COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the matter of:

THE APPLICATION OF EAST KENTUCKY NETWORK LLC FOR THE ISSUANCE OF A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONSTRUCT A TOWER IN WOLFE COUNTY, KENTUCKY.	)	CASE NO. 2021-00008

East Kentucky Network, LLC d/b/a Appalachian Wireless was granted authorization to provide cellular service in the KY-10 Cellular Market Area (CMA452) by the Federal Communications Commission (FCC). The FCC license is included as Exhibit 1. East Kentucky Network, LLC merger documents were filed with the Commission on February 2, 2001 in Case No. 2001-022. East Kentucky Network, LLC is a Kentucky limited liability company that was organized on June 16, 1998. East Kentucky Network, LLC is in good standing with the Commonwealth of Kentucky.

In an effort to improve service in Wolfe County, pursuant to KRS 278.020 Subsection 1 and 807 KAR 5:001, East Kentucky Network, LLC is seeking the Commission's approval to construct a 190 foot monopole tower on a tract of land located at 1711 KY 746, Campton, Wolfe County, Kentucky (37°45'50.32"N 83°31'34.68"W). A map and detailed directions to the site can be found in Exhibit 7.

Construction of the proposed tower is required by public convenience and necessity. Due to increasing demand for telecommunications service, the proposed tower is necessary to provide adequate coverage. The proposed tower will improve service in Wolfe County by providing an interconnection between East Kentucky Network, LLC other sites thereby forming a cohesive network.

Exhibit 2 is a list of all Property owners according to the Property Valuation Administrator's record who own property within 500 feet of the proposed Tower and all property owners that own

property contiguous to the property upon which construction is proposed in accordance with the Property Valuation Administrator's record.

Pursuant to 807 KAR 5:063 Section 1(1)(l), Section 1(m) and Section 2, all affected property owners according to the Property Valuation Administrator's records who own property within 500 feet of the proposed Tower or contiguous to the property upon which construction is proposed were notified by certified mail return receipt requested of East Kentucky Network, LLC's proposed construction and informed of their right to intervene. They were given the docket number under which this application is filed. Enclosed in Exhibit 2 is a copy of that notification.

Wolfe County has no formal local planning unit. In absence of this unit, the Wolfe County Judge Executive's office was notified by certified mail, return receipt requested, of East Kentucky Network, LLC's proposal and informed of their right to intervene. The Wolfe County Judge Executive's office was also given the docket number under which this application is filed. Enclosed in Exhibit 3 is a copy of that notification.

Notice of the location of the proposed construction was published in The Wolfe County News, January 28, 2021, edition. Enclosed is a copy of that notice in Exhibit 3. The Wolfe County News is the newspaper with the largest circulation in Wolfe County.

A geologist was employed to determine soil and rock types and to ascertain the distance to solid bedrock. The geotechnical report is enclosed as Exhibit 4.

A copy of the tower design information is enclosed as Exhibit 5. The proposed tower has been designed by engineers at Tapp, Inc. and will be constructed under their supervision. Their qualifications are evidenced in Exhibit 5 by the seal and signature of the registered professional engineer responsible for this project.

The tower will be erected by S & S Tower Services of St. Albans, West Virginia. S & S Tower Services has vast experience in the erection of communications towers. Their qualifications are described in Exhibit 13.

FAA and Kentucky Airport Zoning Commission Approvals are included as Exhibit 6.

No Federal Communications Commission approval is required prior to construction of this facility. Once service is established from this tower we must immediately notify the Federal Communications Commission of its operation. Prior approval is needed only if the proposed facility increases the size of the cellular geographic service area. This cell site will not expand the cellular geographic service area.

Two notice signs meeting the requirements prescribed by 807 KAR 5:063, Section 1(2), measuring at least two (2) feet in height and four (4) feet in width and containing all required language in letters of required height, have been posted, one at a visible location on the proposed site and one on the nearest public road. The two signs were posted on January 15, 2021, and will remain posted for at least two weeks after filing of this application as specified.

Enclosed in Exhibit 8 is a copy of East Kentucky Network, LLC's Memorandum of Lease for the site location along with a lot description.

The proposed construction site is located on a tract of land previously developed.

East Kentucky Network, LLC's operation will not affect the use of nearby land nor its value. No more suitable site exists in the area. A copy of the search area map is enclosed in Exhibit 7. One other tower, which is owned by Mountain Telephone Coop Corp., exists within the search area, and East Kentucky Network, LLC currently colocates on this tower. However, the tower is reaching capacity and cannot accommodate East Kentucky Network, LLC's needs. To better serve the community, East Kentucky Network, LLC requires its own tower so that it may add more equipment as needed and move the equipment to higher elevations.

Enclosed, and filed as Exhibit 9 is a survey of the proposed tower site signed by a Kentucky registered professional engineer.

Exhibit 10 is a map in one (1) inch equals 200 feet scale identifying every structure and every owner of real estate within 500 feet of the proposed tower and all property owners who own contiguous property to the property upon which construction is proposed.

Exhibit 11 contains a vertical sketch of the tower supplied by James W. Caudill, Kentucky registered professional engineer.

Enclosed as Exhibit 12 is a list of utilities, corporations, or persons with whom the tower is likely to compete.

[THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

WHEREFORE, Applicant, having met the requirements of KRS 278.020(1), 278.650, 278.665, and all applicable rules and regulations of the PSC, respectfully requests that the PSC accept the foregoing Application for filing and grant a Certificate of Public Convenience and Necessity to construct and operate the proposed tower.

The foregoing document was prepared by Krystal Branham, Regulatory Compliance Attorney for East Kentucky Network, LLC d/b/a Appalachian Wireless. All related questions or correspondence concerning this filing should be mailed to East Kentucky Network, LLC d/b/a/ Appalachian Wireless, 101 Technology Trail, Ivel, KY 41642.

SUBMITTED BY: Lynn Haney DATE: 1/22/21
Lynn Haney, Regulatory Compliance Director

APPROVED BY: W A Gillum DATE: 1/22/21
W.A. Gillum, General Manager

ATTORNEY: Krystal Branham DATE: 1/26/2021
Hon. Krystal Branham, Attorney

CONTACT INFORMATION:

W.A. Gillum, General Manager
Phone: (606) 477-2355, Ext. 111
Email: wagillum@ekn.com

Lynn Haney, Regulatory Compliance Director
Phone: (606) 477-2355, Ext. 1007
Email: lhaney@ekn.com

Krystal Branham, Attorney
Phone: (606) 477-2355, Ext. 1009
Email: kbranham@ekn.com

Mailing Address:

East Kentucky Network, LLC
d/b/a Appalachian Wireless
101 Technology Trail
Ivel, KY 41642

