

Rowan County
Telecommunications Site Review
New Support Structure

CityScape
CONSULTANTS, INC.
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December 13, 2021

Mr. Shane Stewart
Senior Planner
15 East Fourth Street
Wendell, NC 27591
130 West Innes Street
Salisbury, NC 28144

RE: APPLICANT/PROVIDER: Verizon Wireless
VERIZON SITE ID: Mount Hope
ADDRESS: 280 Rimer Road, Salisbury, NC
LATITUDE: 35° 33' 55.5" N **LONGITUDE:** -80° 29' 05.8" W

Dear Mr. Stewart,

At your request, on behalf of Rowan County, North Carolina ("County"), CityScape Consultants, Inc. ("CityScape") in its capacity as telecommunications consultant for the County, has reviewed the revised application for the above-mentioned application submitted by Verizon Wireless ("Applicant") to construct a new one hundred sixty-five (165) foot monopole tower and associated ground compound at 280 Rimer Road, Salisbury, North Carolina, *see Figure 1*. The property is zoned RA and the proposed structure will not require FAA lighting.

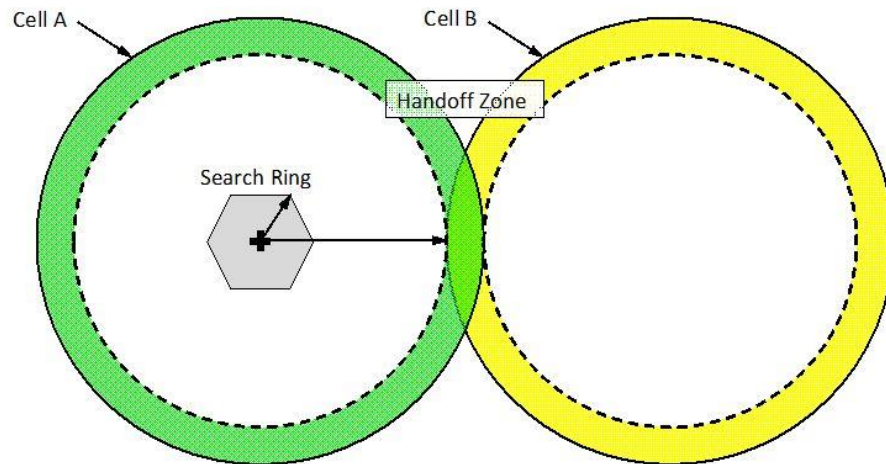
Wireless Informational Tutorial

Cellular, PCS and EMSR wireless communications systems depend on the concept of resource reuse to achieve their network goals and objectives. With some technologies, the individual channel frequencies are reused every few cells, but not too closely, since interference would result. Wireless service is achieved through ground equipment and antennas mounted on towers, buildings or other elevated structures. The height and location of the elevated antenna platform is critical to provide sufficient wireless network coverage. Generally, the higher the antenna is mounted on the support structure, the farther the wireless signal penetrates a geographic area.

In the wireless system evolution, a provider would initially provide service with facilities spaced further apart with relatively tall antenna elevations to maximize the "footprint" at minimal cost. As the subscriber density increases, network capacity for these facilities increases, resulting in frequent busy signals or "no service" messages for end users. To remedy this situation, the antennas are mounted at lower heights to reduce the coverage area, thus reducing subscriber count per facility. When coverage areas are reduced, a new facility is needed to fill in the previously served area.

The Search Ring is a vital part of the submittal for any new personal wireless facility. The Ring identifies the optimum location for the facility and will control the operating parameters needed to meet the facility objectives. Of primary interest to a community are the location and the height of a structure all which is dictated by the Ring. Cellular search areas are usually circles of approximately one-quarter the radius of the proposed cell. In practice, it is simple to determine whether the search

area radius is reasonable. The distance from the closest existing site is determined, halved, and a handoff "overlap" of about 20 percent is added. One fourth of this distance is the search area radius. *Sample 1* illustrates this graphically.



Sample 1 - The hexagonal search ring radius is $\frac{1}{4}$ of the radius of the cell's coverage less a 20% handoff overlap

A reasonable search ring location is a key element in assuring that a site is justified. Generally, new wireless communication facilities are equally spaced with respect to existing sites. However, terrain, network capacity and other issues may necessitate a facility that it is *not* equally spaced with respect to existing sites. Typically, the wireless provider is asked to provide coverage prediction maps to indicate that a site is properly located.

