 he has been primarily authoring and co-authoring non-single family reports. He has also trained and supervised several appraisers preparing all types of appraisal reports as well as authoring them himself. In 1991 he was awarded the MAI designation of the Appraisal Institute. He is also a State-Certified General Real Estate Appraiser for the State of North Carolina (No. A281).

EDUCATION: A.B., Duke University, 1981

COMPLETED APPRAISAL INSTITUTE COURSES:

Real Estate Appraisal Principles (Exam 1A-1/8-1)
University of North Carolina, 1981

Residential Valuation (Exam 8-2)
University of North Carolina, 1981

Basic Valuation Procedures (Exam 1A-2)
University of North Carolina, 1983

Standards of Professional Practice (Exam SPP)
University of North Carolina, 1983, 1997

Capitalization Theory & Techniques, A (Exam 1B-A)
University of Colorado, 1984

Capitalization Theory & Techniques, B (Exam 1B-B)
University of Colorado, 1984

Valuation Analysis and Report Writing (Exam 2-2)
University of North Carolina, 1987

Case Studies in Real Estate Valuation (Exam 2-1)
University of North Carolina, 1987

Advanced Sales Comparison & Cost Approaches
Atlanta Georgia, 2002

General Market Analysis and Highest and Best Use
Atlanta, Georgia, 2007

APPRAISAL INSTITUTE SEMINARS:

Highest and Best Use, 1988
Industrial Valuation, 1988
Rates, Ratios and Reasonableness, 1988
Valuation of Leased Fee Interests, 1989
Current Problems in Industrial Valuation, 1989
Methods of Subdivision Analysis, 1989
Expert Witness in Litigation, 1989
Discounted Cash Flow, 1990
RTC Appraisal Standards, 1990
Preparation and Use of the UCIAR Form, 1990
Standards of Professional Practice Update, 1990
Commercial Construction Overview, 1991
Appraising Troubled Properties, 1991
Appraisal Regulations of the Federal Banking Association, 1992
Real Estate Law for Appraisals, 1992
Appraising Apartments, 1993
Discounted Cash Flow Analysis, 1994
Appraiser's Legal Liabilities, 1994
Understanding Limited Appraisals & Reporting Options, 1994
Analysis Operating Expenses, 1995
Future of Appraisals, 1996
Highest and Best Use Applications, 1996
Litigation Skills for the Appraiser, 1997
Eminent Domain & Condemnation Appraising, 1998
Matched Pairs/Highest & Best Use/Revisiting Report Options, 1998
Valuation of Detrimental Conditions, 1998
Appraisal of Nonconforming Uses, 2000
Using GIS to Keep Pace With Changes in Real Estate Industry, 2001
Feasibility Analysis, Market Value and Investment Timing, 2002
Analyzing Commercial Lease Clauses, 2002
Standards of Professional Appraisal Practice, 2002
Effective Appraisal Writing, 2003
Supporting Capitalization Rates, 2004
National USPAP Update, 2004
Rates and Ratios: Making Sense of GIMs, OARs, and DCFs, 2005
The Road Less Traveled: Special Use Properties, 2005
National USPAP Updated, 2006
Appraisal Consulting: A Solutions Approach, 2006

What Clients Would Like Their Appraisers to Know, 2007
Valuation of Detrimental Conditions, 2007
Business Practice and Ethics, 2007
Office Building Valuation: A contemporary Perspective, 2008
Subdivision Analysis, 2008
National USPAP Update, 2009
Effective Appraisal Writing, 2009
Appraisal Curriculum, 2009
Discounted Cash Flow Model: Concepts, Issues and Apps., 2009
National USPAP Update, 2010

OTHER SEMINARS:

Commercial Segregated Cost Seminar, Marshall & Swift, 1988
Appraisal Guide and Legal Principles, Department of Transportation, 1993
The Grammar Game, Career Track, 1994

MEMBERSHIPS:

Appraisal Institute, MAI #09090
Appraisal Institute, SRA/RM #2248
Durham Board of Realtors
North Carolina Association of Realtors
National Association of Realtors

CERTIFICATION:

State Certified General Real Estate Appraiser for North Carolina, #A281

OTHER:

Member of City of Durham Audit Oversight Committee, 2002 – 2006
Member Durham Board of Adjustment, 1994 - 2002
Member Durham City/County Zoning Commission, 1990 – 1995
Broad Member, John Avery Boys and Girls Club, 1994-2002
Trustee Durham Historical Preservation Society, 1992 - 1995
Vice President of the Candidates, 1989, NC Chapter 40
President of the Candidates, 1990, NC Chapter 40
Candidate of the Year, 1990, NC Chapter 40

RECENT CLIENTS:

LENDING INSTITUTIONS
Bank of America
Branch Bank & Trust

Suntrust Bank
RBC Centura
Community Investment Corporation of North Carolina
Fidelity Bank
First Citizens Bank
First Union National Bank
Harrington Bank
Mechanics & Farmers Bank
Mutual Community Savings Bank
North Carolina Mutual Insurance Company
Roxboro Savings Bank
Self Help Credit Union
Southern National Bank
Cardinal State Bank

MUNICIPALITIES AND OTHER GOVERNMENT AGENCIES
City of Durham, North Carolina
County of Durham, North Carolina
Orange County, North Carolina
Town of Chapel Hill, North Carolina
North Carolina Department of Transportation
Housing Authority of Durham
Durham Public Schools
Veteran's Administration

OTHER
Blue Cross and Blue Shield of North Carolina
Carolina Power & Light
Cimarron Capital
Duke Energy Company
Durham Technical Institute
General Telephone of the Southeast
IBM Corporation
Moore & Van Allen
Maupin, Taylor & Ellis
Northgate Associates
Property Advisory Services
Stubbs, Cole, Breedlove & Prentis
Teer Associates
The Pantry
Ticon, Inc.
UDI Community Development Corporation
Womble, Carlyle & Sandridge

In addition, Mr. Smith has made appraisals for other lending institutions, municipalities, individuals, corporations, estates and attorneys. Appraisal assignments have been made throughout the Triangle, North Carolina, and South Carolina.

Properties appraised include all types of single family residential, multi-family residential, office, retail, commercial, industrial and specialty type uses both vacant and improved, existing and proposed.

Appraisal assignments were for a variety of purposes including: mortgage loans, estate planning, condemnation, bankruptcy and equitable distribution.

ADDENDA

PHOTOGRAPHS OF SUBJECT

Street Scene along Mount Sinai Road

Street Scene along Kerley Road

PHOTOGRAPHS OF SUBJECT

Apartments near Site

Retirement Home near Site

PHOTOGRAPHS OF SUBJECT

Area of Proposed Tower Site

Area of Proposed Tower Site

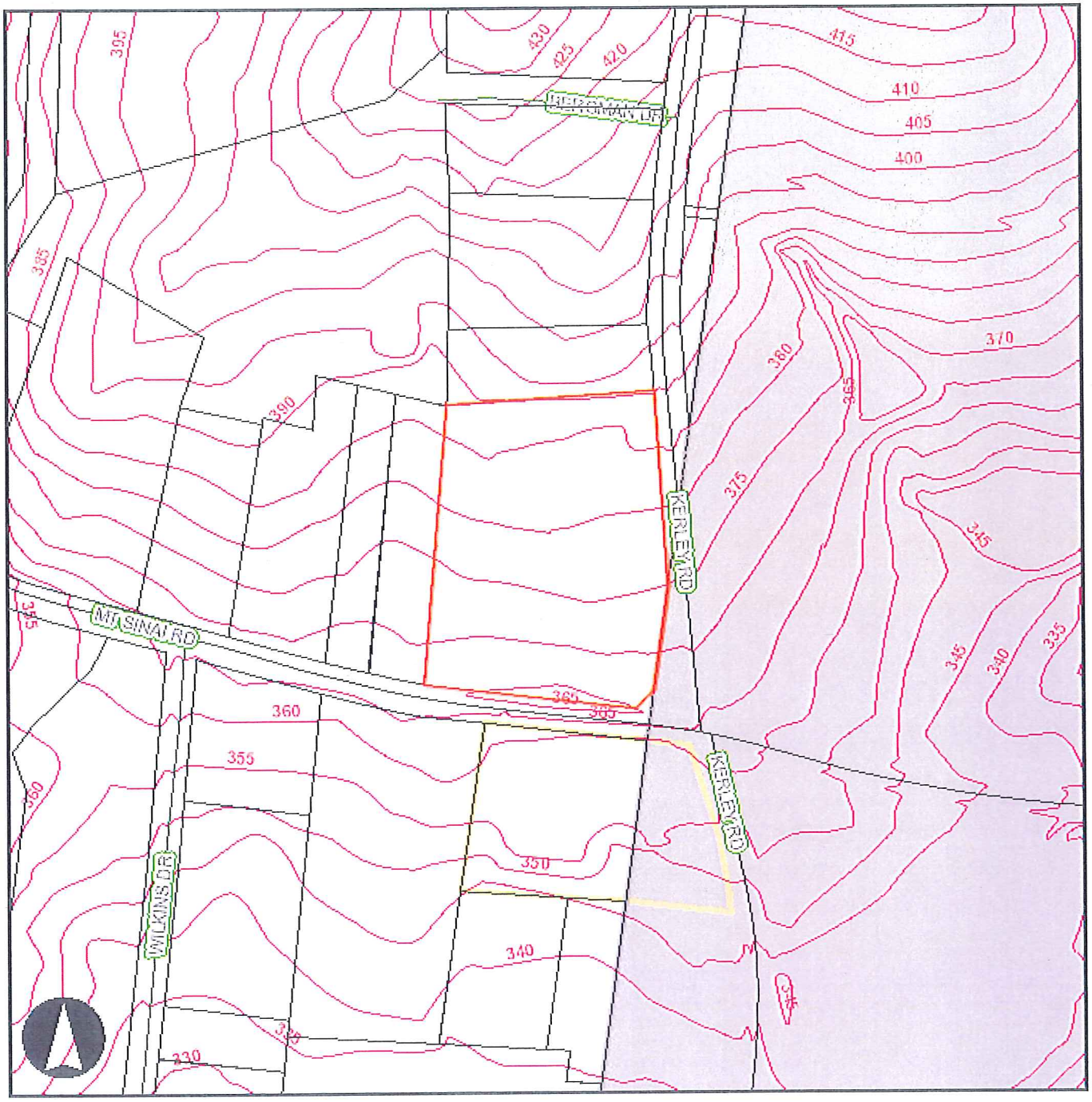
PHOTOGRAPHS OF SUBJECT

Utility Lines near Site

Utility Lines near Site

Orange County, NC GIS

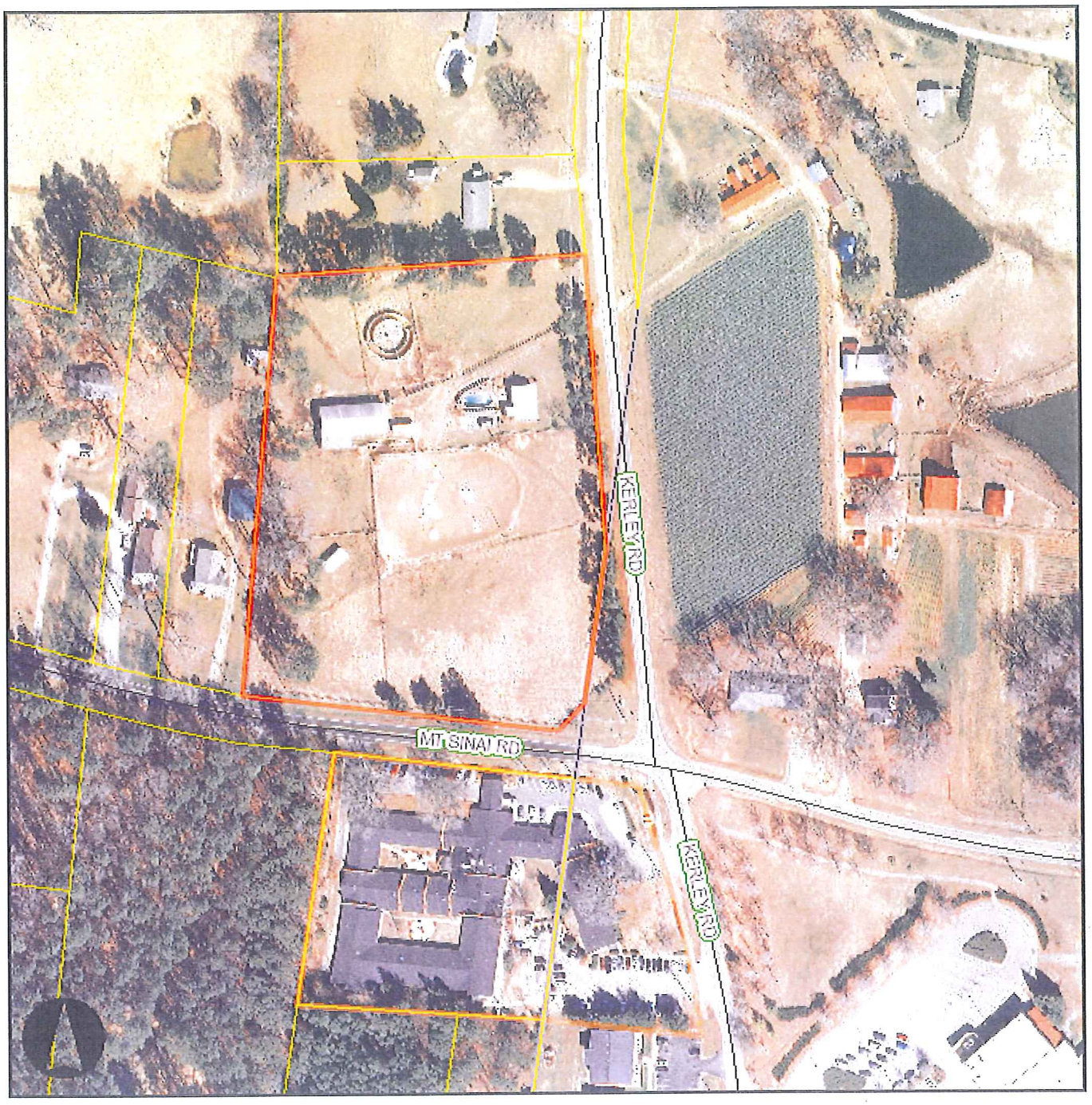
Flood Topo Map



1 inch = 300 feet
Created on 3/30/2015. Orange County, North Carolina.

Orange County, NC GIS

Aerial Map



1 inch = 200 feet
Created on 3/30/2015. Orange County, North Carolina.

Unofficial Property Record Card - Orange County, NC

General Property Data

Parcel ID 0801154533
Property Owner BERGMAN LEAH MARIE

Mailing Address 5022 KERLEY RD

City DURHAM
State NC
Zipcode 27705

Property Location 5022 KERLEY RD
Property Use RES
Most Recent Sale Date 3/18/2010
Legal Reference 4916/194
Grantor LEE RAY BERGMAN
Sale Price 275,000
Land Area 6 AC

Current Property Assessment

Card 1 Value Building Value 81,459 | Other Features Value 19,592 | Land Value 215,758 | Total Value 316,809

Building Description

Building Style Conventional
# of Living Units 1
Year Built 1979
Finished Area (SF) 1288
Full Baths 2
# of Other Fixtures 3

Foundation Type Masonry
Roof Structure Gable
Roof Cover Shingle
Siding Frame
1/2 Baths 0

Heating Type Combo H&A
Heating Fuel N/A
Air Conditioning 100%
# of Bsmt Garages 0
3/4 Baths 0

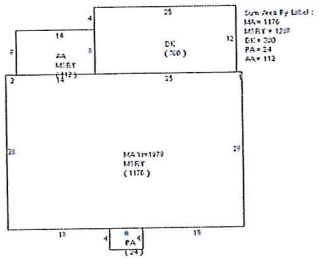
Legal Description

N/E INT SR 1718 & 1717 P36/148

Narrative Description of Property

This property contains 6 AC of land mainly classified as RES with a(n) Conventional style building, built about 1979 , having a finished area of 1288 square feet, with Frame exterior and Shingle roof cover, with 1 unit(s).