1 FCC License

2 Copies of Cell Site Notice to Land Owners

3 Notifications of County Judge Executive and Newspaper

4 Universal Soil Bearing Analysis

5 Tower Design

6 FAA and KAZC Determination

7 Driving Directions from County Court House and Map to SUitable Scale

8 Memorandum of Lease for Proposed Site with Legal Description

9 Survey of Site Signed/Sealed by Professional Engineer Registered in State of Kentucky

10 Site Survey Map with Property Owners Identified in Accordance with PVA of County

11 Vertical Profile Sketch of Proposed Tower

12 List of Competitors

13 Qualifications

14

15

Exhibit 1

ULS License

Cellular License - KNKN809 - East Kentucky Network, LLC d/b/a Appalachian Wireless

Call Sign	KNKN809	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA452 - Kentucky 10 - Powell	Channel Block	B
Submarket	0	Phase	2

Dates

Grant	08/30/2011	Expiration	10/01/2021
Effective	10/10/2014	Cancellation	

Five Year Buildout Date

10/17/1996

Control Points

1	US Route 23, FLOYD, Harold, KY P: (606)478-2355

Licensee

FRN	0001786607	Type	Limited Liability Company

Licensee

East Kentucky Network, LLC d/b/a Appalachian Wireless
101 Technology Trail
Ivel, KY 41642
P:(606)477-2355

Contact

Lukas, Nace, Gutierrez & Sachs, LLP
Pamela L Gist Esq
8300 Greensboro Drive
McLean, VA 22102
P:(703)584-8665
F:(703)584-8695
E:pgist@fcclaw.com

Ownership and Qualifications

Radio Service Type Mobile

Regulatory Status Common Carrier Interconnected Yes

Alien Ownership
The Applicant answered "No" to each of the Alien Ownership questions.

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

Demographics

Race

Ethnicity

Gender

Exhibit 2

EXHIBIT 2 – LIST OF PROPERTY OWNERS

Statement Pursuant to Section 1 (1) (I) 807 KAR 5:063

Section 1 (1)(I) 1. The following is a list of every property owner who according to property valuation administrator's records, owns property within 500 feet of the proposed tower and each have been: notified by certified mail, return receipt requested, of the proposed construction,

Section 1 (1)(I) 2. Every person listed below who, according to the property valuation administrator's records, owns property within 500 feet of the proposed tower has been: Given the Commission docket number under which the application will be processed: and

Section 1 (1)(I) 3. Every person listed below who, according to property valuation administrator's records owns property within 500 feet of the proposed tower has been: Informed of his right to request intervention.

Section 2. If the construction is proposed for an area outside the incorporated boundaries of a city, the application shall state that public notices required by Section 1(1)(L) have been sent to every person who, according to the property valuation administrator, owns property contiguous to the property upon which the construction is proposed

LIST OF PROPERTY OWNERS

Todd Haddix
212 Lowell Lesher Road
Campton, KY 41301

Todd Haddix and Chastity Haddix
50 Rose Street
Campton , KY 41301

John and Betty Mayabb
1625 KY 746
Campton, KY 41301

B. Scott Graham
P.O. Box 637
Stanton, KY 40380

Pauline Ratliff
P.O. Box 132
212 Lowell Lesher Road
Campton, KY 41301

Mountain Telephone Coop Corp.
P.O. Box 399
West Liberty, KY 41472

Kenneth Ray Branham
P.O. Box 873
Campton, KY 41301

Appalachian WIRELESS
www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

Todd Haddix
212 Lowell Lesher Road
Campton, KY 41301

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

East Kentucky Network, LLC d/b/a Appalachian Wireless has applied to the Public Service Commission of Kentucky for a Certificate of Public Convenience and Necessity to construct and operate a new facility to provide cellular telecommunications service in Wolfe County. The facility will include a 190-foot self-supporting tower with attached antennas extending upwards, and an equipment shelter located on a tract of land at 1711 KY 746, Campton, Wolfe County. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

The Commission invites your comments regarding the proposed construction. You also have the right to intervene in this matter. The Commission must receive your initial communication within 20 days of the date of this letter as shown above.

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00008 in your correspondence.

If you have any questions for East Kentucky Network, LLC, please direct them to my attention at the following address: East Kentucky Network, LLC, 101 Technology Trail, Ivel, KY 41642 or call me at 606-477-2355, Ext. 1007.

Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

Appalachian WIRELESS
www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

Todd Haddix and Chastity Haddix
50 Rose Street
Campton, KY 41301

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Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

Appalachian WIRELESS
www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

John and Betty Mayabb
1625 KY 746
Campton, KY 41301

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

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Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

Appalachian WIRELESS
www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

B. Scott Graham
P.O. Box 637
Stanton, KY 40380

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

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January 22, 2021

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P.O. Box 132
212 Lowell Lesher Road
Campton, KY 41301

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Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

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www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

Mountain Telephone Coop Corp.
P.O. Box 399
West Liberty, KY 41472

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

East Kentucky Network, LLC d/b/a Appalachian Wireless has applied to the Public Service Commission of Kentucky for a Certificate of Public Convenience and Necessity to construct and operate a new facility to provide cellular telecommunications service in Wolfe County. The facility will include a 190-foot self-supporting tower with attached antennas extending upwards, and an equipment shelter located on a tract of land at 1711 KY 746, Campton, Wolfe County. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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Sincerely,

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Enclosure 1

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www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 22, 2021

Kenneth Ray Branham
P.O. Box 873
Campton, KY 41301

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

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Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