An important part of any wireless communication facility application is the verification of the provider's proposed height requirements with generally accepted engineering. Verizon 700 and 800 MHz for voice communications and Advanced Wireless Service (AWS 1700/2100 MHz) for data within Rowan County.

In addition to the minimum height and power needed for effective signal coverage, as more wireless devices are deployed, user capacity issues become the limiting factor. Technology is improving which allows towers to handle more devices, but it is not keeping up with the speed that such devices are connecting. As the industry heads for 5G in the next 2-3 years, more *localized* cellular sites will be needed. This will involve shorter towers that are closer together to limit their "reach". This practice has already begun in urbanized areas for the past few years and will continue in rural and urban residential areas. The future will also involve what are known as "small cells" which are antennas placed on street lamps, shorter buildings, etc. For these reasons, as well as the fact that the proposed site is surrounded by neighborhoods, the County can limit the height of the proposed structure and require it to be concealed *or stealth*. This is not a recommended candidate for a stealth facility.

This application is proposed to improve coverage and capacity to the area southwest of Faith, mainly west of Faith Road, north of Highway 152 East and east of Old Concord Road.

The proposal has been evaluated from the following perspectives:

- Whether the proposed facility, as specified, is justified due to technological reasons and is essential for the Applicant to provide its telecommunications service; and,
- Whether the proposed facility will follow the guidelines of the Telecommunications Act of 1996, the Rowan County Ordinance and all other pertinent rules and regulations.

Rowan County Ordinance Requirements

(Sections below may be abbreviated for this review. See actual Ordinance for full text)

Article III

§ 21-52 Site Plan Required

- (1) Zone lot with dimensions - provided
- (2) Tax parcel number - provided
- (3) Property address - provided
- (4) Adjoining deeded properties and uses - provided
- (5) Existing structures - provided
- (6) Proposed structure with size - provided
- (7) Proposed use - provided
- (8) Number of employees – N/A
- (9) Hours of operation – N/A
- (10) Off-street parking - provided
- (11) Easements & ROW - provided
- (12) All pertinent development requirements - provided
- (13) Any additional required information – N/A
- (14) Floodplains - None
- (15) Name, location, dimension of proposed streets – provided
- (16) Screening & Buffering – Not required
- (17) Zoning District - RA
- (18) Proposed phasing – N/A
- (19) Site plan details - provided

§ 21-58 Review Procedures

- (a) Submission – provided
 - (b) Conditional use review – N/A, this is specific to the County
 - (c) Site plan required - Provided
 - (d) Oath - Applicant Agrees
 - (e) Required findings
 - (1) Public Health/safety – Complies
 - (2) Will not injury value of adjacent property – Explanation provided; County will need to make decision of acceptance of explanations.
 - (3) General harmony – Explanation provided; County will need to make decision of acceptance of explanations.
-

(f) Amendments – N/A

§ 21-59 Evaluation Criteria

- (1) Adequate transportation access to site – Provided
- (2) Character of surrounding area - Explanation provided; County will need to make decision of acceptance of explanations.
- (3) Hazardous safety conditions – Provided
- (4) Noise, odor, glare, or dust – Addressed
- (5) Excessive traffic or parking problems – Addressed
- (6) Visual Impacts -

§ 21-60 Conditional Use Requirements for Specific Uses

(3) Communications and Wireless Support Structures

a. New wireless support structures

1. Responses of letters sent to tower owners within search ring requesting – N/A
 - No existing tall structures exists inside the search ring of the proposed site
 - i. Height
 - ii. Existing tenants
 - iii. Collocation possibility
 - iv. Can site be upgraded to permit collocation
2. Inventory of all preferred sites within search ring (including analysis) – N/A
 - No existing tall structures exists inside the search ring of the proposed site
3. Completed application
 - i. Site Plan – provided
 - ii. Topography information – provided
 - iii. Tower Height and antenna location – provided
 - iv. See below
 - Setbacks including ingress and egress easements - provided
 - Fall zone – provided on site plan and in letter dated November 19, 2021 Sabre Industries.
 - Fencing and screening provided
 - Applicant offers to retain to the maximum extent possible existing dense vegetation.
 - v. Adjacent land uses – provided
4. Site Photos - provided
5. Photo simulations - provided
6. Engineering collocation report - provided