Property Sketch



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

20100318000052550 1/3

FILED Joyce H. Pearson
Register of Deeds, Orange Co,NC
Recording Fee: $25.00
NC Real Estate TX: $550.00

20100318000052550 DEED
Bk:RB4916 Pg:194
03/18/2010 02:48:40 PM 1/3

NORTH CAROLINA GENERAL WARRANTY DEED

Excise Tax: $550.00

Parcel Identifier No. **0801-15-4533**

Prepared By: John C. Wainio, Attorney at Law

Return to: Grantee

Brief Description for Index: Greater portion of Tract A, Property of Dallas Crabtree, PB 14/138, PB 36/148

THIS DEED made this 17th day of March, 2010 by and between:

GRANTOR	GRANTEE
LEE RAY BERGMAN, LLC	**LEAH MARIE BERGMAN** 5022 Kerley Road Durham, NC 27705

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration, has and by these presents does grant and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the County of Durham, North Carolina, and more particularly described as follows:

SEE EXHIBIT A ATTACHED AND INCORPORATED HEREIN.

The Property hereinabove described was acquired by Grantor by instrument recorded in Book 1450, at Page 288.

A map showing the above described property is recorded in Plat Book 14, Page 138. See also Plat Book 36, Page 148.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinabove described is subject to the following exceptions:

Easements, restrictive covenants and taxes of record.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

IN TESTIMONY WHEREOF, the said Grantors have hereunto set their hands and seal, the day and year first above written.

LEE RAY BERGMAN, LLC

By: _____ **(SEAL)**
Member-Manager

SEAL-STAMP

JACKIE B. PASCHALL
Notary Public, North Carolina
Durham County
My Commission Expires
January 04, 2013

NORTH CAROLINA, Durham COUNTY

I, Jackie B. Paschall, a Notary Public of the County and State aforesaid, certify that LEAH MARIE BERGMAN, Member-Manager of Lee Ray Bergman, LLC, did personally appeared before me this day and acknowledged the execution of the foregoing instrument for the uses and purposes therein set forth.

Witness my hand and official seal, this the 17 day of March, 2010.

My commission expires 01-04-2013 Jackie B. Paschall
Notary Public

2010031800052550
RB4916 196 3/3

EXHIBIT A

PIN: 0801-15-4533

BEGINNING at a stake at the point of intersection of the North side of Mt. Sinai Road and the West side of Kerley Road and running thence along and with the North side of the Mt. Sinai Road North 78° 37' 50" West 501.66 feet to a stake, Jerry Hall's Southeast corner; thence North 9° 39' 10" East 536.37 feet to a stake; thence North 6° 13' 10" East 8.0 feet to a stake; thence South 89° 15' East 396.73 feet to a stake on the West side of Kerley Road; thence South 0° 23' 10" East 630.37 feet to a stake, the point of BEGINNING, containing 6.0 acres, more or less, and being the greater portion of Tract "A" of the PROPERTY OF DALLAS CRABTREE as per plat and survey thereof now on file in the Office of the Register of Deeds of Orange County in Plat Book 14 at page 138, to which reference is hereby made for a more particular description of same.

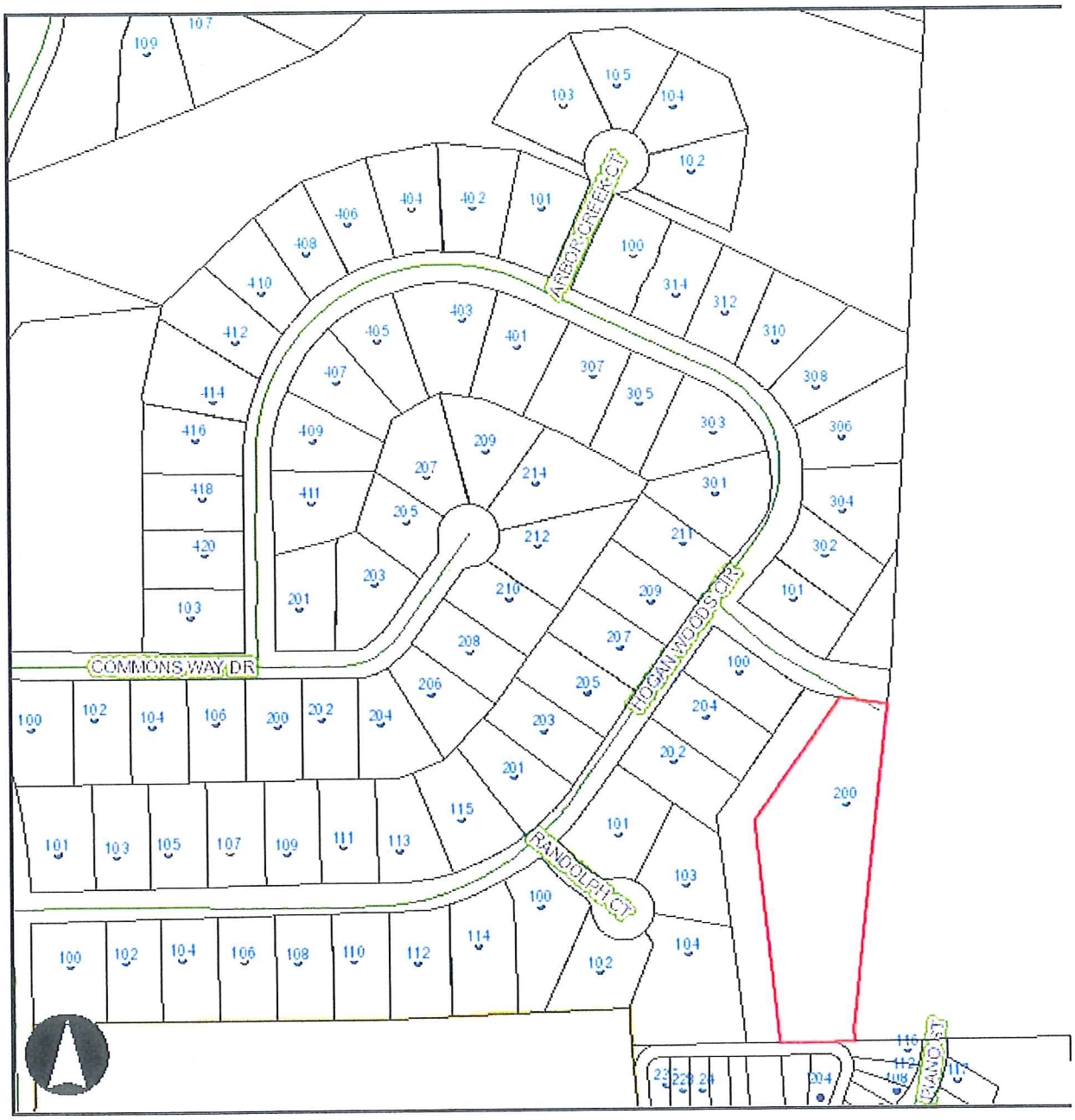
This property also described in boundary survey for Lee Ray Bergman dated January 26, 1983, by Robert W. Young, Land Surveyor, as recorded in Plat Book 36 at page 148, Orange County Registry, to which reference is herewith made for a more particular description of same.

The property hereinabove described was acquired by Lee Ray Bergman by instrument recorded in Book 408, page 483, Orange County Registry.

A map showing the above-described property is recorded in Plat Book 36, page 148, Orange County Registry.

##Rudqjh#Frxqw| /#QF#JLV

Lake Hogan Farms Tax Map



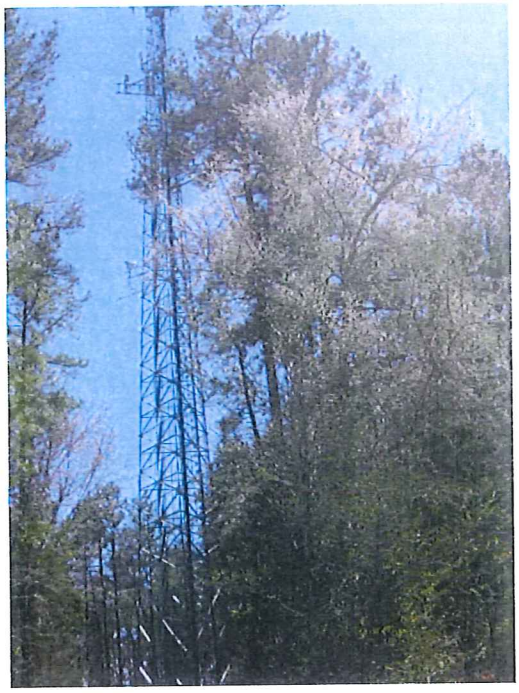
4#qfk#@ #633#ihhw
Fuhdwhg#:q#72;25348 1#Rudqjh#Frxqw| /#Qruk#Fdurdqd1

PHOTOGRAPHS OF LAKE HOGAN FARMS

Tower as seen from 106/107 Hogan Woods Circle

Tower as seen from 103 Randolf Court

PHOTOGRAPHS OF LAKE HOGAN FARMS



Tower as seen from Access Road

Tower as seen from 305/314 Hogan Woods Circle

PHOTOGRAPHS OF LAKE HOGAN FARMS

Tower as seen from 301/306 Hogan Woods Circle

Tower as seen from 204 Hogan Woods Circle

Tower Detail (Not Registered) - Tower (1)

- **Ownership Info**

Owner	Company:	CAROLINA METRONET INC	Address:	Not Recorded
	Contact:	Not Recorded		
	Phone:	Not Recorded		
	Email:	Not Recorded		

- **Structure Characteristics**

Filing #:	88-ASO-754-OE	Ground Elev:	548.3 feet
Latitude:	35.948	Height Of Structure:	213.9 feet
Longitude:	-79.096	Overall Height:	762.2 feet
Structure Type:	Tall Structure	Structure Address:	Not Recorded
Status:	Unknown		
Date Filed:	04/16/1986		

© 2004-2009 by General Data Resources, Inc

LESSEE:

T-Mobile

185 FAIRCHILD STREET
CHARLESTON, SC 29492

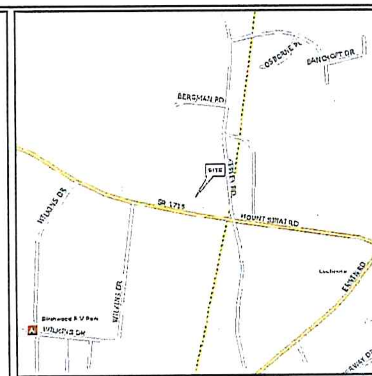
T-MOBILE SITE ID: 5RA0532D
5022 KERLEY ROAD
DURHAM, NC 27705
(ORANGE COUNTY)

PLANS PREPARED FOR:

SKYWAY TOWERS

20525 AMBERFIELD DRIVE, ST 102
LAND O' LAKES, FL 34639

ERWIN ROAD
SKYWAY SITE #: NC-08828



LOCATION MAP

LATITUDE N 35° 59' 26.84" (NAD '83)
LONGITUDE W 78° 59' 42.52" (NAD '83)

GROUND ELEV. (AMSL) = 372.89' (NAVD '88)

1-A COORDINATES

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING:

1. NORTH CAROLINA BUILDING CODE
2. NORTH CAROLINA CODE COUNCIL
3. ANSI/TIA/EIA-222-F
4. NATIONAL ELECTRIC CODE (2008 EDITION)
5. LOCAL BUILDING CODE
6. CITY/COUNTY ORDINANCES

CODE COMPLIANCE

POWER COMPANY: DUKE ENERGY
CONTACT: CUSTOMER SERVICE
PHONE: (800) 452-2777
METER # NEAR SITE: UNKNOWN

TELEPHONE COMPANY: VERIZON
CONTACT: CUSTOMER SERVICE
PHONE: (800) 922-0204
PHONE # NEAR SITE: (919) 489-4684
PEDESTAL # NEAR SITE: DPCO POLE 70

UTILITY INFORMATION

FROM RALEIGH, NC: TAKE I-40 W FOR 10.3 MILES. TAKE EXIT 270 FOR US-15/US-501 AND TURN RIGHT. TAKE THE FIRST LEFT ONTO MT MORIAH RD AND GO 1.4 MILES. TURN RIGHT ONTO ERWIN RD AND GO 1.5 MILES. TURN LEFT ONTO KERLEY RD AND GO 0.3 MILES. TURN LEFT ON MT SINAI RD AND THE SITE WILL BE LOCATED ON THE RIGHT.

DRIVING DIRECTIONS

SKYWAY SITE # : NC-08828
SKYWAY SITE NAME: ERWIN ROAD
PROJECT DESCRIPTION: PROPOSED WIRELESS TELECOMM FACILITY
SITE ADDRESS: 5022 KERLEY ROAD, DURHAM, NC 27705

JURISDICTION: ORANGE COUNTY
DISTURBED AREA: 15,446± S.F. (0.35 AC.)
PRESENT OCCUPANCY TYPE: RESIDENCE/FARM
CURRENT ZONING: RB
PIN NUMBER: 0801154533
TOWER TYPE: 125' MONOPOLE (129' OVERALL)

PROJECT INFORMATION

LESSEE:
NAME: T-MOBILE
ADDRESS: 185 FAIRCHILD STREET
CITY, STATE, ZIP: CHARLESTON, SC 29492
CONTACT: ROBERT HILL
PHONE: (843) 216-1210

TOWER OWNER
NAME: SKYWAY TOWERS, LLC
ADDRESS: 20525 AMBERFIELD DRIVE, SUITE 102
CITY, STATE, ZIP: LAND O'LAKES, FL 34639
CONTACT: JUSTIN JONES
PHONE: (813) 960-6217

SURVEYOR:
NAME: BATEMAN CIVIL SURVEY COMPANY, PC
ADDRESS: 200 NORTH MAIN ST
CITY, STATE, ZIP: HOLLY SPRINGS, NC 27540
CONTACT: STEVEN P. CARLSON, P.L.S.
PHONE: (919) 577-1080

CIVIL ENGINEER:
NAME: TOWER ENGINEERING PROFESSIONALS
ADDRESS: 326 TRYON ROAD
CITY, STATE, ZIP: RALEIGH, NC 27603
CONTACT: JUSTIN J. COSGROVE, P.E.
PHONE: (919) 661-6351

ELECTRICAL ENGINEER:
NAME: TOWER ENGINEERING PROFESSIONALS
ADDRESS: 326 TRYON ROAD
CITY, STATE, ZIP: RALEIGH, NC 27603
CONTACT: MARK S. QUAKENBUSH, P.E.
PHONE: (919) 661-6351

PROPERTY OWNER:
NAME: LEAH M. BERGMAN
ADDRESS: 5022 KERLEY ROAD
CITY, STATE, ZIP: DURHAM, NC 27705
CONTACT: LEAH M. BERGMAN
PHONE: (917) 714-9601

CONTACT INFORMATION

SHEET:	DESCRIPTION:	REV
T-1	TITLE SHEET	2
C-1	SITE PLAN & TOWER ELEVATION	2
C-2	GRADING PLAN & CULVERT DETAILS	2
C-3	LANDSCAPING PLAN & DETAILS	2
C-4	CIVIL DETAILS I	2
C-5	CIVIL DETAILS II	2
E-1	ELECTRICAL NOTES & DETAILS	2
E-2	GROUNDING NOTES & DETAILS I	2
E-3	GROUNDING NOTES & DETAILS II	2