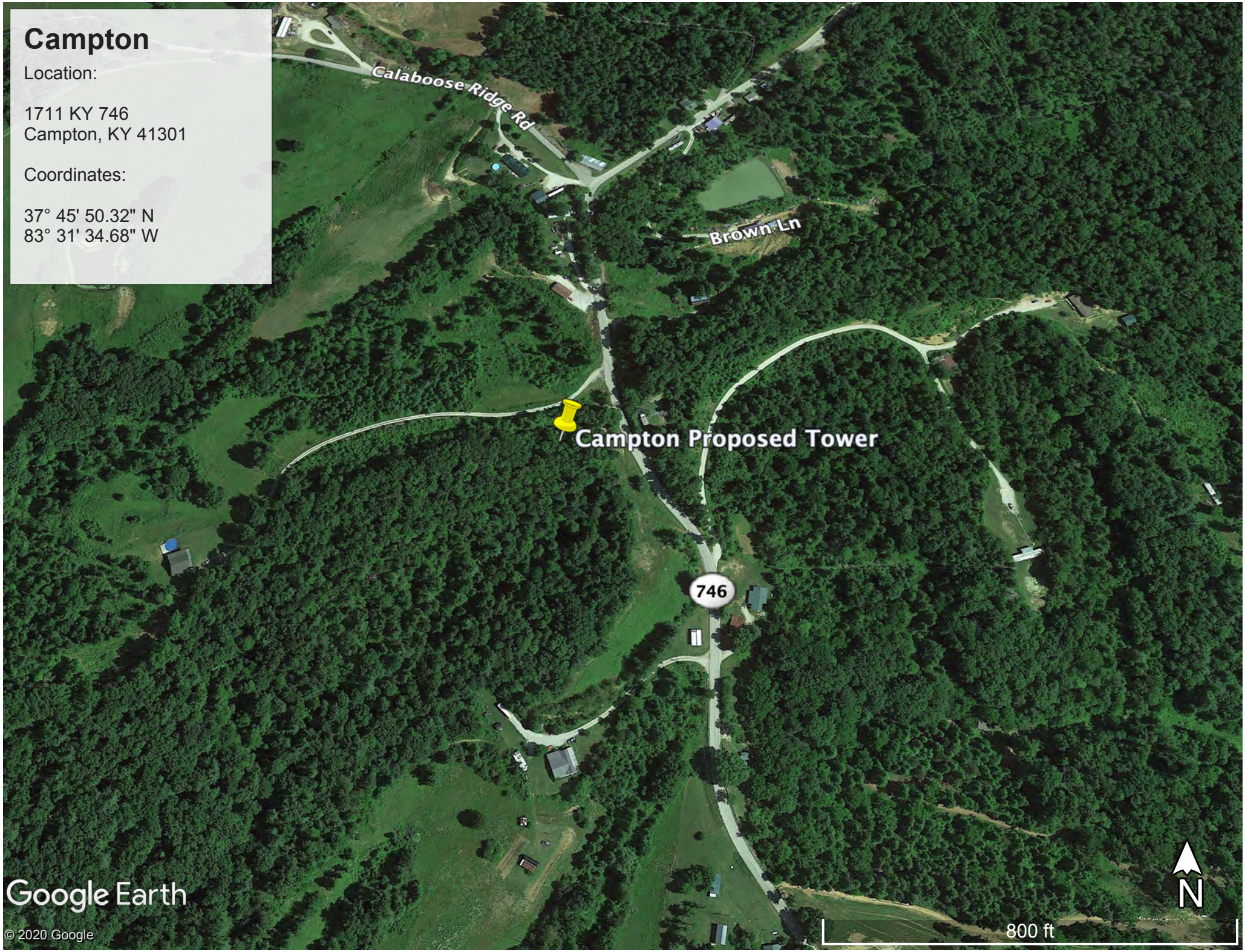
Campton
Location:
1711 KY 746
Campton, KY 41301
Coordinates:
37° 45' 50.32" N
83° 31' 34.68" W
Calaboose Ridge Rd
Brown Ln
Campton Proposed Tower
746
N
800 ft
Google Earth
© 2020 Google

Exhibit 3

Appalachian WIRELESS
www.appalachianwireless.com

EAST KENTUCKY NETWORK, LLC
www.ekn.com

VIA: U.S. CERTIFIED MAIL

January 22, 2021

Raymond Banks, Judge Executive
P.O. Box 429
Campton, KY 41301

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00008)

East Kentucky Network, LLC d/b/a Appalachian Wireless has applied to the Public Service Commission of Kentucky for a Certificate of Public Convenience and Necessity to construct and operate a new facility to provide cellular telecommunications service in Wolfe County. The facility will include a 190-foot self-supporting tower with attached antennas extending upwards, and an equipment shelter located on a tract of land located at 1711 Highway 746, Wolfe County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you are the County Judge Executive of Wolfe County.

The Commission invites your comments regarding the proposed construction. You also have the right to intervene in this matter. The Commission must receive your initial communication within 20 days of the date of this letter as shown above.

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00008 in your correspondence.

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Sincerely,

Lynn Haney

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure

dba Appalachian Wireless
101 Technology Trail
Ivel, KY 41642
Phone: 606-477-2355
Fax: 606-791-2225

EAST KENTUCKY NETWORK

To:	The Wolfe County News Attn: Classifieds	**From:**	Raina Helton Regulatory Compliance Assistant
Email:	wolfenew@mrtc.com	**Date:**	January 19, 2021
Re:	PUBLIC NOTICE ADVERTISEMENT	**Pages:**	1

Please place the following Public Notice Advertisement in The Wolfe County News to be ran on January 28, 2021.

PUBLIC NOTICE:

RE: Public Service Commission of Kentucky (CASE NO. 2021-00008)

Public Notice is hereby given that East Kentucky Network, LLC, dba Appalachian Wireless has applied to the Kentucky Public Service Commission to construct a cellular telecommunications tower on a tract of land located at 1711 Highway 746, Campton, Wolfe County, Kentucky. The proposed tower will be a 190 foot self-supporting tower with attached antennas. If you would like to respond to this notice, please contact the Executive Director, Public Service Commission, 211 Sower Boulevard, PO Box 615, Frankfort, Kentucky 40602. Please refer to Case No. 2021-00008.

If you have any questions about the placement of the above-mentioned notice, please call me at 606-477-2375, ext. 1005.