b. Tower heights and types

1. Rural Agricultural, less than 199 feet – complies
 - Applicant proposed 165-foot monopole
2. N/A
3. i. N/A
- ii. N/A

c. Provisions for tower safety – 50-foot engineered fall radius

d. Retention of consultant – CityScape review

e. Obstruction lighting and marking – N/A

f. FCC license required – licensed provided

Site Justification and Coverage

For a new wireless communications facility to be justified, its need, location and height must be addressed. The application proposes to construct a new, one hundred sixty-nine (169) foot *monopole* tower, *see Appendix, Exhibit A*. The parcel is zoned “RA”, which permits a maximum tower height of 199 feet.

The site is located within the search ring and there are no other towers or sufficient height buildings within the search ring for collocation. There are two potential collocation opportunities in a 225-foot tower located 1.4 miles to the south-southwest (ASRN #1201282) and a 307-foot tower 1.9 mile south-southeast of the proposed site (ASRN #10066282). *Figure 2* is a map depicting the proposed site, the two nearby sites mentioned above and an approximate overlay of the provided Verizon search ring. However, it is not believed either of these could meet Verizon’s needs.

Verizon stated the purpose of this site is to improve coverage and capacity in the areas southwest of Faith and north of Highway 152. More specifically, this site is needed to alleviate capacity issues from the current Verizon site that serves this area, located northeast of Faith near the Granite Quarry. It is also noted that the three Verizon sites that will “handoff” to this site are evenly spaced at 3.7 miles (east), 3.7 miles (northeast) and 3.8 miles northwest of the proposed site. The proposed site is located near the southern edge of the search ring. Locating further south, such as either of these collocations would reduce its ability to relieve capacity in and around Faith. This is because capacity relief is not about more height and further coverage but being near of the areas needing relief.

Capacity is also the reason the Applicant is only proposing a height of 165 feet (169 feet to top of lightning rod). Additional height would cause the signal to propagate further, reducing its capacity relief effectiveness and potentially interfering with surrounding facilities.

The Ordinance requires the towers under 200 feet support up to 5 collocations. Typically, this is a valid number, but it is somewhat aggressive here given the proposed height and proximity to other nearby towers. However, these spaces will only be used if needed and CityScape finds no reason to reduce the requirement.

Buffering

The proposed tower is more than 200 feet from the nearest existing structure. Section 21-219 states buffering does not apply in for this reason. The site is also surrounded by a thick tree canopy and more than 125 feet from any property line.

FCC Compliance

The Applicant provided the necessary FCC compliance statements regarding interference to other radio services and safeguards to human exposure of radio frequency energy in a letter dated, November 1, 2017, *see Appendix, Exhibit C*.

Conclusion

It is the opinion of the undersigned that the application complies with the Rowan County Ordinance. CityScape Consultants, as the wireless expert for the County, supports the application and recommends approval with the following conditions:

1. All feed cables shall be hidden within the monopole and all access ports shall be sealed to prevent wildlife intrusion; and,
2. Prior to permitting, Applicant shall provide a structural analysis by a registered NC engineer or a letter from the tower manufacturer that the tower will comply with ANSI/TIA-222 G or H standards, will accommodate the required number of arrays and certify the 50-foot fall radius; and,
3. If an emergency power backup generator is to be used, its noise level shall not exceed 65dBa at the nearest property edge. Testing shall be limited to the hours between 9:00 A.M. and 4:00 P.M., (Monday through Friday); and,
4. No advertising shall be installed on the fencing near the ground compound

I certify that to the best of my knowledge all the information included herein is accurate at the time of this report. CityScape only works for public entities and has unbiased opinions. All recommendations are based on technical merits without prejudice per prevailing laws and codes.

Respectfully submitted,



Susan Rabold, Project Manager
CityScape Consultants, Inc.