SHEET INDEX

1. ALL REFERENCES MADE TO OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED SKYWAY TOWERS OR IT'S DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF NORTH CAROLINA.
3. THE STRUCTURE SHALL BE DESIGNED IN ACCORDANCE WITH ANSI/TIA-222-G-2-2009. THIS CONFORMS TO THE REQUIREMENTS OF THE NORTH CAROLINA BUILDING CODE, 2012 EDITION.
4. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE NORTH CAROLINA BUILDING CODE, 2012 EDITION.
5. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
6. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
7. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND IT'S COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
8. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATION. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
9. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR INSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
11. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE LESSEE PROJECT MANAGER.
12. BILL OF MATERIALS AND PART NUMBERS LISTED ON CONSTRUCTION DRAWINGS ARE INTENDED TO AID CONTRACTOR/OWNER. CONTRACTOR/OWNER SHALL VERIFY PARTS AND QUANTITIES WITH MANUFACTURER PRIOR TO BIDDING AND/OR ORDERING MATERIALS.
13. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
14. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
15. THE CONTRACTOR SHALL REWORK (DRY, SCARIFY, ETC.) ALL MATERIAL NOT SUITABLE FOR SUBGRADE IN ITS PRESENT STATE. AFTER REWORKING, IF THE MATERIAL REMAINS UNSUITABLE, THE CONTRACTOR SHALL UNDERCUT THIS MATERIAL AND REPLACE WITH APPROVED MATERIAL. ALL SUBGRADES SHALL BE PROOFROLLED WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK PRIOR TO PAVING. ANY SOFT MATERIAL SHALL BE REWORKED OR REPLACED.
16. THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL PIPES, DITCHES, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTED BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO MAINTAIN DRAINAGE STRUCTURE IN OPERABLE CONDITION.
17. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
18. ANY BUILDINGS ON THIS SITE ARE INTENDED TO SHELTER EQUIPMENT WHICH WILL ONLY BE PERIODICALLY MAINTAINED AND ARE NOT INTENDED FOR HUMAN OCCUPANCY.
19. TEMPORARY FACILITES FOR PROTECTION OF TOOLS AND EQUIPMENT SHALL CONFORM TO LOCAL REGULATIONS AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
20. THE CONTRACTOR AND ITS SUBCONTRACTORS SHALL CARRY LIABILITY INSURANCE IN THE AMOUNTS AND FORM IN ACCORDANCE WITH LESSEE SPECIFICATIONS. CERTIFICATES DEMONSTRATING PROOF OF COVERAGE SHALL BE PROVIDED TO LESSEE PRIOR TO THE START OF THE WORK ON THE PROJECT.
21. THE CONTRACTOR SHALL CONTACT ALL APPLICABLE UTILITY SERVICES TO VERIFY LOCATIONS OF EXISTING UTILITIES AND REQUIREMENTS FOR NEW UTILITY CONNECTIONS PRIOR TO EXCAVATING.
22. THE CONTRACTOR SHALL MAINTAIN THE JOB CLEAR OF TRASH AND DEBRIS. ALL WASTE MATERIALS SHALL BE REMOVED FROM THE SITE PRIOR TO SUBSTANTIAL COMPLETION AND PRIOR TO FINAL ACCEPTANCE. THE CONTRACTOR SHALL FURNISH ONE 55 GALLON BARREL, AND TRASH BAGS, AND SHALL REMOVE TRASH, DEBRIS, ETC., ON A DAILY BASIS.
23. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL CONDITIONS PRIOR TO SUBMITTING HIS PROPOSAL. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON THESE DRAWINGS WITH THOSE AT THE SITE. ANY VARIATION WHICH REQUIRES PHYSICAL CHANGE SHALL BE BROUGHT TO THE ATTENTION OF THE SKYWAY TOWERS PROJECT ENGINEER FOR FACILITIES/CONSTRUCTION.
24. THE CONTRACTOR SHALL GUARANTEE THE WORK PERFORMED ON THE PROJECT BY THE CONTRACTOR AND ANY OR ALL OF THE SUBCONTRACTORS WHO PERFORMED WORK FOR THE CONTRACTOR ON THIS PROJECT. THE GUARANTEE SHALL BE FOR A FULL YEAR FOLLOWING ISSUANCE OF THE FINAL PAYMENT OF RETAINAGE. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.

GENERAL NOTES

PLANS PREPARED FOR:

T-Mobile
185 FAIRCHILD STREET
CHARLESTON, SC 29492
OFFICE: (843) 216-1210

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5263
OFFICE: (919) 661-6351
FAX: (919) 661-6350
N.C. LICENSE # C-1794

REV	DATE	ISSUED FOR:
2	02-11-15	CONSTRUCTION
1	01-30-15	PRELIMINARY
0	01-29-15	PRELIMINARY

DRAWN BY: EAH CHECKED BY: JJC

PROJECT INFORMATION:
ERWIN ROAD
TMO ID: 5RA0532D
SKYWAY SITE #: NC-08828
5022 KERLEY ROAD
DURHAM, NC 27705
(ORANGE COUNTY)

SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER 037854 JUSTIN J. COSGROVE

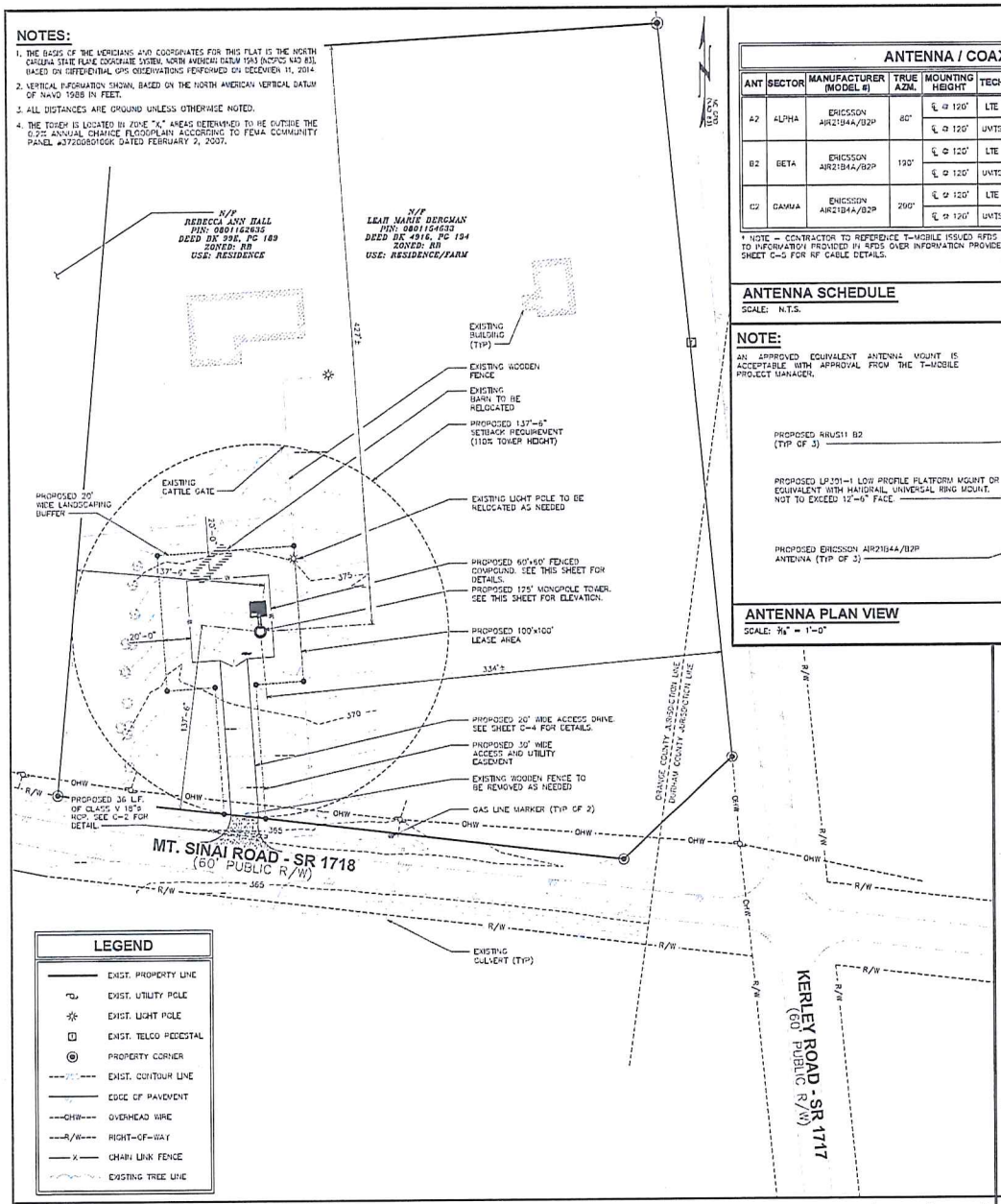
February 11, 2015

SHEET TITLE:
TITLE SHEET

SHEET NUMBER: T-1
REVISION: 2
TEP # 85531

NOTES:

1. THE BASIS OF THE MERIDIANS AND COORDINATES FOR THIS PLAT IS THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (NCSPCS NAD 83), BASED ON DIFFERENTIAL GPS OBSERVATIONS PERFORMED ON DECEMBER 11, 2014.
2. VERTICAL INFORMATION SHOWN, BASED ON THE NORTH AMERICAN VERTICAL DATUM OF NAVD 1988 IN FEET.
3. ALL DISTANCES ARE GROUND UNLESS OTHERWISE NOTED.
4. THE TOWER IS LOCATED IN ZONE "X" AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO FEMA COMMUNITY PANEL #3720080100K DATED FEBRUARY 2, 2007.



SITE PLAN
SCALE: 1" = 40'

ANTENNA / COAX SCHEDULE

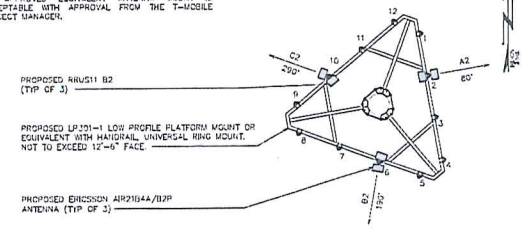
ANT	SECTOR	MANUFACTURER (MODEL #)	TRUE AZM.	MOUNTING HEIGHT	TECH	COAX SIZE	COAX LENGTH	MECH D-TILT	ELEC D-TILT	RRU
A2	ALPHA	ERICSSON AIR21B4A/B2P	80°	℄ @ 120'	LTE	(2) FIBER	150'±	0°	2°	(1) RRUS11 B2
				℄ @ 120'	UMTS	(2) FIBER	150'±	0°	2°	
B2	BETA	ERICSSON AIR21B4A/B2P	190°	℄ @ 120'	LTE	(2) FIBER	150'±	0°	2°	(1) RRUS11 B2
				℄ @ 120'	UMTS	(2) FIBER	150'±	0°	2°	
C2	GAMMA	ERICSSON AIR21B4A/B2P	290°	℄ @ 120'	LTE	(2) FIBER	150'±	0°	2°	(1) RRUS11 B2
				℄ @ 120'	UMTS	(2) FIBER	150'±	0°	2°	

* NOTE – CONTRACTOR TO REFERENCE T-MOBILE ISSUED RFDS AND GIVE PRECEDENCE TO INFORMATION PROVIDED IN RFDS OVER INFORMATION PROVIDED IN THIS TABLE. SEE SHEET C-5 FOR RF CABLE DETAILS.

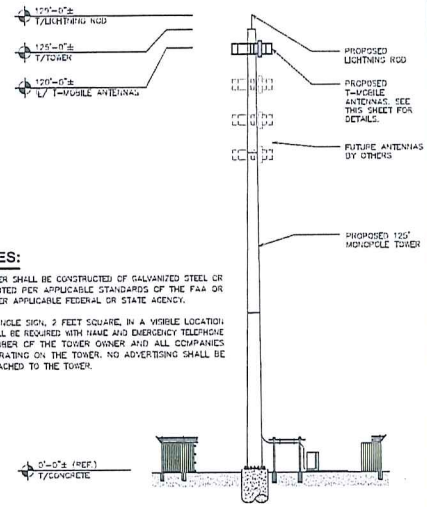
ANTENNA SCHEDULE
SCALE: N.T.S.

NOTE:

AN APPROVED EQUIVALENT ANTENNA MOUNT IS ACCEPTABLE WITH APPROVAL FROM THE T-MOBILE PROJECT MANAGER.



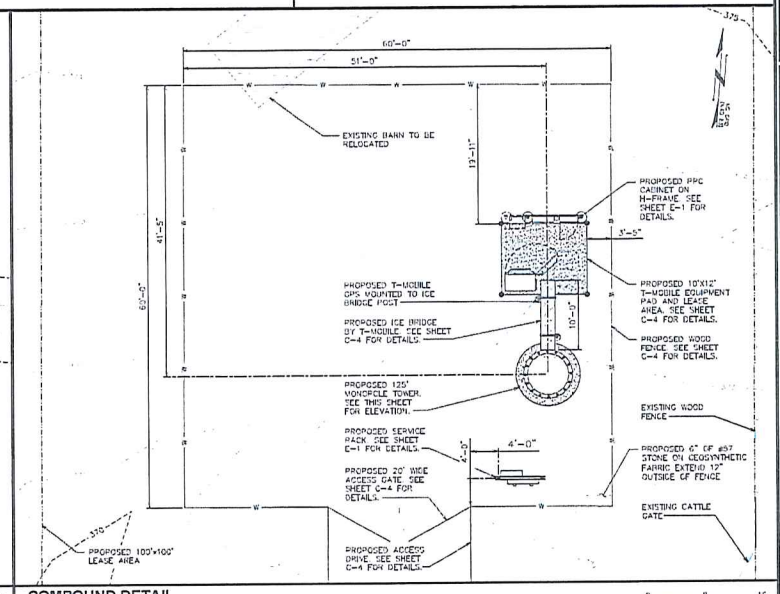
ANTENNA PLAN VIEW
SCALE: 3/16" = 1'-0"



NOTES:

1. TOWER SHALL BE CONSTRUCTED OF GALVANIZED STEEL OR PAINTED PER APPLICABLE STANDARDS OF THE FAA OR OTHER APPLICABLE FEDERAL OR STATE AGENCY.
2. A SINGLE SIGN, 2 FEET SQUARE, IN A VISIBLE LOCATION SHALL BE REQUIRED WITH NAME AND EMERGENCY TELEPHONE NUMBER OF THE TOWER OWNER AND ALL COMPANIES OPERATING ON THE TOWER. NO ADVERTISING SHALL BE ATTACHED TO THE TOWER.

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



COMPOUND DETAIL
SCALE: 1/8" = 1'-0"

PLANS PREPARED FOR:

T-Mobile
185 FAIRCHILD STREET
CHARLESTON, SC 29492
OFFICE: (843) 216-1210

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
FAIRFIELD, CT 06824
OFFICE: (203) 592-5551
FAX: (919) 854-1633
N.C. LICENSE #C-1734

REV	DATE	ISSUED FOR:
2	02-11-15	CONSTRUCTION
1	01-30-15	PRELIMINARY
0	01-23-15	PRELIMINARY

DRAWN BY: BMI | CHECKED BY: JJS

PROJECT INFORMATION:

ERWIN ROAD
TMO ID: 5RA0532D
SKYWAY SITE #: NC-08828
5922 KERLEY ROAD
DURHAM, NC 27705
(ORANGE COUNTY)

SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037054 JOHN J. COLOSKOSKI

February 11, 2015

SHEET TITLE: SITE PLAN & TOWER ELEVATION

SHEET NUMBER: C-1

REVISION: 2

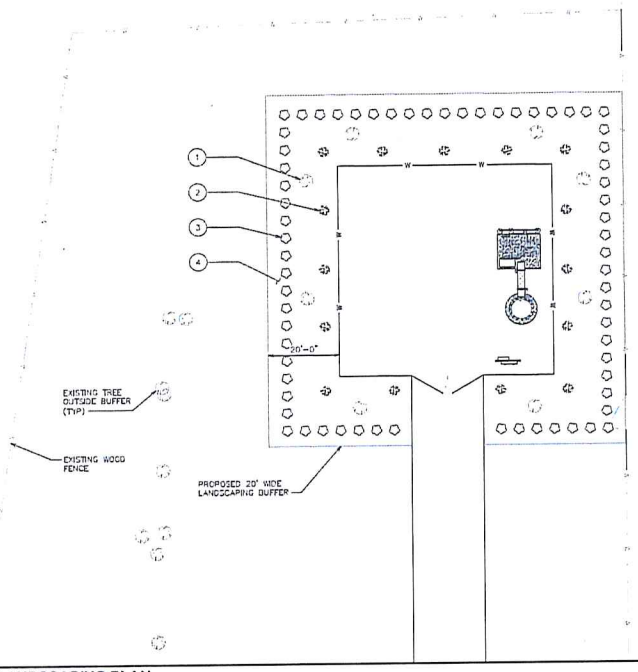
TEP # 85551

LANDSCAPE NOTES:

1. TOPSOIL TO BE PROVIDED BY SITE CONTRACTOR IN ROUGH GRADE TO WITHIN 1" OF FINISH GRADE.
2. EACH PLANT TO BE FREE FROM DISEASE, INSECT INFESTATION, AND MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR FIELD PLANTING.
3. ALL PLANTS TO BE FULLY GUARANTEED (LABOR AND MATERIALS) FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM DATE OF INSTALLATION.
4. ALL PLANTS SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1-1973 IN REGARD TO SIZING, GROWING, AND B&B SPECIFICATIONS.
5. THE CONTRACTOR SHALL PROTECT ALL EXISTING TREES AND SHRUBS WITHIN THE CONSTRUCTION AREA IDENTIFIED AS "TO REMAIN" FROM DAMAGE BY EQUIPMENT AND CONSTRUCTION ACTIVITIES.