Thank you,

Raina Helton
Regulatory Compliance Paralegal

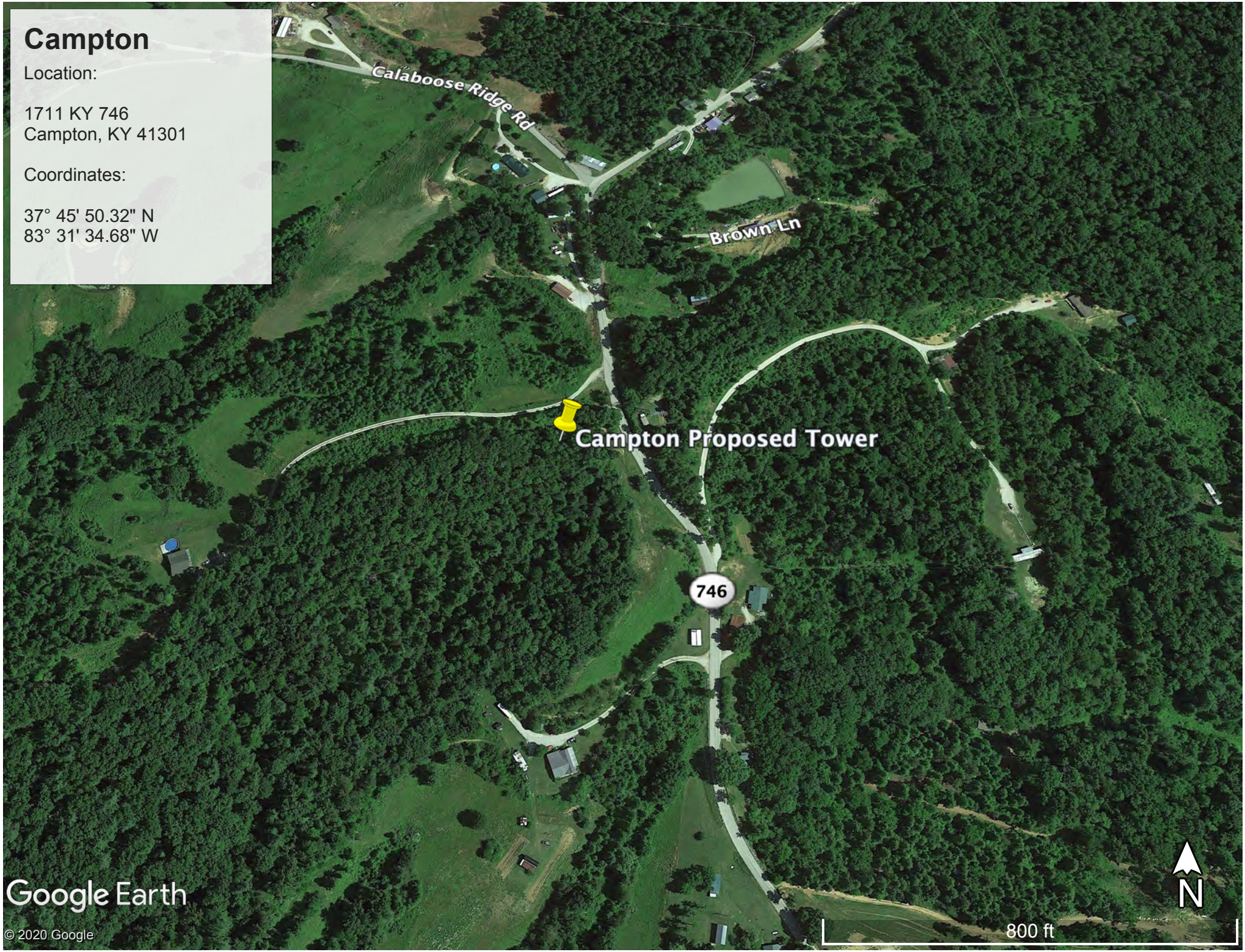

Campton
Location:
1711 KY 746
Campton, KY 41301
Coordinates:
37° 45' 50.32" N
83° 31' 34.68" W
Calaboose Ridge Rd
Brown Ln
Campton Proposed Tower
746
N
800 ft
Google Earth
© 2020 Google

Exhibit 4

230 Swartz Drive • Hazard • Kentucky • 41701
Phone (606) 551-1050

EAST KENTUCKY ENGINEERING, LLC.

APPALACHIAN WIRELESS
Geotechnical Investigation on the Campton North Tower Site
Wolfe County, Kentucky
EKYENG Project No. 165-000-0117

PREPARED FOR:
Appalachian Wireless.
101 Technology Trail
Ivel, Kentucky 41642

PREPARED BY:
Richard Dirk Smith PE, PLS
President
East Kentucky Engineering
230 Swartz Drive
Hazard, Kentucky 41701

_____, 20215, October 6th, 2020

EXECUTIVE SUMMARY

A geotechnical investigation has been performed on the Campton North Tower Site, located in Wolfe County, Kentucky. This site is readily accessible. A location map is shown in Figure 1 of this report. One (1) boring was advanced to a maximum depth of 31.4 ft. The following geotechnical considerations were identified:

- Borings utilized for this study encountered sandy silt to 2.5 ft, brown weathered shale to 12.2 ft, sandstone to 21.9 ft, gray shale to 25.4 ft., sandstone to 27.2 ft., and gray shale to 31.4 ft.
- This site is on a forested point.
- **The allowable bearing capacities of the brown weathered shale are estimated at 3 tsf, the sandstone is estimated at 8 tsf and the gray shale is 4 tsf. See section 5.2 for additional details.**
- The 2015 International Building Code seismic site classification for this site **is "A".**
- If during the foundation design it becomes necessary to lower, raise, or change the footer configuration, alternate design recommendations can be provided by EKYENG.
- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We, therefore, recommend that EKYENG is retained to monitor this portion of the work.

This executive summary is included to provide a general overview of the project and should not be relied upon except for the purpose it was prepared. Please rely on the complete report for the information on the findings, recommendations, and all other concerns.

1. INTRODUCTION

East Kentucky Engineering (EKYENG) was retained by Mr. Stanton Neece of Appalachian Wireless to prepare a geotechnical engineering report for the proposed tower site located on the Campton North Property, in Wolfe County, Kentucky. A site location map is shown in Figure No. 1.

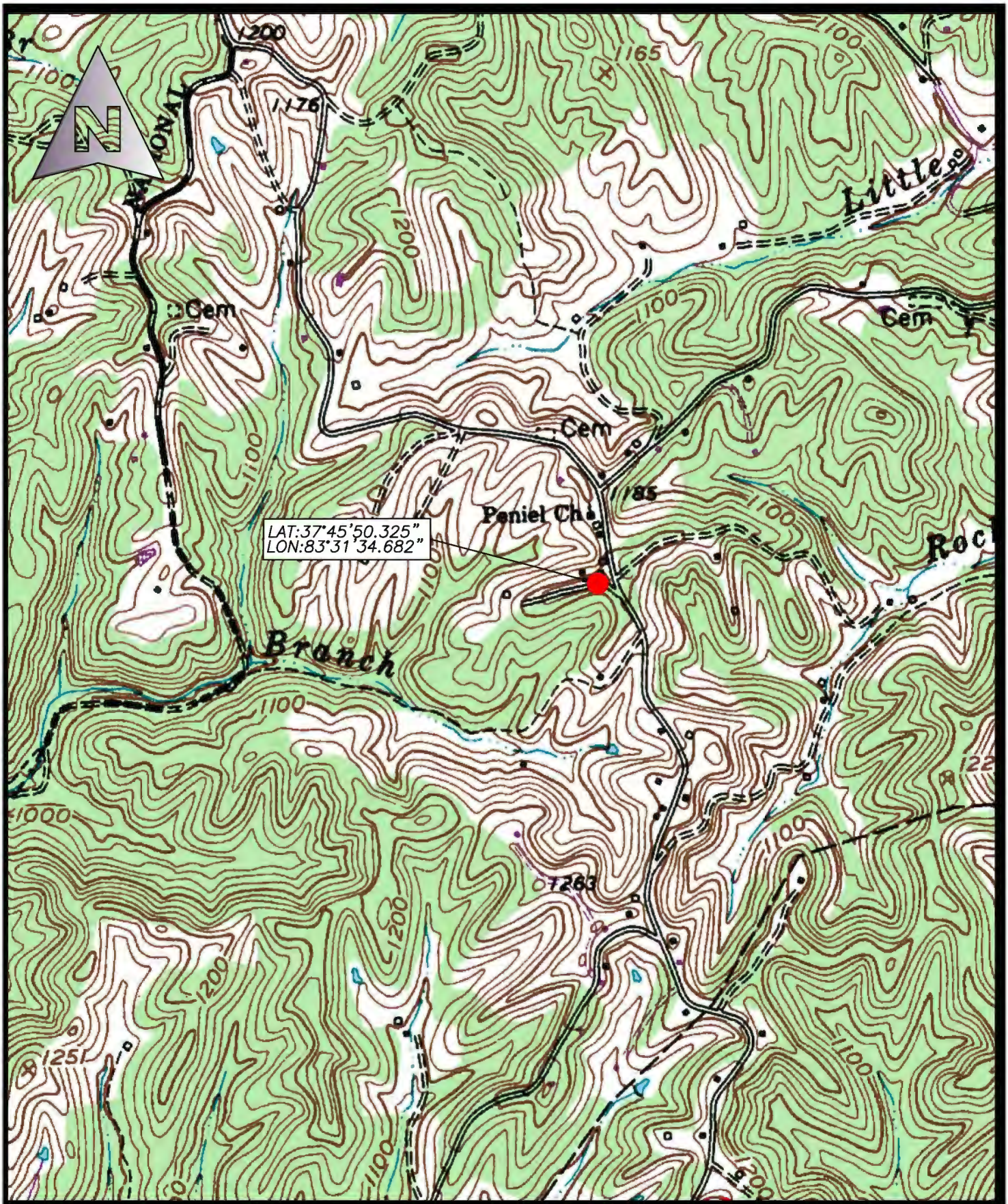
One (1) boring was advanced to a maximum depth of 31.4 ft. Horn and Associates, Inc. provided drilling services to obtain these borings. Logs of the borings along with a boring location plan are included in Appendix A and Appendix D. The purpose of these services is to provide information and geotechnical engineering recommendations about subsurface conditions, earthwork, seismic considerations, groundwater conditions, and foundation design.