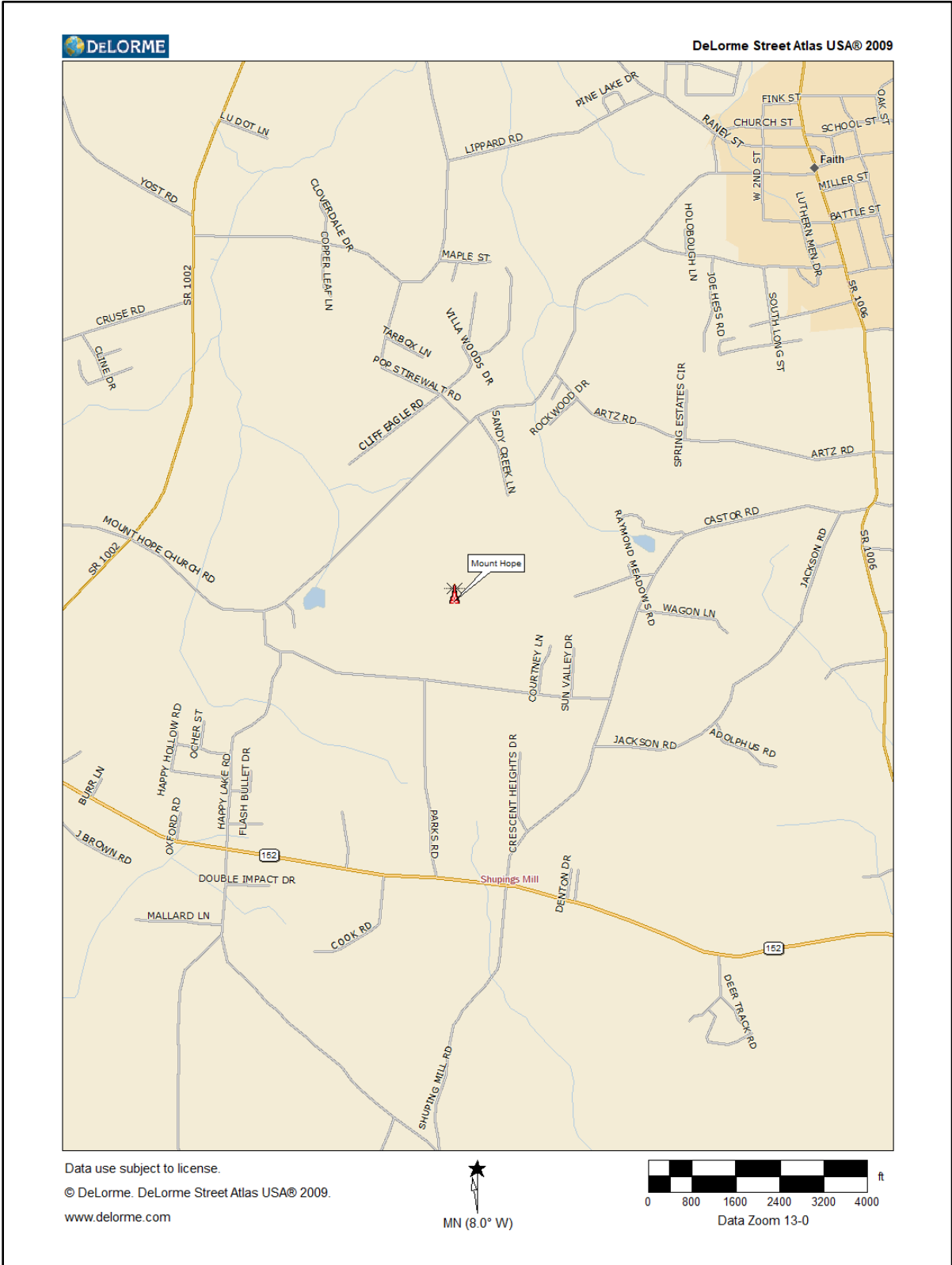


Figure 1 – Site Location

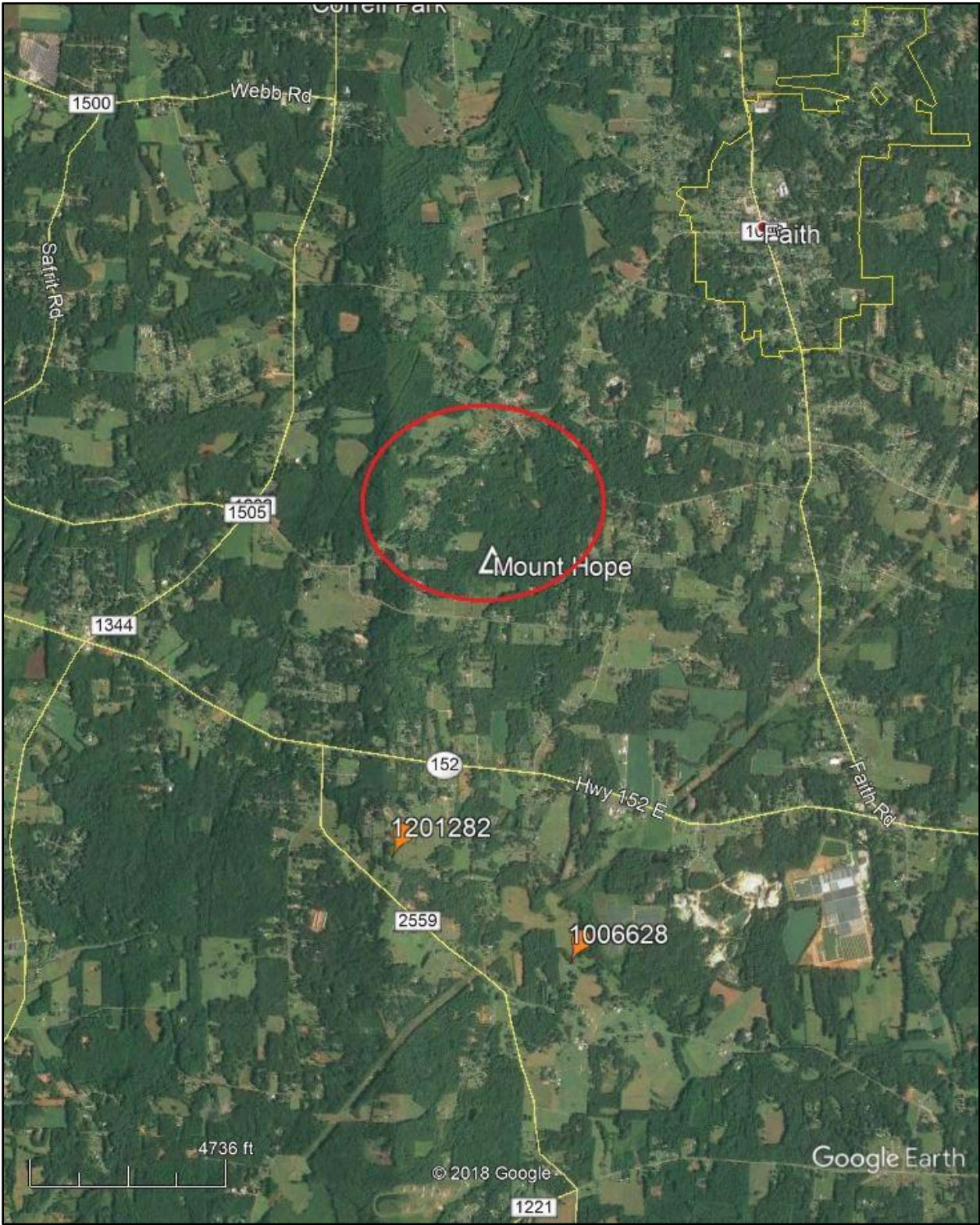


Figure 2 – Aerial View of Proposed and Surrounding Sites

Appendix



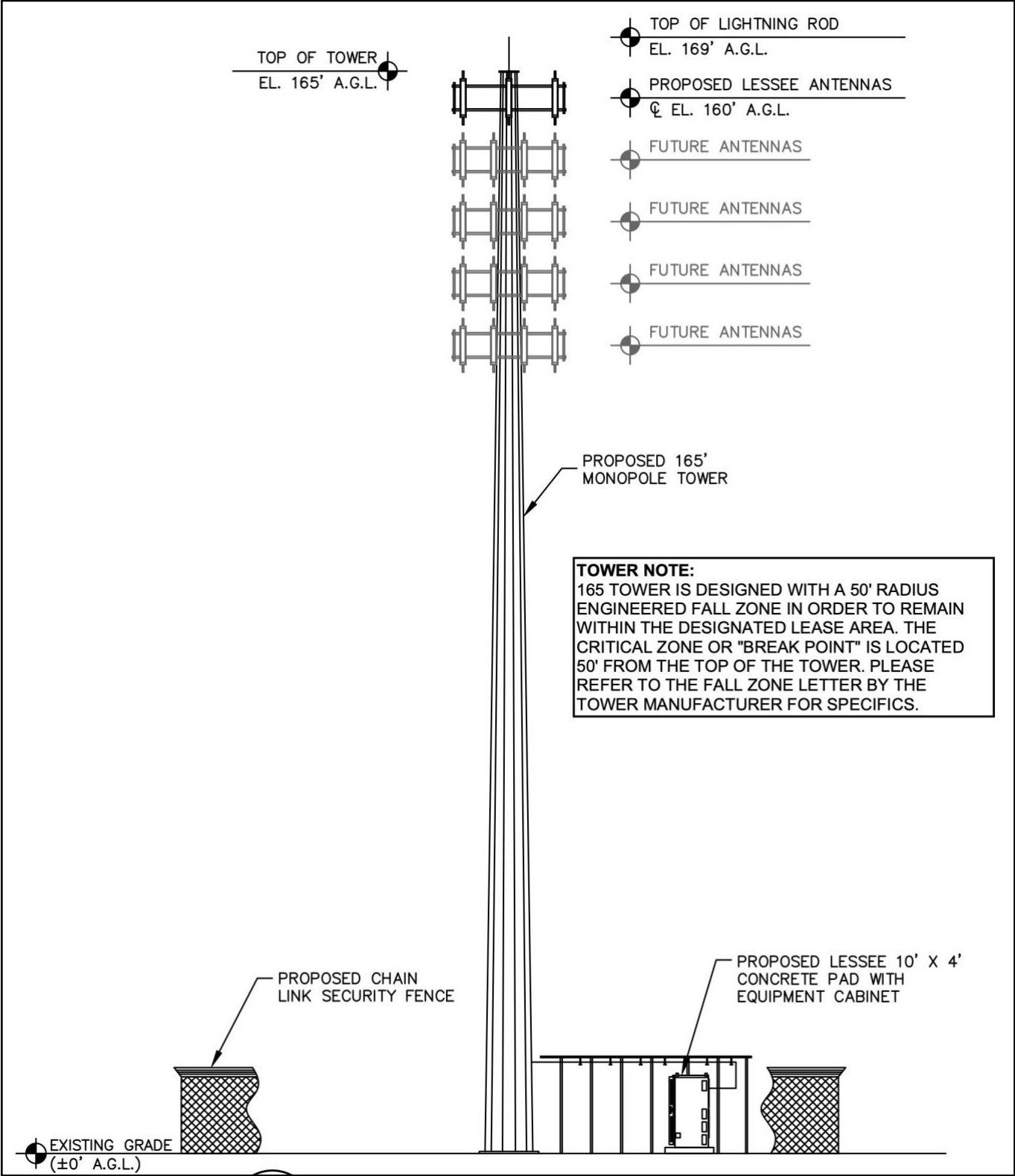


Exhibit A - Proposed Support Structure

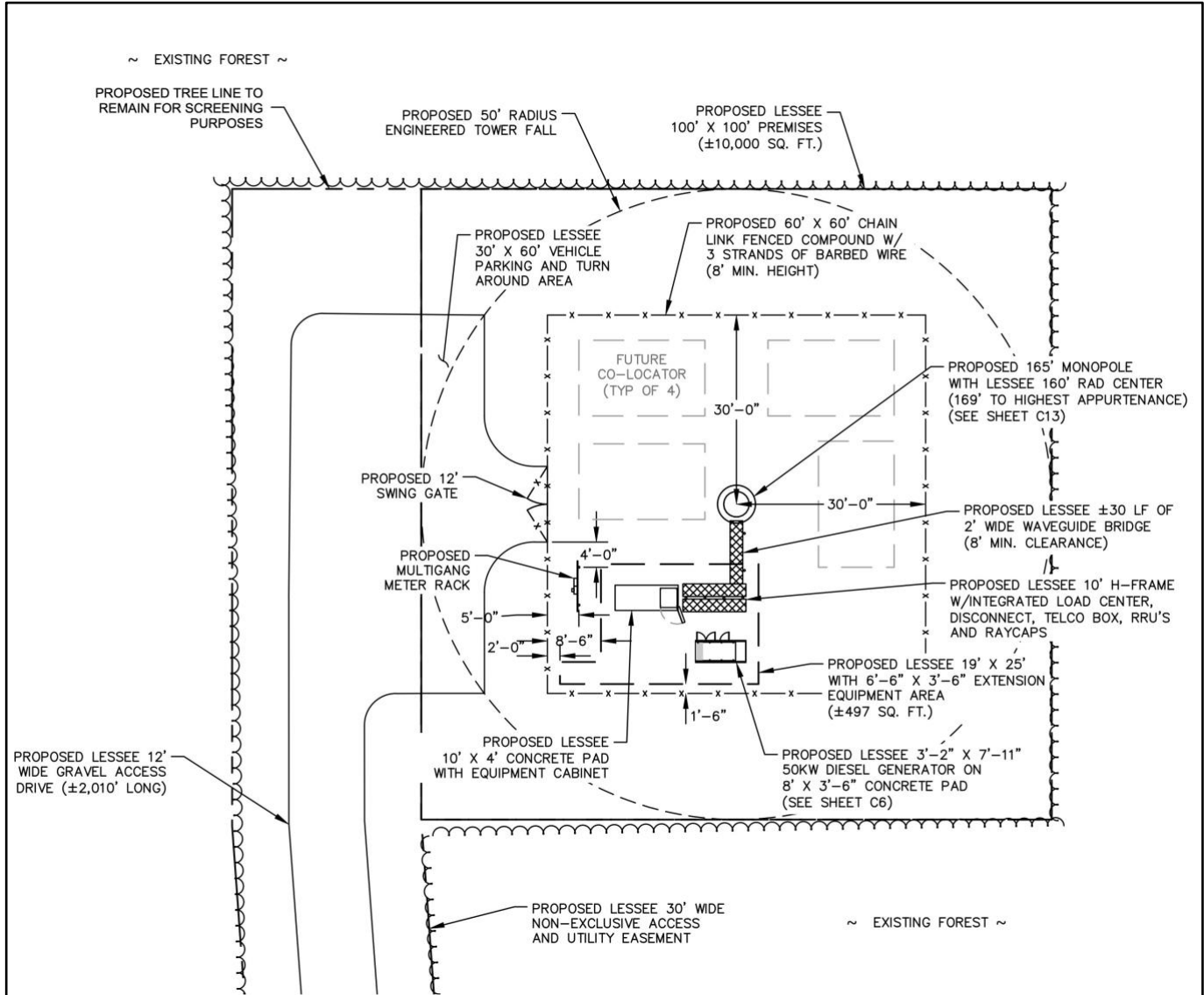


Exhibit B – Proposed Ground Compound



November 1, 2017

Rowan County Planning & Development
ATTN: Ed Muire, Planning & Development Director
402 N. Main Street
Salisbury, NC 28144

RE: Verizon Wireless Non-Interference Statement for Mount Hope

Dear Mr. Muire:

Verizon Wireless operates a Wireless Network authorized by the Federal Communications Commission (FCC) to provide wireless communication throughout the nation, including Rowan County, North Carolina. Verizon Wireless' operation and network are licensed and regulated by the FCC. The FCC rules governing the operation of wireless telecommunications facilities are designed to protect co-channel and adjacent licenses against harmful interference. The FCC has exclusive jurisdiction over these requirements.

The proposed "Mount Hope" Verizon Wireless facility is in compliance with all applicable FCC requirements. Verizon Wireless' engages in the following practices pertinent to complying with FCC requirements:

1. Verizon Wireless locates its transmitting antenna(s) in order to maximize vertical and horizontal separation from other operator's systems to minimize interference potential;
2. All operating hardware at the site is type-accepted by the FCC as far as emission levels within Verizon Wireless' licensed frequency band in addition to spurious emissions outside of Verizon Wireless frequency band;
3. The power levels generated by the base station hardware and corresponding effective radiated power (ERP) from the transmit antenna(s) are within the limitations specified by Part 22 of the Commission's Rules; and
4. Intermodulation studies are prepared and analyzed considering all carriers on the tower to ensure no mixing of frequencies will create harmful interference to/from Verizon Wireless' wireless system.

Verizon Wireless is committed to providing state of the art wireless services that benefits your community. If you have any questions please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Ashutosh Pandey".

Ashutosh Pandey

RF Engineer – Verizon Wireless

Exhibit C – FCC Compliance