PLANTING SCHEDULE

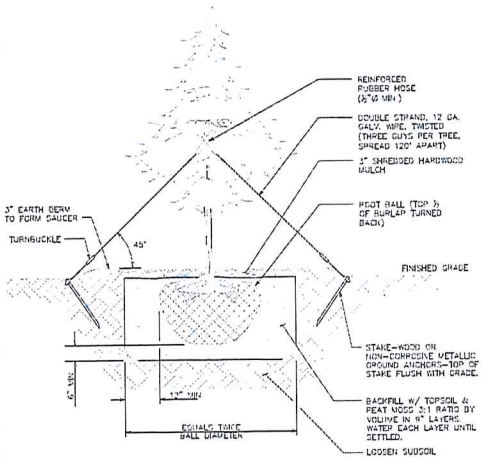
ITEM	QTY.	BOTANICAL NAME	COMMON NAME	HEIGHT @ PLANTING	HEIGHT @ 3 YRS.	SPREAD/ CALIPER	SPACING MIN/MAX	REMARKS
EVERGREEN TREE								
1	8	*(Pinus Palustris)*	LONGLEAF PINE	8'-0" (MIN)	–	N/A	40/100	SHOWN AS
EVERGREEN UNDERSTORY								
2	15	*(Cupressus Leylandii)*	LEYLAND CYPRESS	6'-0" (MIN)	–	N/A	10/30	SHOWN AS
SHRUBS								
3	67	*(Morella Cerifera)*	WAX MYRTLE	18" (MIN)	–	N/A	EVENLY	SHOWN AS
MULCH								
4	–	–	MULCH	–	–	–	–	APPLY 3"–4" DEEP WITHIN BUFFERYARD FOR GROUND COVER

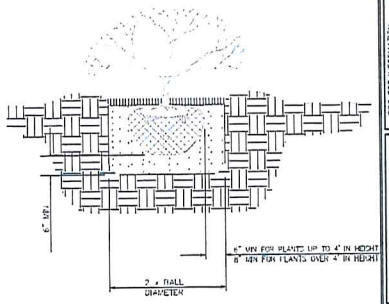


LANDSCAPING PLAN

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

0 16 32
SCALE IN FEET





LANDSCAPING DETAILS

SCALE: N.T.S.

PLANS PREPARED FOR:

T-Mobile

185 FAIRCHILD STREET
CHARLOTTE, NC 28203
OFFICE: (813) 216-1210

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603-5583
OFFICE: (919) 661-6351
FAX: (919) 661-6350
NC LICENSE # C-1734

REV	DATE	
2	02-11-15	CONSTRUCTION
1	01-23-15	PRELIMINARY
0	01-23-15	PRELIMINARY

ISSUED FOR:

DRAWN BY: CMH | CHECKED BY: JJC

PROJECT INFORMATION:

ERWIN ROAD
TMO ID: 5RA0532D
SKYWAY SITE #: NC-08828

5022 KERLEY ROAD
DURHAM, NC 27705
(ORANGE COUNTY)

SEAL:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037306 JOHN J. CORCORAN

February 11, 2015

SHEET TITLE: LANDSCAPING PLAN & DETAILS

SHEET NUMBER: C-3

REVISION: 2

TEP # 8945-1

BALLOON PHOTO PRESENTATION

Skyway Towers

Wireless Communications Facility Balloon Tether Documentation

Proposed 125.0'agl Telecommunications Facility is to be located at or near 5022 Kerley Rd, Durham, NC 27705, Orange County. The site coordinates are N 35° 59' 26.84" W 78° 59' 42.52". The site elevation is approximately 372.89 ft AMSL. The Balloon is 3.50' in diameter and 10.0' in length and holds 90 cubic feet of helium. The balloon as pictured is tethered at One Hundred and Twenty-Five Feet (125 feet in height/altitude) above ground, at the centerline of the proposed tower facility location. The pictures that follow are taken with a 16.0 mega pixel digital camera with the lens set at 5.0mm to represent a "normal view" that is representative of what a person would see at ground level if viewing the balloon at similar and representative distances.*

The photography for this documentation was shot between the hours of 10:00AM and 2:00PM on April 11, 2015. The winds during this time were about 5mph (N); "calm". The blimp was stable and vertical over the proposed centerline. Attached are wind graphs that depict actual conditions during the blimp tether.

**Note: Some of the photography of the balloon is "zoomed" to depict the balloon in place where necessary, when the subject balloon is not visible on the 5.0mm lens setting. Zoom range is 5.0mm to 25mm optical.*

GRAHAM HERRING COMMERCIAL REAL ESTATE GRAPHIC SERVICES
PROVIDING PROFESSIONAL SPECIALTY SERVICES TO THE TELECOMMUNICATIONS INDUSTRY

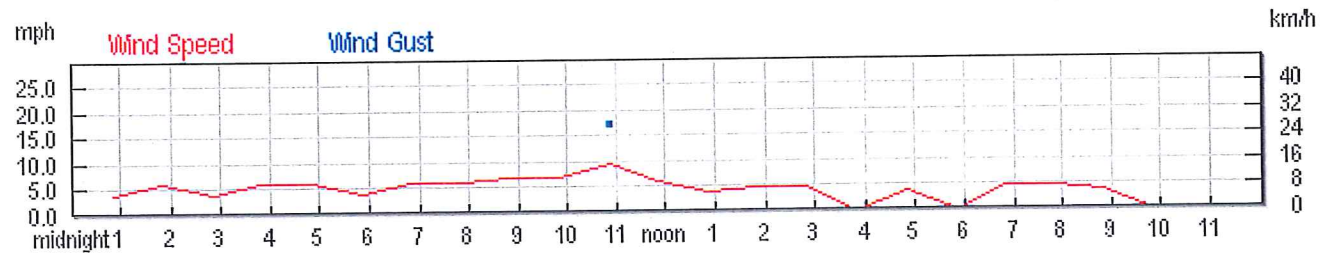
The photography for this documentation was shot between the hours of 10:00AM and 2:00PM. The winds during this time were about 5mph (N). The balloon was stable and vertical over the proposed centerline. Below are wind charts that depict the wind direction and speed during the balloon tether.

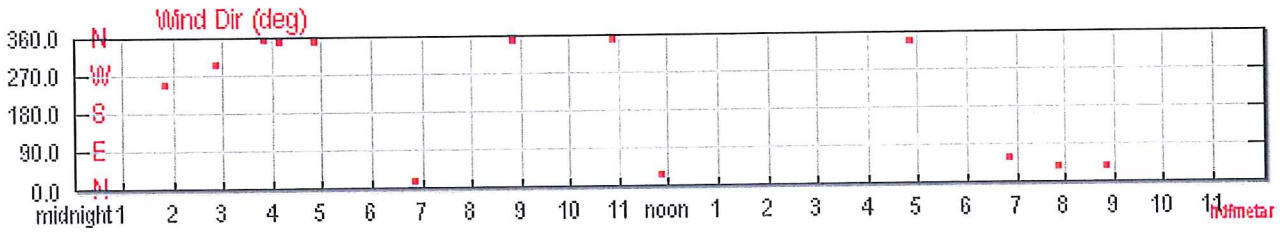
WEATHER HISTORY FOR KRDU

Nearest airport to Durham, NC
Saturday, April 11, 2015

	Actual	Average	Record
Mean Temperature	64 °F	59 °F	
Max Temperature	75 °F	71 °F	90 °F (1930)
Min Temperature	52 °F	47 °F	27 °F (1960)
Dew Point	44 °F		
Average Humidity	48		
Maximum Humidity	68		
Minimum Humidity	27		
Precipitation	0.00 in	0.10 in	1.91 in (1944)
Sea Level Pressure	30.07 in		
Wind Speed	4 mph (North)		
Max Wind Speed	13 mph		
Max Gust Speed	20 mph		
Visibility	10 miles		
Events			

T = Trace of Precipitation, MM = Missing Value Source: NWS Daily Summary



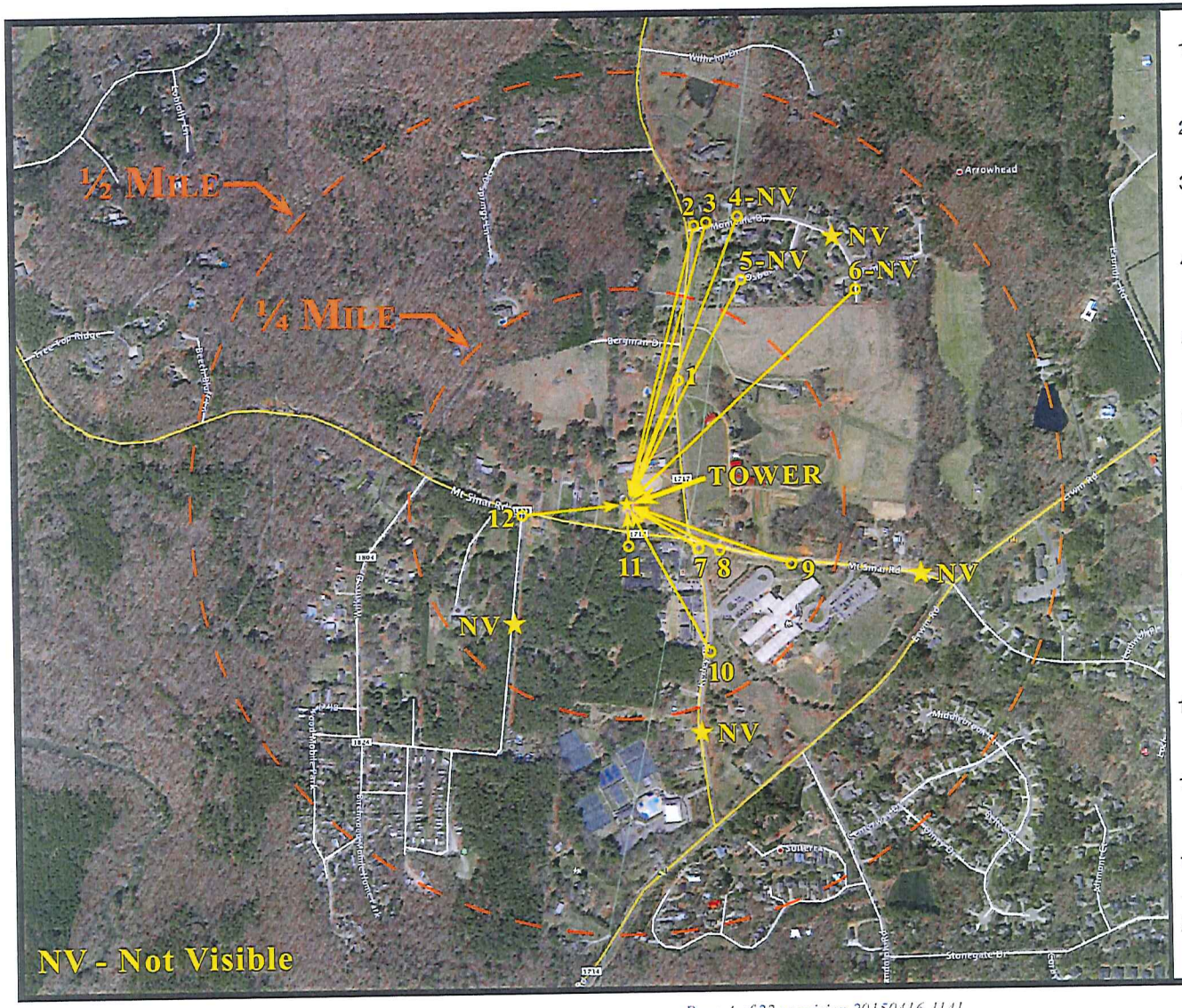


SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC



1 - Looking south by southwest towards site from Kerley Rd south of Bergman Rd. (0.16mi)

2 - Looking south by southwest towards site from Montvale Dr at Kerley Rd. (0.33mi)

3 - Looking south by southwest towards site from Montvale Dr west of Osborne Pl. (0.34mi)

4 - **Not Visible.** Looking south by southwest towards site from Montvale Dr west of Osborne Pl. (0.36mi)

5 - **Not Visible.** Looking south by southwest towards site from the end of Osborne Pl. (0.29mi)

6 - **Not Visible.** Looking southwest towards site from Montvale Dr east of Bancroft Dr. (0.36mi)

7 - Looking west by northwest towards site across Kerley Rd at Mt Sinai Rd. (513ft, 0.10mi)

8 - Looking west by northwest towards site from Mt Sinai Rd east of Kerley Rd. (0.12mi)

9 - Looking west by northwest towards site from Mt Sinai Rd east of Kerley Rd. (0.20mi)

10 - Looking north by northwest towards site from Kerley Rd south of Forest View Elementary School. (0.20mi)

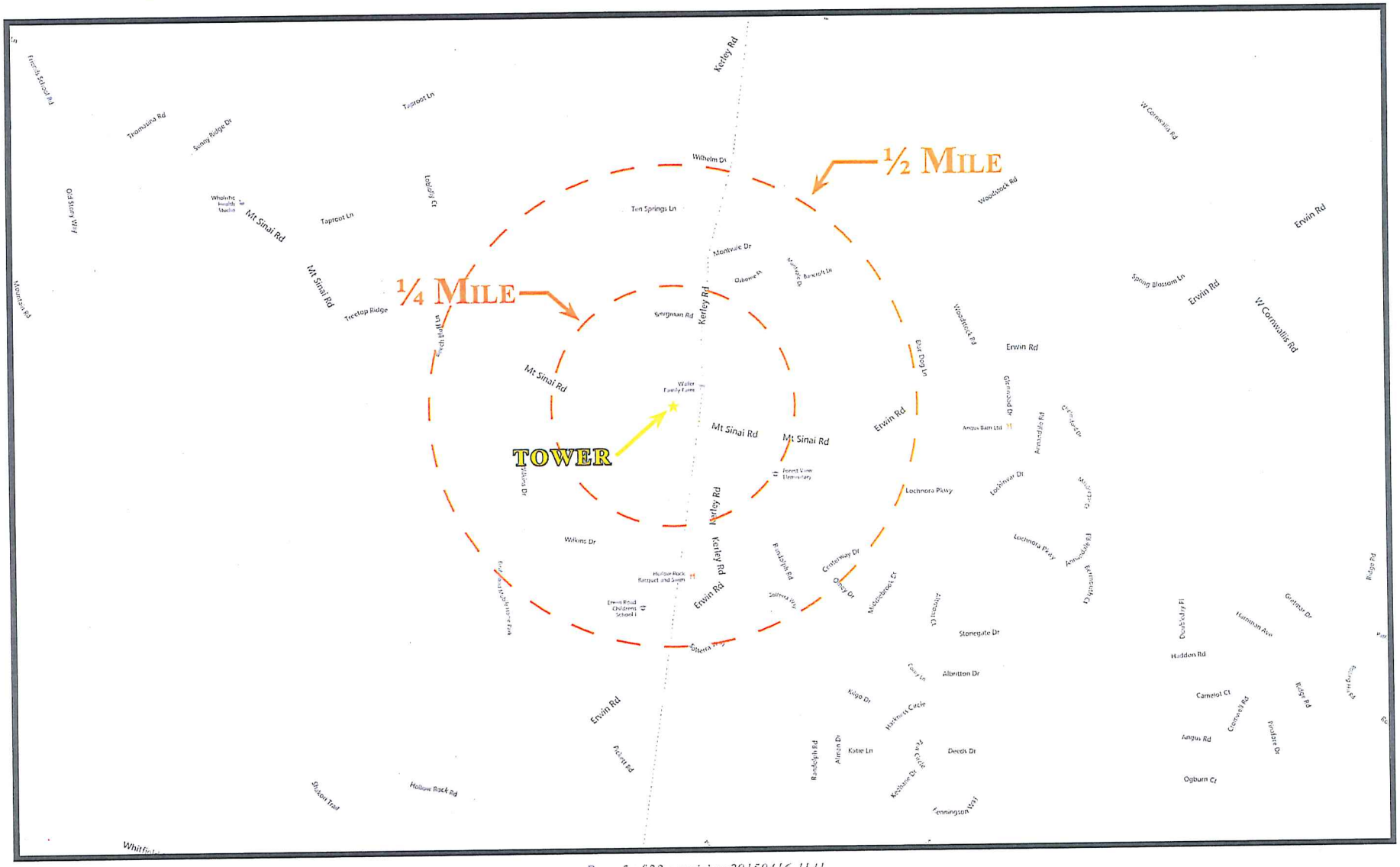
11 - Looking north towards site across Mt Sinai Rd from rear of UniHealth Post Acute Care-Carolina Point. (257ft, 0.05mi)