2.0 PROJECT DESCRIPTION

The proposed communication facility will consist of a self-supporting tower of undetermined height and ancillary support areas. The footing area is estimated to be an 8 ft diameter pier, with a base of the tower elevation at 1216'. Based on the information provided, we estimate the structural loads will be like the following conditions.

CONDITION	LOAD
Total Shear	40 Kips
Axial Load	50 Kips

We anticipate that overturning will govern the structural design. If the loading is significantly different than these expected values, EKYENG should be notified to re-evaluate the recommendations provided in this report.



Drawn:RDS	9/16/2020
Job:165–117	Scale:1"=1000'

APPALACHIAN WIRELESS
EXCERPT FROM USGS QUAD
LOCATION MAP
CAMPTON TOWER SITE
FIGURE NO 1

East Kentucky Engineering,LLC.
230 Swartz Drive
Hazard, KY 41701
(606) 551–1050

3.0 SITE DESCRIPTION & HISTORICAL MINING

3.1 GENERAL INFORMATION

The site location is on a forested point in Wolfe County, Kentucky. The current surface elevation is approximately 1216.0 ft. Research on the historical mining was conducted by obtaining previous mine license maps from the "Kentucky Mine Mapping Information System" (KMMIS).

3.2 SURFACE MINING

No issues from surface mining activities are expected at this site location.

3.3 UNDERGROUND MINING

No underground mines were found within the vicinity of this site. Therefore, no subsidence issues are anticipated.

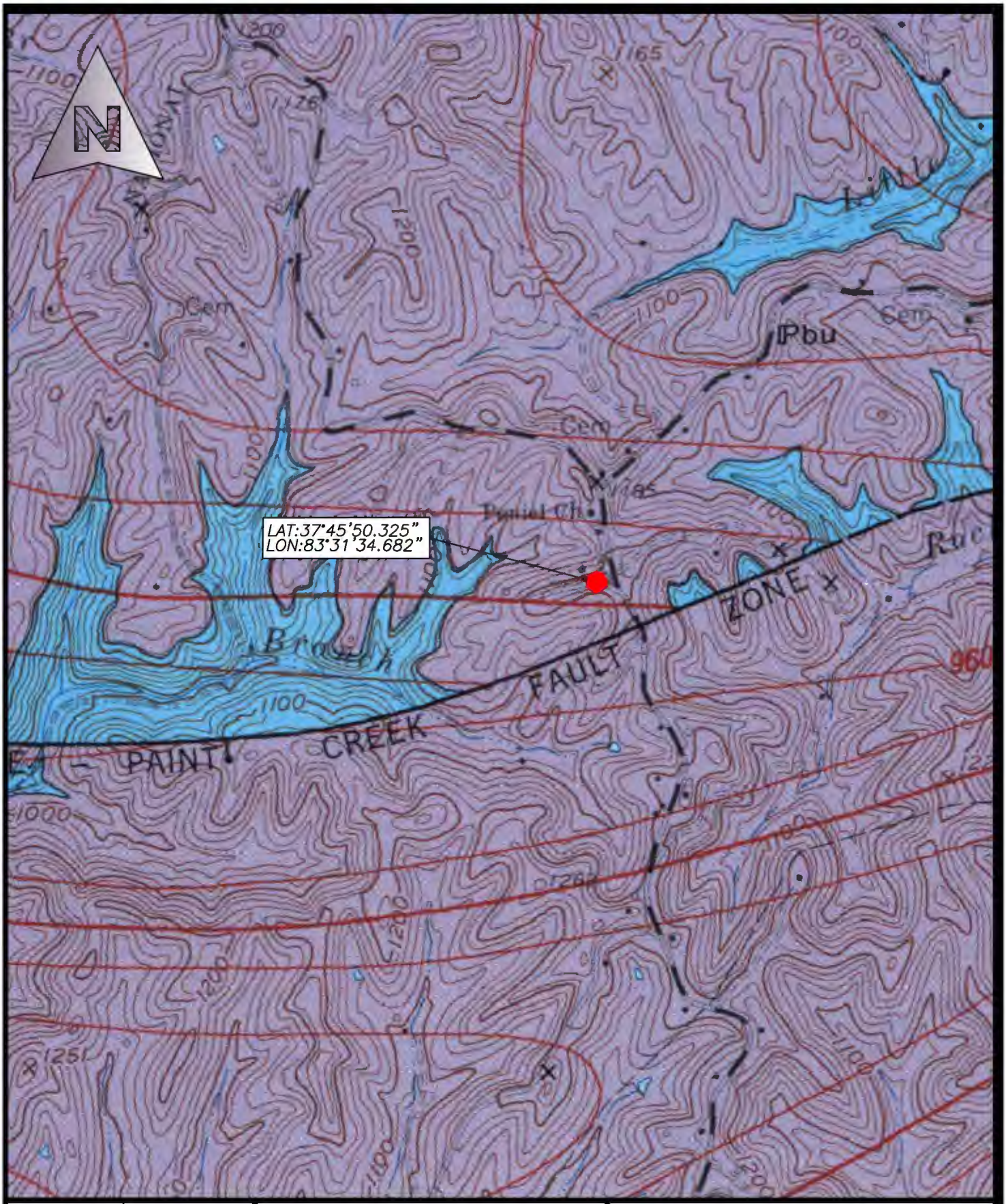
3.4 FLOOD HAZARD

A potential flood determination was conducted by EKYENG. For this determination, the FEMA Flood Map Service was reviewed for this location. The flood map for the selected area is number **21237C0050C-210349.** The flood zone for this area is Zone X and is an area of minimal flood hazard. A FIRMette map is included in Appendix E of this report.

4.0 FIELD EXPLORATION

4.1 SITE INFORMATION

The proposed site is located on a forested point in Wolfe County, Kentucky. The site lies within the Pomeroyton Quadrangle. The site is readily accessible by conventional exploratory equipment. An estimated pad location was determined based on the information provided. Foundation dimensions were estimated to be an 8 ft. diameter circular pier footer for this report.



Drawn:RDS	9/16/2020
Job:165-117	Scale:1"=1000'

APPALACHIAN WIRELESS
EXCERPT FROM GEOLOGIC QUAD
LOCATION MAP
CAMPTON TOWER SITE
FIGURE NO 2

East Kentucky Engineering,LLC.
230 Swartz Drive
Hazard, KY 41701
(606) 551-1050

4.2 BORING DATA

One (1) boring was made in the relative position shown on the Site Map in Appendix D. The boring logs and resulting data are included in Appendix A. This boring was made with a track-mounted boring rig using hollow-stem augers and employing standard penetration resistance methods (ASTM D-1586, which includes 140-pound hammer, 30-inch drop, and two-inch-O.D. split-spoon sampler) at maximum depth intervals of five feet or at major changes in stratum, whichever occurred first. The disturbed split-spoon samples were visually classified, logged, sealed in moisture-proof jars, and taken to the EKYENG laboratory for study. The depths where these "A"-type split-spoon samples were collected are noted on the boring logs. The results of the natural moisture contents by boring and interval are shown in Table 2.

TABLE 2
RESULTS OF NATURAL MOISTURE CONTENT TESTS (ASTM D-4643)

SAMPLE NO.	DEPTH INCREMENT, (FT.)	NATURAL MOISTURE CONTENT, %
B1 S-1	1.5 – 3.0	12.7%
B1 S-2	4.0 – 5.5	12.7%
B1 S-3	6.5 – 8.0	12.3%
B1 S-4	9.0 – 10.5	13.8%
B1 S-5	11.5 – 12.2	11.3%

The position at which the core was taken is indicated on the boring logs and shown on the sitemap in Appendix D. The corresponding blow counts are shown in Table No. 3.

TABLE NO. 3

STANDARD PENETRATIONS

SAMPLE NO.	DEPTH INCREMENT	BLOW COUNT / RQD *	DESCRIPTION
B-1	0.0-2.5	8-7-19	Sandy Silt w/ Veg Organics
B-1	2.5-12.2	12-17-19	Shale, Brown, Weathered
B-1	12.2-21.9	95*	Sandstone
B-1	21.9-25.4	92*	Shale, Gray
B-1	25.4-27.2	92*	Sandstone
B-1	27.2-31.4	92*	Shale, Gray

The boring encountered weathered shale and sandstone. This boring was extended by “NX” size rock core that was taken to confirm the presence of rock at the site and to determine its physical characteristics. The core was made with “NX” size diamond coring equipment. This boring is between 12.2 ft and 31.4 ft in depth. The position at which the core was taken is indicated on the boring logs and shown on the boring location map in Appendix D.

4.3 GROUNDWATER

Groundwater in Eastern Kentucky is characterized by water flowing through a system of internal fractures that lead to an alluvial aquifer near the bottom of valley floors. Large, defined aquifers other than the alluvium is not common, especially in higher elevations such as where this tower site is proposed. Therefore, groundwater should not be a concern in this area. During the site investigation, no groundwater resources were observed.

4.4 SEISMIC SITE CLASSIFICATION

Based on the encountered soil conditions at the project site, the site classification was determined to be "Site Class A" per the 2018 Kentucky Building Code. In addition, an S_{DS} coefficient of 0.105 g was calculated, and an S_{D1} coefficient of

0.047 g was also calculated for design based on the aforementioned building code.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 GENERAL

The structure will be a self-supporting free-standing monopole tower. Due to wind loading, lattice tower foundations can experience both vertical loads and horizontal loads. The vertical loads act in both an upward and downward direction as the tower attempts to overturn and can act in any directions.

5.2 DRILLED PIER FOUNDATION RECOMMENDATIONS

If drilled piers are used for foundation support, we recommend the following design parameters.

TABLE NO. 1

Approx. Depth (ft.)	Allowable Skin Friction (psf.)	Allowable End Bearing Pressure (psf.)	Effective Unit Weight (pcf.)	Cohesion (psf.)	Internal Angle of Friction (Degrees)
0 – 6.8	To Be Removed				
Brown Weathered Shale 6.8– 12.2	1200	6000	150	----------	24
Sandstone 12.2 – 21.9	2500	16,000	165	----------	30
Gray Shale 21.9 – 25.4	1500	8,000	150	----------	27

Approx. Depth (ft.)	Allowable Skin Friction (psf.)	Allowable End Bearing Pressure (psf.)	Effective Unit Weight (pcf.)	Cohesion (psf.)	Internal Angle of Friction (Degrees)
Sandstone 25.4 – 27.2	2500	16,000	165	----------	30
Gray Shale 27.2 – 31.4	1500	8,000	150	----------	27

- *The first 12 feet of material will be removed to construct tower pad.*

The skin friction and passive resistance have a factor of safety of 2. The allowable end bearing pressure has an approximate safety factor of 3. If the drilled piers are designed using the above design parameters and socketed into solid bedrock, settlements are not anticipated to exceed ¼ inch.

It is furthermore recommended that other slabs-on-grade be supported on 4 to 6-inch layer of relatively clean granular material such as sand and gravel or crushed stone. This is to help distribute concentrated loads and equalize moisture conditions beneath the slab. Proper drainage must be incorporated into this granular layer to preclude future wet areas in the finished slab-on-grade. However, all topsoil and/or other deleterious materials encountered during site preparation must be removed and replaced with 4000 psi. concrete below the foundation base. Provided that a minimum of 4 inches of granular material is placed below the new slab-on-grade, a modulus of subgrade reaction (k30) of 100 lbs./cu. in. can be used for design of the slabs.

Support structure for this tower can be placed as needed. It is recommended that test pits are examined to ensure that any of these structures are on the competent materials. If pockets of soft, loose or otherwise unsuitable material are

encountered in the footing excavations and it is inconvenient to lower the footings, the proposed footing elevations may be re-established by backfilling after the undesirable material has been removed. The undercut excavation beneath each footing should extend to suitable bearing soils and the dimensions of the excavation base should be determined by imaginary planes extending outward and down on a 1 (vertical) to 1 (horizontal) slope from the base perimeter of the footing. The entire excavation should then be refilled with a well-compacted engineered fill, or lean concrete (Please note that the width of the lean concrete zone should be equal or wider than the width of the overlying footing element). Special care should be exercised to remove any sloughed, loose or soft materials near the base of the excavation slopes. In addition, special care should be taken to "tie-in" the compacted fill with the excavation slopes, with benches as necessary, to ensure that no pockets of loose or soft materials will be left in place along the excavation slopes below the foundation bearing level. All Federal, State, and Local regulations should be strictly adhered to relative to excavation side-slope geometry.