12 - Looking east by northeast towards site from Mt Sinai Rd at Wilkins Dr. (0.12mi)

NV = Not Visible

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC



SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 1

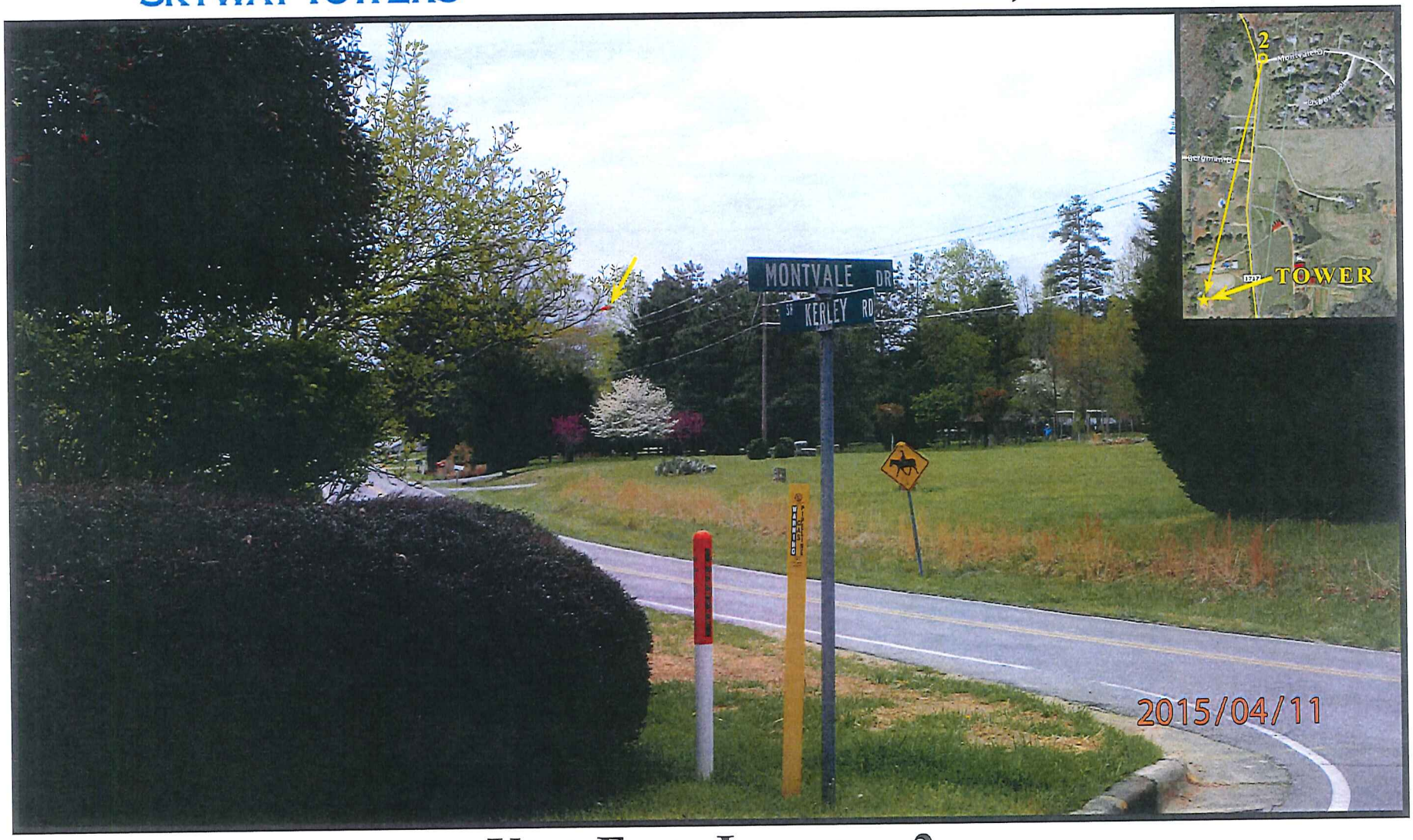
SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SIMULATED VIEW FROM LOCATION 1

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC



VIEW FROM LOCATION 2

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 3

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 4

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 5

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 6

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 7

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SIMULATED VIEW FROM LOCATION 7

SKYWAY TOWERS

SKYWAY SITE # NC-08828
PIN # 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 8

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SIMULATED VIEW FROM LOCATION 8

SKYWAY TOWERS

SKYWAY SITE # NC-08828
PIN # 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 9

SKYWAY TOWERS

SKYWAY SITE # NC-08828
PIN # 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 10

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SIMULATED VIEW FROM LOCATION 10

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 11

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

SIMULATED VIEW FROM LOCATION 11

SKYWAY TOWERS

SKYWAY SITE# NC-08828
PIN# 0801154533
ERWIN ROAD, DURHAM, NC

VIEW FROM LOCATION 12

SKYWAY TOWERS

Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

Statement Regarding Co-Location Options
Pursuant to Section 5.10.8(B)(3)(d)

T-Mobile is currently in the process of expanding its coverage in the Orange/Durham County area. The proposed tower site at 5022 Kerley Road ("Proposed Tower") will provide coverage to Mt. Sinai Road, Erwin Road, Kerley Road and surrounding areas where T-Mobile does not currently have coverage. T-Mobile engaged Skyway Towers to find a site within the ½ mile radius search ring shown on Exhibit A that would meet T-Mobile's objectives. The search ring was developed by T-Mobile to indicate where it needs a tower in order for it to locate its antennas so that they will function as intended to meet its objectives for this location. As always, Skyway Towers investigated existing towers, buildings, and other useable structures within the search ring and found that none were suitable to meet T-Mobile's objectives.

Pursuant to Section 5.10.8(B)(3)(d)(i), Exhibit B is a list of all wireless telecommunications support structures within a two mile radius of the proposed tower site. There are two existing towers, one at 4900 Cornwallis Drive in Orange County and one at 5266 Kerley Road in Durham County. The one at 4900 Cornwallis Drive is 1.8 miles away from the proposed tower location and well outside the search ring. Because it is well outside the search ring, locating T-Mobile's antennas on this tower will not meet T-Mobile's objective for this site.

The existing tower at 5266 Kerley Road in Durham County is owned by American Tower. This tower is a 115 foot monopine tower and is located to the southeast of the Proposed Tower. T-Mobile's RF engineers examined this site and determined that it would not meet T-Mobile's objectives for this site. Specifically, the highest available location for T-Mobile's antennas on the American Tower monopine is 105 feet. The American Tower monopine is located on property that is 330 feet AMSL (Above Mean Sea Level) at ground level. The proposed 125 foot monopole tower provides T-Mobile with an antenna height of 120 feet (based upon the centerline of the antennas), and the property on which the Skyway Towers monopole will be located is 372.89 AMSL, 42.89 feet higher, at ground level. Adding the 42.89 feet increase in ground level and the 15 feet in additional antenna height, the Skyway Towers monopole offers T-Mobile 57.89 feet of additional height which is consistent with T-Mobile's height requirement to achieve its coverage objective.

Attached are propagation maps to help illustrate this point. The propagation maps show T-Mobile's current coverage in the area as compared to coverage with the Proposed Tower. The goal is to provide enough of the darker green colors to connect with T-Mobile's existing locations in the area. The current coverage map on slide 2 only has scattered lighter green (the

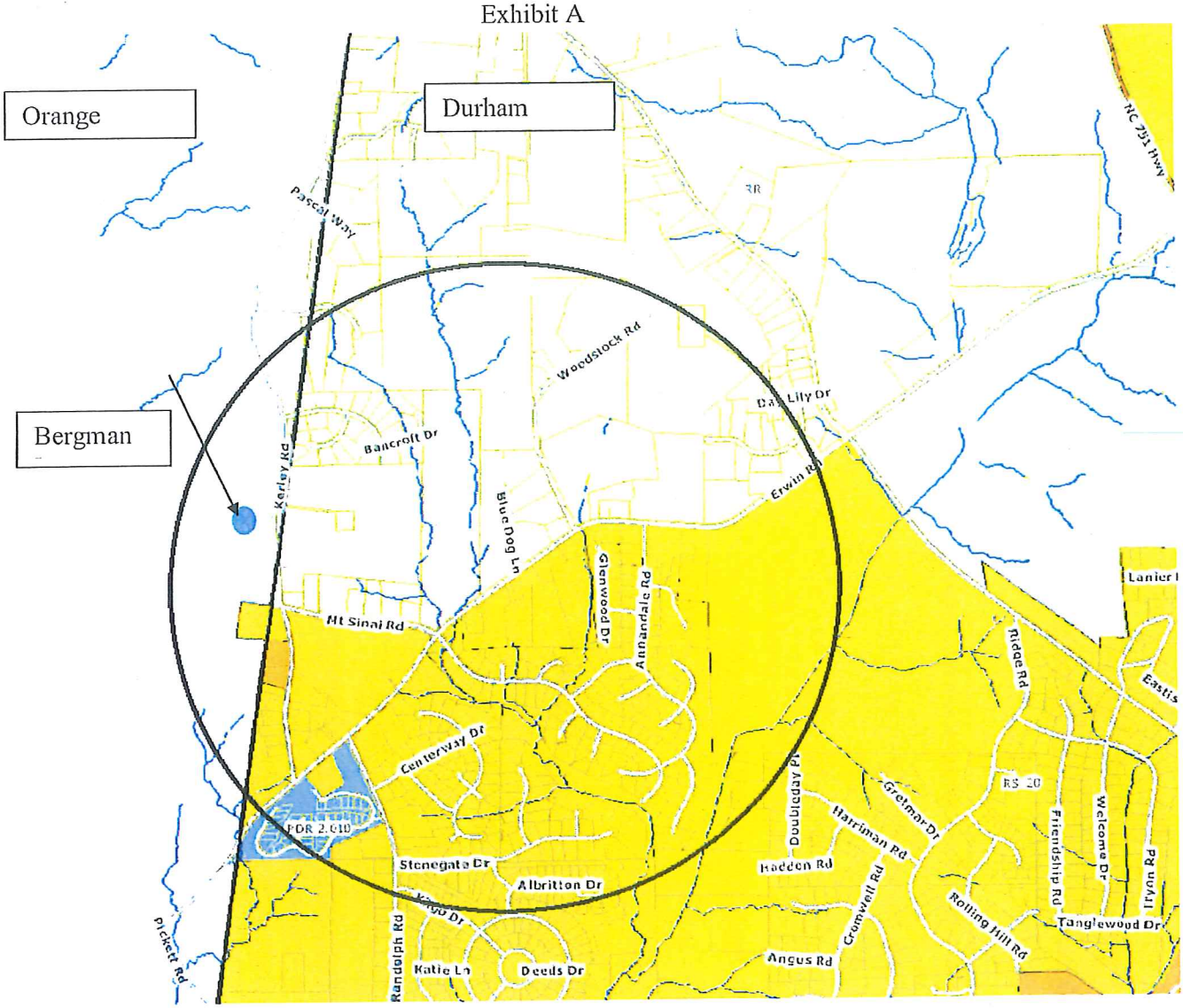
darker the better) and white space, which means no effective coverage. Slide 3 shows the coverage if the Proposed Tower is approved. This map shows this hole in coverage will be remedied with the Proposed Tower at 120 feet.

Slide 4 shows the coverage if T-Mobile located on the American Tower monopine. As this slide shows, the coverage area shrinks significantly and creates an area of weaker coverage between the American Tower site and T-Mobile's existing sites to the east resulting in continued poor coverage. Coverage from the Proposed Tower significantly improves around the Proposed Tower and to the west and northwest as compared to coverage from the American Tower site.

Date: 4/23/15

Justin Jones
Project Manager
Skyway Towers

Exhibit A



NPRAL1:503530.1

EXHIBIT B

LIST OF TELECOMMUNICATION TOWERS WITHIN 2 MILE RADIUS PER ANTENNA STRUCTURE REGISTRATION SEARCH

Registration #	Address	Status	Construction Date	File Number	Owner Name	Latitude/Longitude	City/State	AGL (Feet)
1004862	4900 Cornwallis Dr.	Constructed	5/11/92	A0846145	ALLTEL	36-00-54.3N 079-00-15.3W	Durham, NC	314' 11 17/32"
1281101	5266 Kerley Rd.	Constructed	12/11/2009	A0740376	American Towers, LLC	35-59-15.3N 078-59-40.0W	Durham, NC	121' 0 3/4"