5.3 BURIED UTILITIES

Excavations for buried utility pipelines should follow the guidelines set forth in this report. Depending on the pipeline material, a minimum thickness of at least 0.5 feet of select fine-grained granular bedding material should be used beneath all below-grade pipes, with a minimum cover thickness of at least 3 feet to afford an "arching" effect and reduce stresses on the pipe. The cover thickness may be reduced if the external loading condition on the pipe is relatively light or if the pipe is designed to withstand the external loading condition. It is not recommended that "pea-gravel" or other "open-work" aggregates be used for trench backfill since these materials are nearly impossible to compact and tend to pond water within their interstices.

6.0 WARRANTY

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, express or implied, is made.

While the services of EKYENG are a valuable and integral part of the design and construction teams, we do not warrant, guarantee, or insure the quality or completeness of services provided by other members of those teams, the quality, completeness, or satisfactory performance of construction plans and specifications which we have not prepared, nor the ultimate performance of building site materials.

6.1 SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings, although test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report and is presented on the Boring Location Plan or on the boring log. The location and elevation of the boring should be considered accurate only to the degree inherent with the method used.

The boring log includes sampling information, description of the materials recovered, approximate depth of boundaries between soil and rock strata and groundwater data. The boring log represents conditions specifically at the location and time the boring was made. The boundaries between different soil strata are indicated at specific depths; however, these depths are in fact approximate and are somewhat dependent upon the frequency of sampling (The transition between soil strata is often gradual). Free groundwater level readings are made at the times and under conditions stated on the boring logs

(Groundwater levels change with time and season). The borehole does not always remain open sufficiently long enough for the measured water level to coincide with the groundwater table.

6.2 LABORATORY AND FIELD TESTS

Laboratory and field tests are performed by specific ASTM standards unless otherwise indicated. All determinations included in each ASTM standard are not always required and performed. Each test report indicates the measurements and determinations made.

6.3 ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the engineering design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it is not intended to determine the cost of construction or to stand alone as a construction specification.

Our engineering report recommendations are based primarily on data from test borings made at the locations shown in a boring location drawing included. Soil variations may exist between borings, and these variations may not become evident until construction. If significant variations are then noted, the geotechnical engineer should be contacted so that field conditions can be examined and recommendations revised if necessary.

The geotechnical engineering report states our understanding as to the location, dimensions and structural features proposed for the site. Any significant changes in the nature, design, or location of the site improvements MUST be communicated to the geotechnical engineer such that the geotechnical analysis, conclusions, and recommendations can be appropriately adjusted. The geotechnical engineer should be given the opportunity to review all drawings that have been prepared based on their recommendations.

6.4 CONSTRUCTION MONITORING

Construction monitoring is a vital element of complete geotechnical services. The field engineer/inspector is the owner's "representative" observing the work of the contractor, performing tests as required in the specifications, and reporting data developed from such tests and observations. The field engineer or inspector does not direct the contractor's construction means, methods, operations or personnel. The field inspector/engineer does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The field inspector/engineer is responsible for his own safety but has no responsibility for the safety of other personnel at the site. The field inspector/engineer is an important member of a team whose responsibility is to watch and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications.

6.5 GENERAL

The scope of our services did not include an environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater or air, on, within or beyond the site studied. Any statements in the report or on the boring logs regarding odors, staining of soils or other unusual items or conditions observed are strictly for the information of our client.

To evaluate the site for possible environmental liabilities, we recommend an environmental assessment, consisting of a detailed site reconnaissance, a record review, and report of findings. Additional subsurface drilling and samplings, including groundwater sampling, may be required.

This report has been prepared for the exclusive use of Appalachian Wireless, for specific application to the proposed cellular tower located on the Campton North Property located in Wolfe County, Kentucky. Specific design and construction recommendations have been provided in the various sections of the report. The report shall, therefore, be used in its entirety. This report is not a bidding

document and shall not be used for that purpose. Anyone reviewing this report must interpret and draw their conclusions regarding specific construction techniques and methods that were chosen. EKYENG is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploratory and laboratory test data presented in this report.

SPECIFICATIONS

I – GENERAL

1.0 STANDARDS AND DEFINITIONS

1.1 STANDARDS - All standards refer to latest edition unless otherwise noted.

1.1.1 ASTM D-698-70 (Method C) "Standard Test Methods for Moisture. Density Relations of Soils and Soil Aggregate Mixtures Using 5.5-lb (2.5 kg.) Rammer and 12-inch (305-mm) Drop".

1.1.2 ASTM D-2922 "Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear methods (Shallow Depth)".

1.1.3 ASTM D-1556 "Standard Test Method for Density of Soil in place by the Sand-Cone Method".

1.2 DEFINITIONS

1.2.1 Owner - In these specifications the word "Owner" shall mean Appalachian Wireless.

1.2.2 Engineer - In these specifications the word "Engineer" shall mean the Owner designated engineer.

1.2.3 Design Engineer - In these specifications the words "Design Engineer" shall mean the Owner designated design engineer.

1.2.4 Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any work under the terms of these specifications.

1.2.5 Approved - In these specifications the word "approved" shall refer to the approval of the Engineer or his designated representative.

1.2.6 As Directed - In these specifications the words "as directed" shall refer to the directions to the Contractor from the Owner or his designated representative.

2.0 GENERAL CONDITIONS

2.1 The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction, grading as shown on the plans and as described therein.

This work shall consist of all mobilization clearing and grading, grubbing, stripping, removal of existing material unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications.
This work is to be accomplished under the observation of the Owner or his designated representative.

2.2 Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including, without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site; and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.

If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the owner can investigate the condition.

2.3 The construction shall be performed under the direction of an experienced engineer who is familiar with the design plan.

II - ENGINEERED FILL BENEATH STRUCTURES
CLEARING AND GRADING SPECIFICATIONS

1.0 GENERAL CONDITIONS

The Contractor shall furnish all labor, materials, and equipment, and perform all work and services necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction and grading as shown on the plans and as described therein.

This work shall consist of all clearing and grading, removal of existing structures unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications.

This work is to be accomplished under the constant and continuous supervision of the Owner or his designated representative.

In these specifications, the terms "approved" and "as directed" shall refer to directions to the Contractor from the Owner or his designated representative.

2.0 SUBSURFACE CONDITIONS

Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site; and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work. Borings and/or soil investigations shall have been made. Results of these borings and studies will be made available by the Owner to the Contractor upon his request, but the Owner is not responsible for any interpretations or conclusions with respect thereto made by the Contractor based on such information, and the Owner further has no responsibility for the accuracy of the borings and the soil investigations.

If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the Owner can investigate the condition.

3.0 SITE PREPARATION

Within the specified areas, all trees, brush, stumps, logs, tree roots, and structures scheduled for demolition shall be removed and disposed of.