T-Mobile

Coverage Analysis

5RA0532

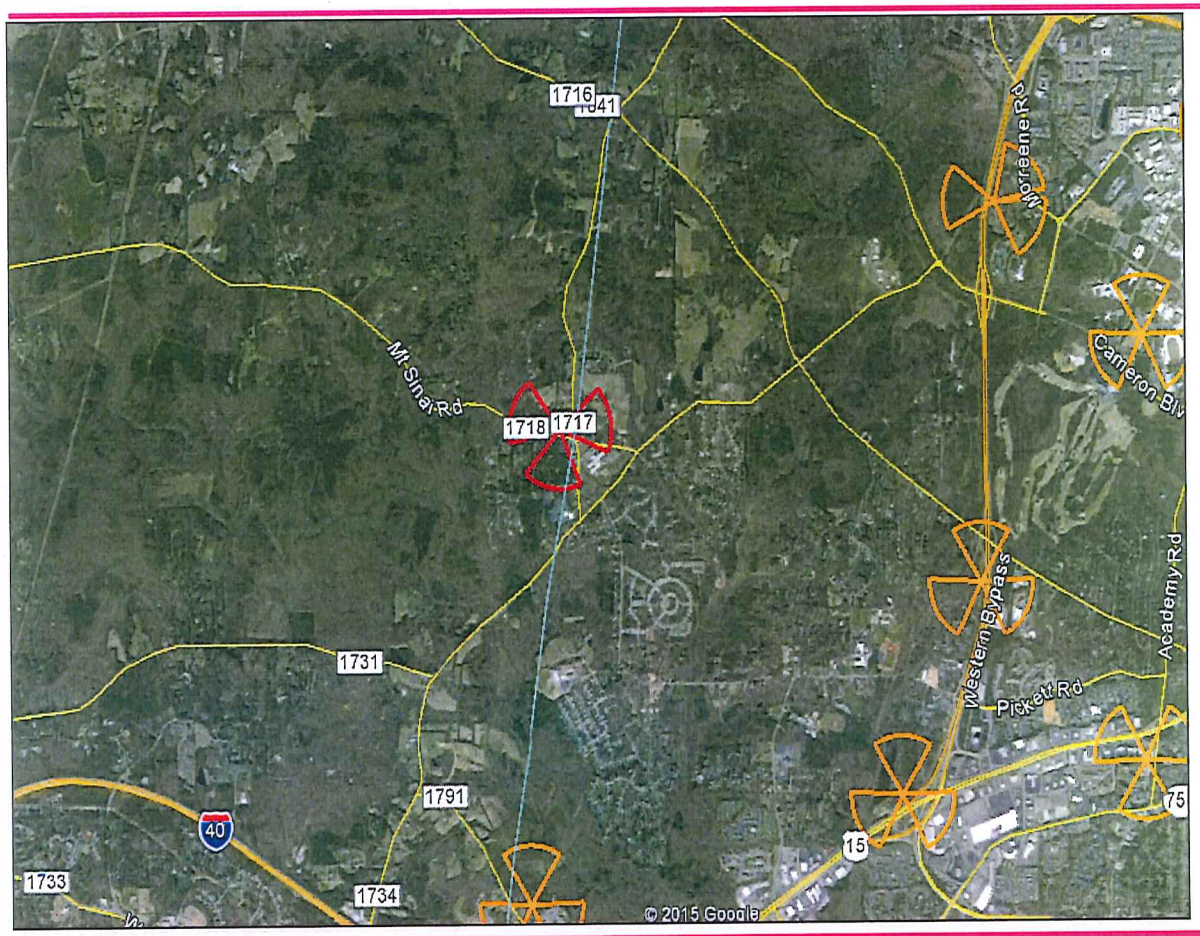
NSD– Carolinas Market

April 14, 2015

FES
Further Enterprise Solutions

T-Mobile

5RA0532 Overview



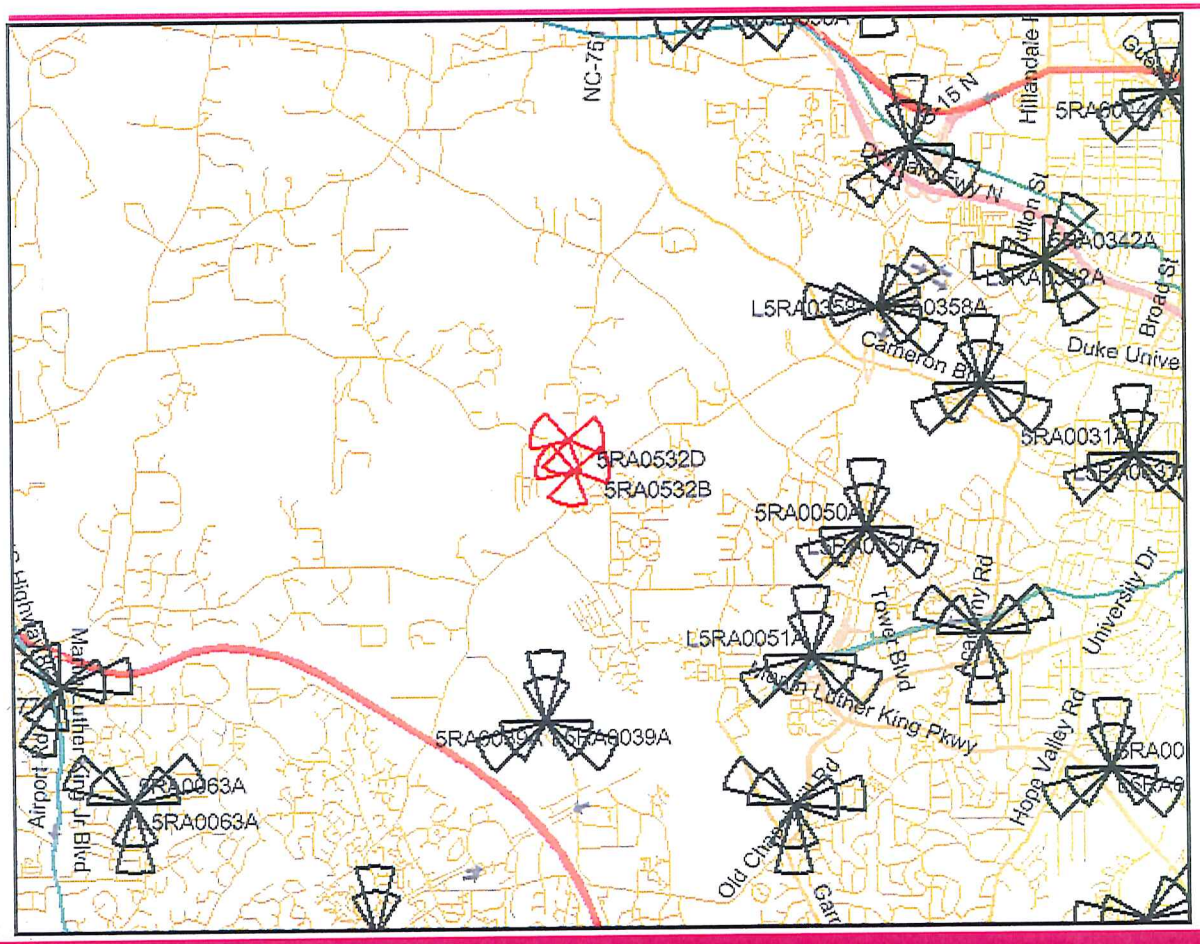
Coverage Objective

The primary objective of this site is to improve coverage in residential an commercial areas around the intersection of Erwin Rd and Mt Sinai.

T-Mobile Confidential

T-Mobile

5RA0532 Overview



	On Air
	Candidate

B	Collocation	ATC
D	Raw Land	Bergman

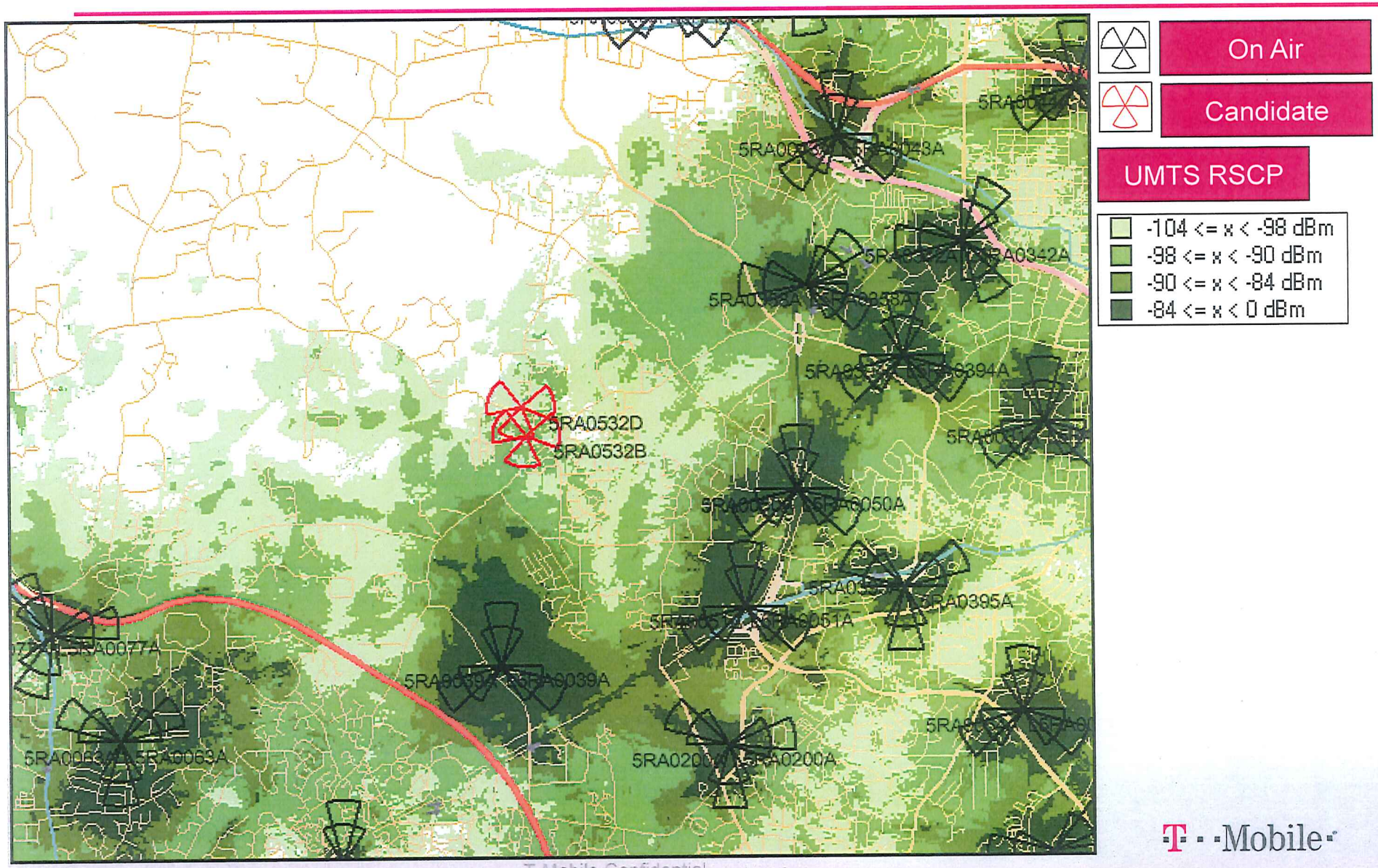
Coverage Objective

The primary objective of this site is to improve coverage in residential an commercial areas around the intersection of Erwin Rd and Mt Sinai.

T-Mobile Confidential

T-Mobile

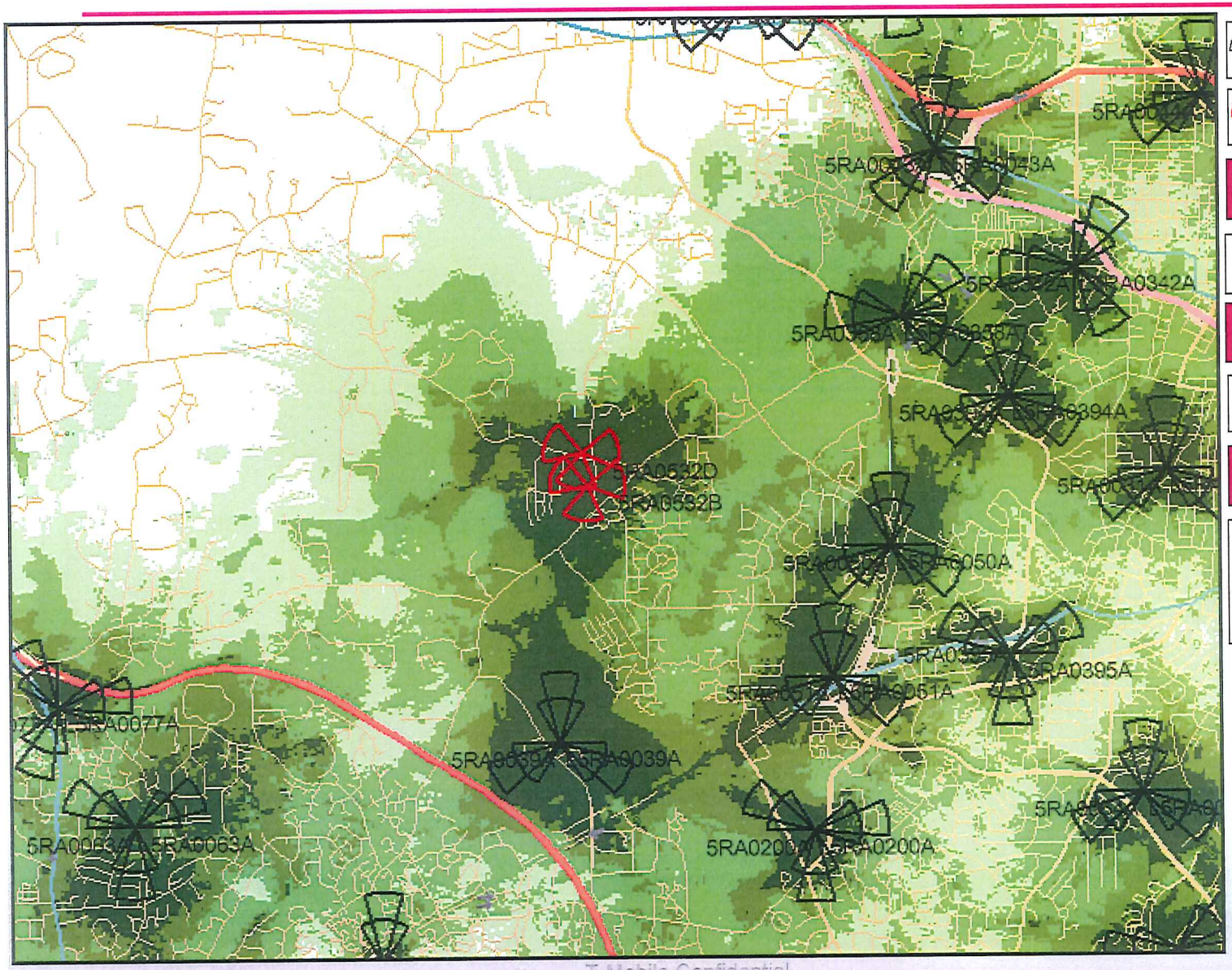
5RA0532 RSCP Before Candidate



T-Mobile

T-Mobile Confidential

5RA0532D – RSCP After Candidate



On Air

Candidate

Height

120 feet

Azimuth

80-190-290

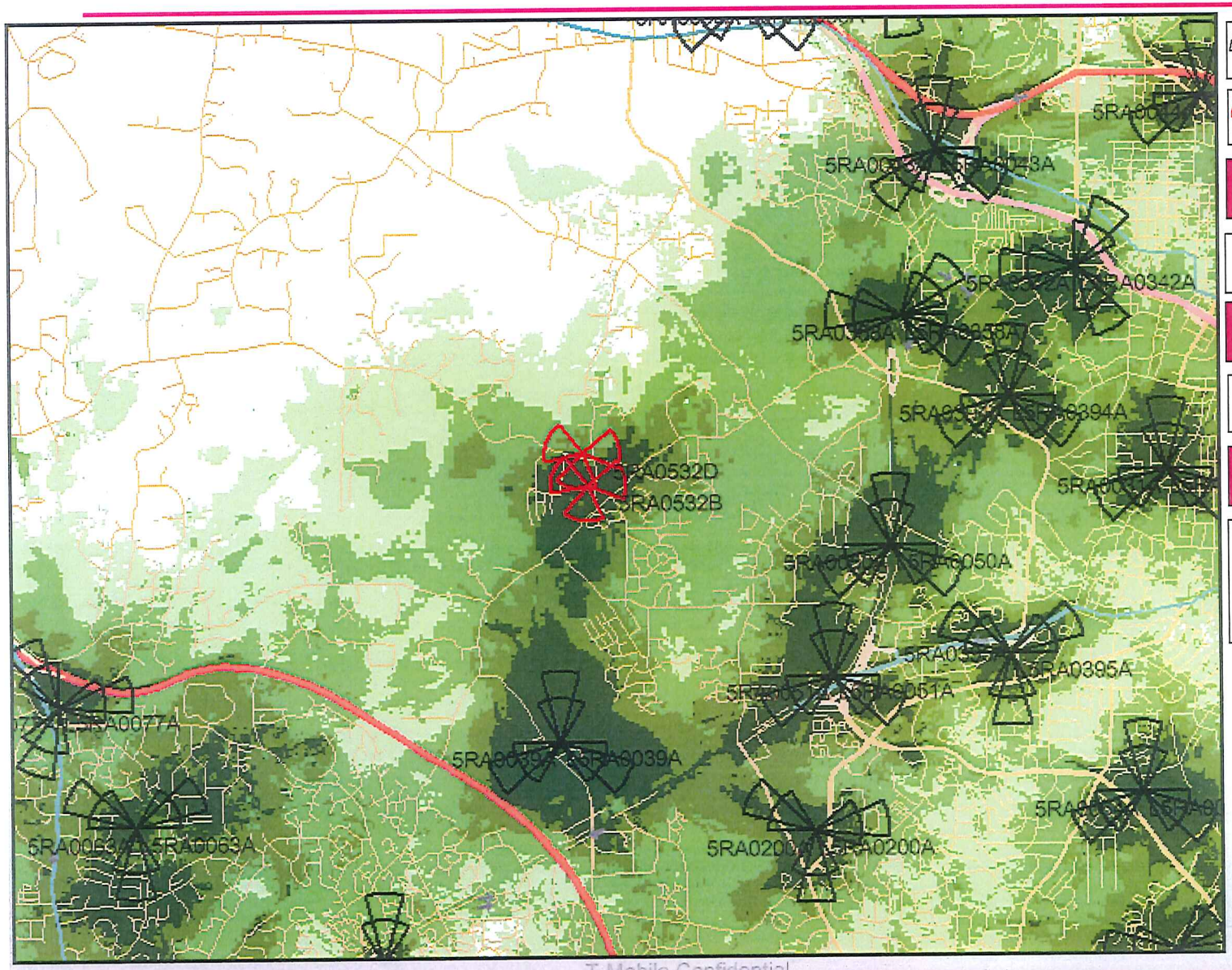
UMTS RSCP

- -104 <= x < -98 dBm
- -98 <= x < -90 dBm
- -90 <= x < -84 dBm
- -84 <= x < 0 dBm

T-Mobile

T-Mobile Confidential

5RA0532B (ATC) – RSCP After Candidate



On Air

Candidate

Height

105 feet

Azimuth

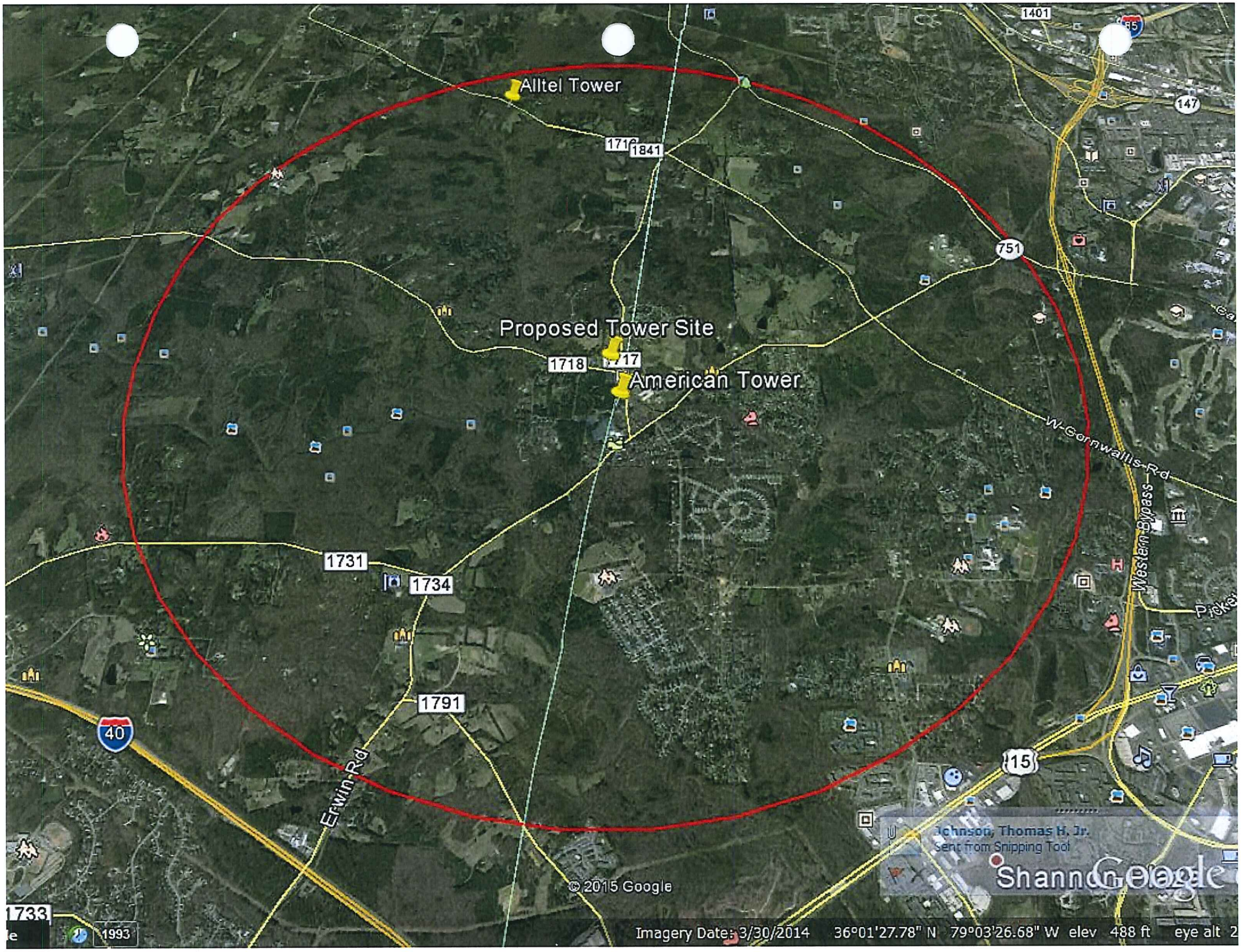
80-190-290

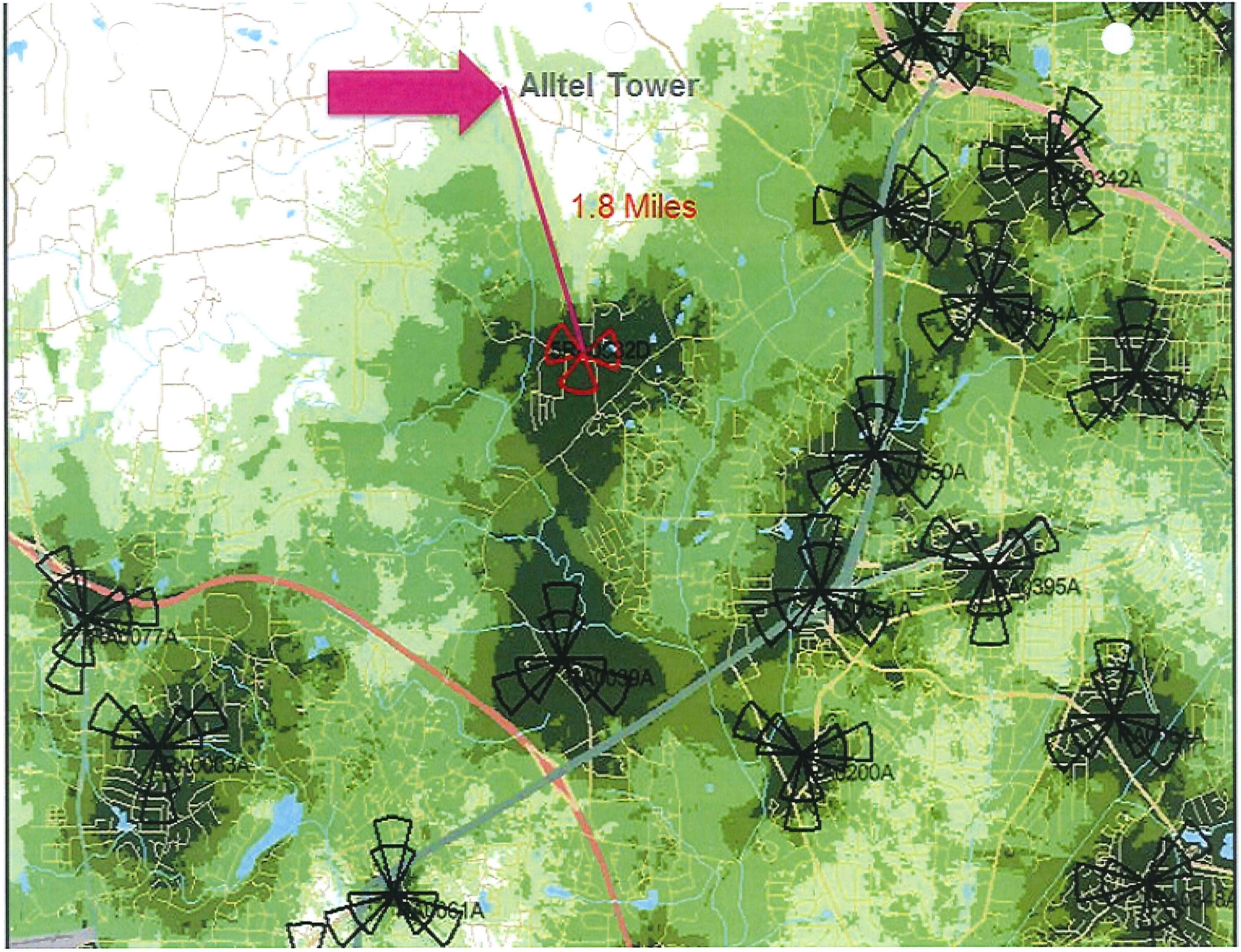
UMTS RSCP

- -104 <= x < -98 dBm
- -98 <= x < -90 dBm
- -90 <= x < -84 dBm
- -84 <= x < 0 dBm

T-Mobile

T-Mobile Confidential


Alltel Tower
Proposed Tower Site
American Tower
1401
147
1841
751
1718
1731
1734
1791
40
115
W Cornwallis Rd
Western Bypass
Erwin Rd
Johnson, Thomas H. Jr.
Sent from Snipping Tool
© 2015 Google
Imagery Date: 3/30/2014 36°01'27.78" N 79°03'26.68" W elev 488 ft eye alt 2


Alltel Tower
1.8 Miles

USAmeriBank

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER

DATE: MARCH 25, 2015

APPLICANT: SKYWAY TOWERS, LLC, A DELAWARE LIMITED LIABILITY COMPANY
20525 AMBERFIELD DR STE 102
LAND O'LAKES, FL 34638

BENEFICIARY: ORANGE COUNTY, A NORTH CAROLINA MUNICIPALITY

AMOUNT: U.S. $75,000.00

EXPIRATION DATE: MARCH 24, 2016

RE: LETTER OF CREDIT ISSUED FOR THE ACCOUNT OF APPLICANT, SKYWAY TOWERS, LLC ("SKYWAY TOWERS"), PURSUANT TO DURHAM COUNTY UNIFIED DEVELOPMENT ORDINANCE (N.C.) § 5.10.8 (B) (5) A-B (2014) , IN REGARDS TO GRANT OF SPECIAL USE PERMIT TO GUARANTEE REMOVAL OF THE WIRELESS TELECOMMUNICATIONS FACILITIES, PERFORMANCE OF THE TERMS AND CONDITIONS OR THE ORDINANCE AND TO RESTORE THE SITE TO A CONDITION COMPARABLE TO THAT, WHICH EXISTED PRIOR TO THE ISSUANCE OF THE ORIGINAL SPECIAL PERMIT FOR THE SITE NC-08828 ERWIN ROAD LOCATED AT 5022 KERLEY ROAD, DURHAM, NC 27705 IN THE COUNTY OF ORANGE.

USAMERIBANK, LOCATED AT 4790 140TH AVENUE NORTH, CLEARWATER, FL 33762, HEREBY ADVISES YOU THAT IT HAS ESTABLISHED THIS IRREVOCABLE LETTER OF CREDIT IN FAVOR OF ORANGE COUNTY, A NORTH CAROLINA MUNICIPALITY. PAYMENTS UNDER THIS LETTER OF CREDIT WILL BE MADE TO YOU UPON PRESENTATION AT OUR OFFICE LISTED ABOVE ON OR BEFORE THE THEN EXPIRATION DATE (SUBJECT TO THE TERMS HEREOF) OF THE FOLLOWING DOCUMENTS, ACCOMPANIED BY THIS ORIGINAL LETTER OF CREDIT ALONG WITH ITS AMENDMENTS, IF ANY:

1. SIGHT DRAFT DRAWN ON USAMERIBANK FOR THE AMOUNT OF PAYMENT CLAIMED, BEARING THE CLAUSE "DRAWN UNDER USAMERIBANK LETTER OF CREDIT # AND STATING THAT SKYWAY TOWERS HAS FAILED TO REMOVE AND DISPOSE OF ITS WIRELESS TELECOMMUNICATIONS FACILITY LOCATED AT THE ABOVE REFERENCED PROPERTY AFTER THE FACILITY HAS BECOME ABANDONED, AND IN THE AMOUNT DEMANDED AS RESULT OF SUCH FAILURE.

2. A SIGNED AND DATED STATEMENT PURPORTEDLY FROM ORANGE COUNTY, A NORTH CAROLINA MUNICIPALITY DIRECTOR (OR A PURPORTED AUTHORIZED REPRESENTATIVE THEREOF) THAT (A) SKYWAY TOWERS HAS BEEN NOTIFIED IN WRITING OF ITS FAILURE TO MEET ITS OBLIGATION TO REMOVE AND DISPOSE OF SAID FACILITY, AS DETERMINED BY ORANGE COUNTY, AND (B) DURING THE 30-DAY PERIOD FOLLOWING SKYWAY

TOWERS' RECEIPT OF SUCH NOTICE, SKYWAY TOWERS HAS FAILED TO CORRECT SUCH FAILURE OR, IF CURE IS NOT POSSIBLE WITHIN 30 DAYS, HAS FAILED TO COMMENCE ITS EFFORTS TO CURE OR HAS FAILED TO PURSUE A CURE DILIGENTLY, OR (C) ORANGE COUNTY HAS RECEIVED A 30-DAY NOTICE [AS DEFINED BELOW] WITHOUT REMOVAL OF THE TELECOMMUNICATIONS FACILITY BY SKYWAY TOWERS, OR RECEIPT BY PERFORMANCE SECURITY.

DRAFTS AGAINST THIS LETTER OF CREDIT ARE NOT SUBJECT TO ANY CONDITIONS OR QUALIFICATIONS OUTSIDE THE TERMS SET FORTH HEREIN, AND DO NOT INCORPORATE BY REFERENCE ANY OTHER AGREEMENTS OR DOCUMENTS.

THE TOTAL AMOUNT PAYABLE UNDER THIS LETTER OF CREDIT SHALL BE SEVENTY-FIVE THOUSAND AND 00/100THS U.S. DOLLARS ($75,000.00) AND IS VALID UNTIL MARCH 24, 2016. IT IS A CONDITION OF THIS LETTER OF CREDIT THAT IT SHALL BE DEEMED AUTOMATICALLY EXTENDED WITHOUT AMENDMENT FOR ONE YEAR FROM THE EXPIRATION DATE HEREOF AND FOR ONE YEAR FROM EACH FUTURE EXPIRATION DATE, UNLESS AT LEAST 30 DAYS PRIOR TO THE STATED EXPIRATION DATE (AS THE SAME MAY HAVE BEEN EXTENDED) WE SHALL NOTIFY YOU BY CERTIFIED MAIL RETURN RECEIPT REQUESTED, OR COURIER MAIL, THAT WE ELECT NOT TO EXTEND THIS LETTER OF CREDIT (THE "30-DAY NOTICE"). YOU MAY INFORM US FROM TIME TO TIME AS TO ANY CHANGE IN THE ADDRESS TO WHICH SUCH NOTICE SHOULD BE SENT.

PARTIAL DRAWINGS ARE ALLOWED AND THIS LETTER OF CREDIT IS NOT TRANSFERABLE.

THIS LETTER OF CREDIT WILL BE SUBJECT TO INTERNATIONAL STANDBY PRACTICES 1998, AND TO THE EXTENT NOT INCONSISTENT THEREWITH, THE LAWS OF THE STATE OF FLORIDA, UNLESS OTHERWISE PROVIDED.

VERY TRULY YOURS,

USAMERIBANK

BY:_____
PRINT NAME:_____
TITLE:_____

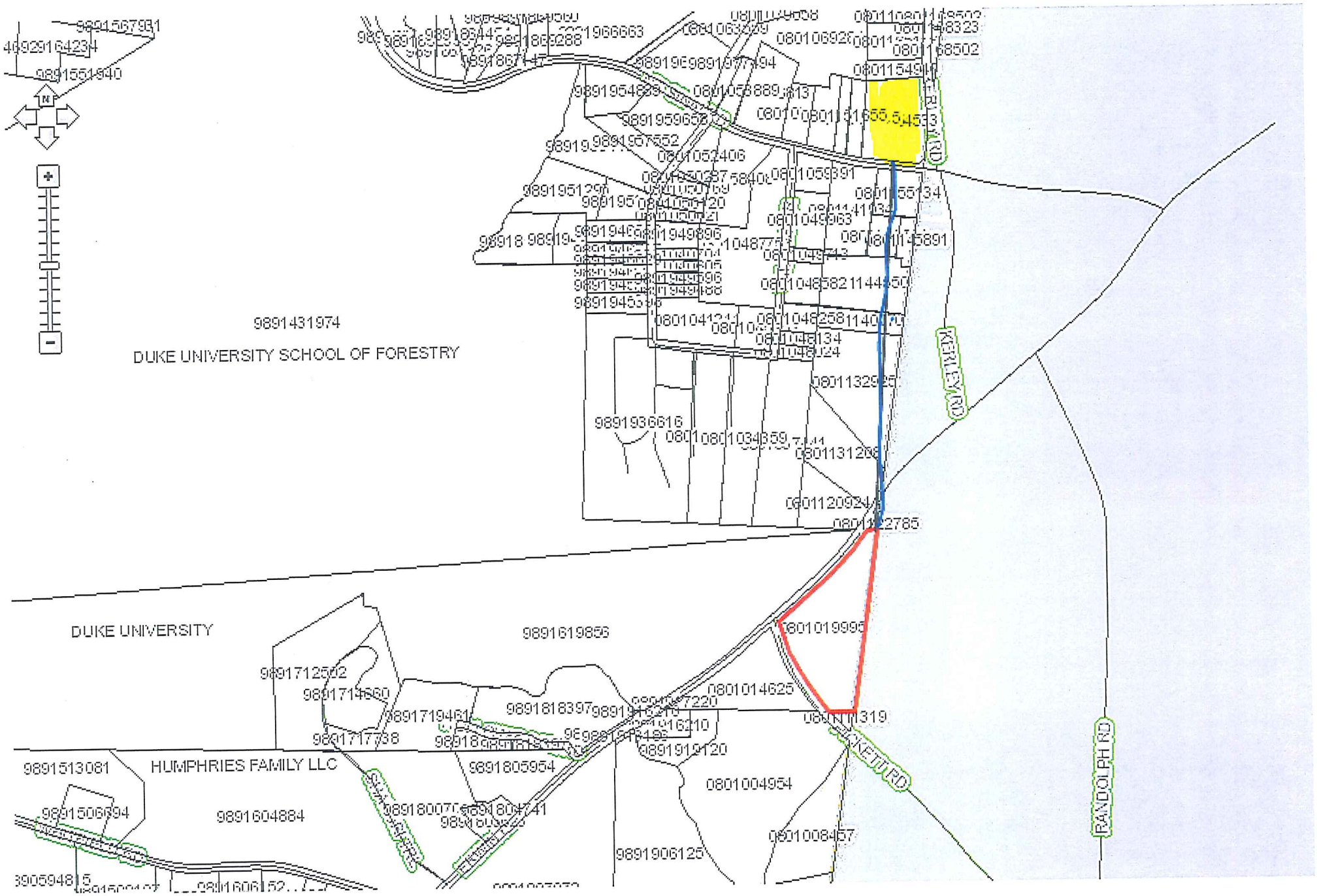
Site Name: Erwin Road
Site Address: 5022 Kerley Road, Durham, NC 27705

Location of Wireless Support Structures
Section 5.10.8 (B) (4) (b) (i), (ii), (iii)

There are no county-owned facilities or property within the search ring. The closest county owned property is near the intersection of Erwin Road and Pickett Road (see attached map). That property is outside the search ring. Also, NCGS § 153A-349.52(h) provides that "The county may not require the placement of wireless support structures or wireless facilities on county owned or leased property, but may develop a process to encourage the placement of wireless support structures or facilities on county owned or leased property, including an expedited approval process."

Analysis of the use of existing facilities is contained in the response to the requirements of Section 5.10.8(B)(3)(d).

The only available properties within the search ring are zoned residential.


9891431974
DUKE UNIVERSITY SCHOOL OF FORESTRY
DUKE UNIVERSITY
HUMPHRIES FAMILY LLC
KERLEY RD
RANDOLPH RD

Skyway Towers Collocation Application

SKYWAY TOWERS

Installation Type: Anchor ☑ Collocation ☐

RETURN THIS APPLICATION TO: (E-MAIL IS PREFERRED)
Skyway Towers
Contact: Lesley Cordileone 813-503-2333
E-mail: Collo@skywaytowers.com
Office: 813-960-6200
Fax: 813-960-6210

Date Received :
Revision Dates:

Skyway Site Name: Erwin
Skyway Site # NC-08828

APPLICANT INFORMATION

Applicant (Carrier):	T-Mobile South LLC	Primary Contact Name:	Robert Hill
Applicant Site Name:		Company Name:	T-Mobile South LLC
Applicant Site Number:	5RA0532D	Primary Contact Number:	843-216-4301
Req. Date For Receipt of Tenant Lease:		Primary Contact Fax:	843-216-4347
Proposed Installation Date:			
Proposed ON AIR Date:			
Applicant Entity Name on SA:	T-Mobile USA, Inc.	Primary Contact Address:	185 Fairchild Street
Notice Address for License:	Attn. Lease Compliance Site No. 5RA0532D		Charleston, SC 29492
Billing Address:	12920 SE 38th Street Bellevue, WA 98006	Primary Contact Email:	robert.hill@t-mobile.com

ADDITIONAL CARRIER INFORMATION

Leasing Contact Name/Number:	Robert Hill / 843-216-4301
RF Contact Name/Number:	
Legal Review Contact Name/Number:	Lois Duran / 972-464-3067
Zoning Contact Name/Number	
Construction Contact Name/Number:	
Emergency Contact Name/Number:	877-611-5868
Accounts Payable Contact (Required):	Name: Number: e-mail: Address: City: State: Zip:

SKYWAY TOWERS - TOWER INFORMATION

Latitude:	35	59	26.84	N	Existing Structure Type:	
Longitude:	78	59	42.52	W	Tower Height:	
AMSL:	372.89				Available RAD's as of:	
Site Address:	5022 Kerly Rd, Durham, NC 27705				County	Durham

** NOTE: Applicant or their Contractor are required within 30 days of installation to submit a closeout package to Skyway Towers

EQUIPMENT SPECIFICATIONS

Sector	Sector 1	Sector 2	Sector 3	Sector 4	AUX
Desired RAD Center (ft AGL)	120	120	120	N/A	N/A
Antenna Quantity (PER SECTOR)	1	1	1	N/A	N/A
Antenna Manufacturer	AIR21 B4A B2P	AIR21 B4A B2P	AIR21 B4A B2P	N/A	N/A
Antenna Model (Attach Spec Sheet)	Ericsson	Ericsson	Ericsson	N/A	N/A
Weight (lbs per antenna)	90.3 lbs	90.3 lbs	90.3 lbs	N/A	N/A
Antenna Dimensions (HxWxD) (in)	55.98" x 12.08" x 7.87"	55.98" x 12.08" x 7.87"	55.98" x 12.08" x 7.87"	N/A	N/A
ERP (watts)	see spec sheet	see spec sheet	see spec sheet	N/A	N/A
Antenna Gain (dB)	see spec sheet	see spec sheet	see spec sheet	N/A	N/A
Orientation/Azimuth (Degrees)	80	190	290	N/A	N/A
Mechanical Tilt (Attach Spec Sheet)	2	2	2	N/A	N/A
TMA/RRU Quantity	1 RRU/ 1 COVP	1 RRU/ 1 COVP	1 RRU/ 1 COVP	N/A	N/A
TMA/RRU Manufacturer & Model (Attach Specs)	RRU11 B2	S11 B2	S11 B2	N/A	N/A
TMA/RRU Dimensions (HxWxD) (in)	19.68" x 16.9"x7.1"	19.68" x 16.9"x7.1"	19.68" x 16.9"x7.1"	N/A	N/A
TMA/RRU Weight	50.7 lbs	50.7 lbs	50.7 lbs	N/A	N/A
Diplexer Quantity	N/A	N/A	N/A	N/A	N/A
Diplexer Manufacturer & Model	N/A	N/A	N/A	N/A	N/A
Diplexer Dimensions (HxWxD)	N/A	N/A	N/A	N/A	N/A
RET Quantity	N/A	N/A	N/A	N/A	N/A
RET Manufacturer & Model	N/A	N/A	N/A	N/A	N/A
RET Dimensions (HxWxD)	N/A	N/A	N/A	N/A	N/A
RET Cable Quantity	N/A	N/A	N/A	N/A	N/A
Diameter of RET Control Cable	N/A	N/A	N/A	N/A	N/A
ODU Quantity	N/A	N/A	N/A	N/A	N/A
ODU Mfg. and Model #	N/A	N/A	N/A	N/A	N/A
ODU Weight	N/A	N/A	N/A	N/A	N/A
ODU Dimensions	N/A	N/A	N/A	N/A	N/A
Channels	N/A	N/A	N/A	N/A	N/A
Mount Mfg and Model (Attach Specs)	TBD	TBD	TBD	N/A	N/A
Tower Mount Mounting Height (On Tower)	120	120	120	N/A	N/A
Transmit Frequency (MHz)	see spec sheet	see spec sheet	see spec sheet	N/A	N/A
Receive Frequency (MHz)	see spec sheet	see spec sheet	see spec sheet	N/A	N/A
Number of Coax Cables (PER SECTOR)	4	4	4	N/A	N/A
Diameter of Coax Cables (in)				N/A	N/A
Type of Service (i.e. CDMA, GSM, TDMA)	UMTS/LTE	UMTS/LTE	UMTS/LTE		

Skyway Towers Collocation Application

Please Note: "AUX" can be used for Microwave, TTA, LNA, or GPS antenna information.

GROUND SPACE REQUIREMENTS

Equipment Enclosure ☑ BTS Cabinets Number of BTS Cabinets: 1

☐ Outdoor Shelter

☐ Other

Total Ground Space Dimensions (HxWxD)(ft):	10' x 12'
Cabinet/BTS/Shelter Dimensions (HxWxD)(ft):	see spec sheet
Concrete Pad Dimensions (HxWxD)(ft):	10' x 12'
Cabinet/Shelter Manufacturer/Model:	Ericsson RBS 6201 Cabinet

POWER REQUIREMENTS

AC Power:	Required Voltage and Total Amperage:	TBD
Electrical Service Provider:	Electrical Service Telephone Number:	
Is a multi-tenant meter rack present:	☑ YES ☐ NO	
How many, if any, empty meter banks are present:		

GENERATOR INFORMATION

Generator Ground Space Requirement (HxWxD)(ft):	N/A	Fuel Type (Natural Gas, Diesel):	N/A
Generator Owner (Applicant/Tenant):	N/A	Fuel Tank Location:	☐ Attached ☐ Separate ☑ None
Capacity (KW):	N/A	Fuel Tank Size (Gallons):	N/A
Generator Make:	N/A	Generator Model:	N/A

Description of Proposed Installation & Final Configuration

Final Configuration:
(3) AIR21 B4A B2P antennas
(3) RRU's 11 B2
(3) COVP's
(6) coax

SITE FEASIBILITY WALK

To confirm your onsite needs and requirements, Skyway Towers will schedule a predesign site walk with a Field Support Services Representative. Please indicate whether you desire to schedule an onsite meeting: ☐ YES ☐ NO

SITE DATA PACKAGE FORMAT

Please confirm how you wish to receive your site data package for this application: ☐ Email ☐ Compact Disk

FEES & PAYMENT INFORMATION

Standard Application Fee: $1,500. Payable to Skyway Towers, LLC
Standard Site Inspection Fee: $2,500. Payable to Skyway Towers, LLC
Standard Structural Analysis Fee: $1,500. Payable to Skyway Towers, LLC
Please reference Skyway Site ID and description of fee when submitting payment.

Mail payments to:
Skyway Towers, LLC
Attn: Accounts Payable
20525 Amberfield Drive, Suite 102
Land O Lakes, FL 34638

- This Application is subject to Skyway Towers Site Engineering and Real Estate approval.
- Ground lessor consent may be required as a condition to the execution of your lease.
- Modifications to the tower site may be subject to local zoning approval.
- If available, attach manufacturer's equipment specifications for antennas, mounts, cabinets, shelters, etc.
- When requesting ground space, do not include a buffer around your desired physical footprint. Skyway Towers, at its sole discretion, will provide a non-exclusive buffer between your installation and other proposed and/or existing tenants to allow for access and maintenance
- Tenant covenants that Tenant's Equipment and the construction, installation, operation, maintenance, repair, removal or replacement thereof shall not damage the Tower or improvements or interfere with the use of the Tower by Landlord or other existing users on the Tower. Should Tenant cause any damage or interference to the Tower or equipment of other existing users, Tenant shall be solely responsible for all costs associated with any required repairs, removal or replacements.
- Tenant agrees to pay any invoices to that effect within 30 days of receipt.
- Tenant work shall be completed in accordance with the Skyway approved application and structural. Any deviation or changes will result in additional fees and monthly rent.

From our home page you gain instant access to our database of Towers.

http://www.skywaytowers.com/

Skyway Towers Confidential

T-Mobile
12920 SE 38th Street
Bellevue, WA 98006

DATE: March 27, 2015
SUBJECT: FCC Compliance Assessment for Proposed **T-Mobile Site 5RA0532D**

T-Mobile South, LLC has been requested to evaluate the radio frequency emissions of our proposed site 5RA0532D. In addition, T-Mobile South, LLC has been requested to address other RF related topics such as transmitter operation and maximum permissible output power levels. The remainder of this report will address all RF related items requested by Durham County Zoning/Planning for proposed site 5RA0532D.

Transmitter Operation

T-Mobile owns the AWS E & F LTE Bands and A3 & A4 PCS Band licenses in Durham County. The transmitters being used on the proposed site are authorized to operate in the 2140-2155 and 1930-1940 Megahertz (MHz) frequency range. The Ericsson Node B base station transmitters T-Mobile utilizes have a maximum output level of 80 watts. T-Mobile utilizes the GSM, LTE and UMTS digital technology. As a result our transmitters utilize Gaussian Minimum Shift Keying (GMSK), 16-State Quadrature Amplitude (16QAM), 64-State Quadrature Amplitude (64 QAM) and Quadrature Phase Shift Keying (QPSK) modulation. Precision filters limit unwanted and spurious emissions to levels below the FCC specification. The signals being transmitted will not interfere with the operation of commercial radio, cellular radio, television, telephone or other FCC approved communication equipment. For our proposed site 5RA0532D, GSM technology will not be deployed.

Maximum Permissible Output Power

The maximum permissible output power for 1900 band per sector is 1640 Watts of effective radiated power (ERP) from the antennas in Durham County. The proposed site 5RA0532D is only transmitting 196 total watts ERP.

The maximum permissible output power for 2100 band per sector is 1640 Watts of effective radiated power (ERP) from the antennas in Durham County. The proposed site 5RA0532D is only transmitting 196 total watts ERP.

RF Exposure (NIER levels)

The FCC states in 47 CFR 1.1310 that the maximum permissible exposure (MPE) level from nonionizing electromagnetic radiation (NIER) to the general population at cellular and PCS frequencies is 1.0 milliwatt per centimeter squared (mW/cm^2). MPE is a measure of the RF power density at or below which there are no potential harmful effects from the exposure.

Power density calculations are based on guidelines given by the ANSI Standard C95.1-1992 and are based on a worst case scenario. For analysis purposes, worst case conditions were chosen for all output power levels based on the deployment of LTE and UMTS technologies. The site is being deployed

initially with 3 transmitters. For analysis purposes, 3 transmitters were used. A summary of the results of the power density calculations for site 5RA0532D is listed below in Table 1 and Table 2.

Distance From Tower (Feet)	Power Density (mw/cm2)	%FCC Standard
1	0.000008951	0.0008951
25	0.000030815	0.0030815
50	0.000040011	0.0040011
75	0.000109120	0.0109120
100	0.000010380	0.0010380

Table 1: Power Density Summary for Site 5RA0532D for 1900 Band

Distance From Tower (Feet)	Power Density (mw/cm2)	%FCC Standard
1	0.000008951	0.0008951
25	0.000030815	0.0030815
50	0.000040011	0.0040011
75	0.000109120	0.0109120
100	0.000010380	0.0010380

Table 2: Power Density Summary for Site 5RA0532D for 2100 Band

As shown in Table 1, the maximum power density will not exceed 0.000109120 mw/cm2 at ground level in 1900 Band and as shown in Table 2, the maximum power density will not exceed 0.000109120 mw/cm2 at ground level in 2100 Band. Moreover, the average energy expected near ground level is less than 1% of the MPE level. This level does not exceed the MPE limit set by the Federal Communications Commission or the American National Standards Institute.

Based upon the ANSI/FCC standard and the predicted levels of electromagnetic energy emitted by site 5RA0532D, this installation will be of no safety concern to the general public.

Sincerely,

Chris Gunter

Manager, Engineering - RF Deployment
T··Mobile·
2105 Water Ridge Parkway, Suite 400 Charlotte, NC 28217

Client#: 1595479 141SKYWATOW

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 4/20/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
BB&T-Atlantic Risk Management
5850 Waterloo Road, Suite 240
Columbia, MD 21045
410 480-4400

CONTACT NAME: Jennifer Burton
PHONE (A/C, No, Ext): 410-480-4438 FAX (A/C, No): 866-549-3345
E-MAIL ADDRESS: Jennifer.Burton@BBandT.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Hanover Insurance Company	22292
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
Skyway Towers LLC
20525 Amberfield Drive
Suite 102
Land O'Lakes, FL 34638

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT X LOC			RHQ789922505	04/01/2015	04/01/2016	EACH OCCURRENCE	$1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$500,000
							MED EXP (Any one person)	$10,000
							PERSONAL & ADV INJURY	$1,000,000
							GENERAL AGGREGATE	$2,000,000
							PRODUCTS - COMP/OP AGG	$2,000,000
								$
A	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS X HIRED AUTOS SCHEDULED AUTOS X NON-OWNED AUTOS			RHQ789922505	04/01/2015	04/01/2016	COMBINED SINGLE LIMIT (Ea accident)	$1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			UHQ789922405	04/01/2015	04/01/2016	EACH OCCURRENCE	$10,000,000
							AGGREGATE	$10,000,000
								$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WHQ907417704	04/01/2015	04/01/2016	X WC STATU-TORY LIMITS OTH-ER	
							E.L. EACH ACCIDENT	$1,000,000
							E.L. DISEASE - EA EMPLOYEE	$1,000,000
							E.L. DISEASE - POLICY LIMIT	$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
If required by written contract, the Certficate Holder is Additional Insured in regard to General Liability with respect to the operations of the named insured for the Erwin Road NC-08828 tower, subject to policy provisions. A 30 day notice of cancellation will be provided to the certificate holder.

CERTIFICATE HOLDER

Orange County Planning Department
Attn: Michael Harvey
131 West Margaret Lane
P.O. Box 8181
Hillsborough, NC 27278

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

David F. Saul

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