All cut and fill areas shall be properly stripped. Topsoil will be removed to its full depth and stockpiled for use in finish grading. Any rubbish, organic and other objectionable soils, and other deleterious material shall be disposed of off the site, or as directed by the Owner or his designated representative if on site disposal is

provided. In no case shall such objectionable material be allowed in or under the fill unless specifically authorized in writing.
Prior to the addition of fill, the original ground shall be compacted to job specifications as outlined below. Special notice shall be given to the proposed fill area now. If wet spots, spongy conditions, or groundwater seepage is found, corrective measures must be taken before the placement of fill.

4.0 FORMATION OF FILL AREAS

Fills shall be formed of satisfactory materials placed in successive horizontal layers of not more than eight (8) inches in loose depth for the full width of the cross-section. The depth of lift may be increased if the Contractor can demonstrate the ability to compact a larger lift. If compaction is accomplished using hand-tamping equipment, lifts will be limited to 4-inch loose lifts. Engineered fill placed below the structure bearing elevation shall be compacted to at least 95% of the maximum dry unit weight with a moisture content within 2% of the optimum moisture content as determined by the modified Proctor test. The top size of the material placed shall not exceed 4 inches.

All material entering the fill shall be free of organic matter such as leaves, grass, roots, and other objectionable material.

The operations on earth work shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing weather, or other unsatisfactory conditions. The Contractor shall keep the work areas graded to provide the drainage always.

The fill material shall be of the proper moisture content before compaction efforts are started. Wetting or drying of the material and manipulation to secure a uniform moisture content throughout the layer shall be required. Should the material be too wet to permit proper compaction or rolling, all work thus affected shall be delayed until the material has dried to the required moisture content. The moisture content of the fill material should be no more than two (2) percentage points higher or lower than optimum unless otherwise authorized. Sprinkling shall be done with equipment that will satisfactorily distribute the water over the disced area. Any areas inaccessible to a roller shall be consolidated and compacted by mechanical tampers. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.

In the construction of filled areas, starting layers shall be placed in the deepest portion of the fill, and as placement progresses, additional layers shall be constructed in horizontal planes. Original slopes shall be continuously, vertically benched to provide horizontal fill planes. The size of the benches shall be formed so that the base of the bench is horizontal, and the back of the bench is vertical. As many benches as are necessary to bring the site to final grade shall be constructed. Filling operations shall begin on the lowest bench, with the fill being

placed in horizontal eight (8) inch thick loose lifts unless otherwise authorized. The filling shall progress in this manner until the entire first bench has been filled, before any fill is placed on the succeeding benches. Proper drainage shall be maintained always during benching and filling of the benches, to ensure that all water is drained away from the fill area.

Frozen material shall not be placed in the fill nor shall the fill be placed upon frozen material.

The Contractor shall be responsible for the stability of all fills made under the contract, and shall replace any portion, which in the opinion of the Owner or his designated representative, has become displaced due to carelessness or negligence on the part of the Contractor. Fill damaged by inclement weather shall be repaired at the Contractor's expense.

5.0 SLOPE RATIO AND STORM WATER RUN-OFF

Slopes shall not be greater than 2 (horizontal) to 1 (vertical) in both cut and fill, or as illustrated on the construction drawings. Excavations shall be constructed in accordance with all Federal, State and local codes relative to slope geometry.

6.0 GRADING

The Contractor shall furnish, operate, and maintain such equipment as is necessary to construct uniform layers, and control smoothness of grade for maximum compaction and drainage.

7.0 COMPACTING

The compaction equipment shall be approved equipment of such design, weight, and quantity to obtain the required density in accordance with these specifications.

8.0 TESTING AND INSPECTION SERVICES

Testing and inspection services will be provided by the Owner.

GUIDELINES FOR EXCAVATIONS AND TRENCHES

The following represents some general guidelines relative to the design and construction of excavations and trenches. It must be emphasized that these guidelines are not intended to represent a "safety plan," but rather are presented herein to provide general guidance regarding the design characteristics and safety measures for excavations and trenches.

1. Check with the following utilities prior to breaking ground:

- Sewer
- Telephone
- Fuel
- Electric
- Water
- Gas
- Cable

When utility companies or owners do not respond to your request within 48 hours, the contractor may only then proceed provided the contractor does so with caution by using detection equipment or other acceptable means to locate utility installations.

Once the excavation is open, the contractor should protect and support the exposed underground utilities or remove installations to safeguard workers and prevent damage to exposed utilities.

2. Access and egress ramps must be designed by a "competent person" and structural ramps used for equipment must be designed by a "competent person" with qualified knowledge in structural design. In addition:

- Ramps must be secured to prevent displacement;
- Ramps used in lieu of steps must have cleats to prevent slipping; and
- Trenching excavations four feet or greater in depth must have a stairway, ladder, ramps or other safe means to egress with lateral travel no more than 25 feet.

3. Workers must be provided with reflector garments, such as warning orange or red vests, when exposed to vehicular traffic.

4. Contractors must not allow workers to work under or near equipment when there is danger of falling debris, spillage or equipment-related injuries.

5. Mobile equipment, operating adjacent to an open excavation or approaching the edge of an excavation, must have one of the following when the operator's view is obstructed:

- Warning System
- Mechanical Signals
- Barricades
- Stop Logs
- Hand Signals

6. The contractor must check the atmosphere for hazardous gases and oxygen deficiencies when excavating four feet or greater around landfills, or when hazardous substances are stored nearby, and when the contractor expects there could be any exposure to the workers.

7. When hazardous atmospheric conditions exist, or when conditions could change, the contractor must make emergency rescue equipment readily available including breathing apparatus, safety harnesses with life lines and a basket stretcher.

8. When workers enter bell-bottom pier holes or other deep and confined excavations, the worker must wear (always while performing work in the confined space) a separate life line attached to a harness. The line must be attended by someone above while work is being performed. The worker must check for hazardous atmospheric conditions prior to entry.

9. The contractor must ensure that water does not accumulate in open excavations and must inspect the excavation prior to allowing workers to re-enter after heavy rains.

10. Adjacent structures (buildings, walls, etc.) must be supported or secured to prevent worker exposure to unsafe conditions and damage to existing structures.

.

11. A registered professional engineer must approve operations when a contractor underpins existing structures to ensure worker safety and prevent damage to existing structures.

12. Workers must not be exposed to loose soil and rock or materials in and around excavations. Materials, such as removed soil and rock, must not be stored closer than two feet from the edge of the excavation.

13. Daily inspections of the excavation, the adjacent areas and protective systems must be made by a "competent person" for evidence of possible cave-ins, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions. The "competent person" must

stop work immediately and remove workers from the excavation when conditions change and pose a threat to their safety.

14. Workers must not be exposed to fall hazards associated with excavations. Protective walkways or bridges with standard guard rails must be provided.

15. All wells, pits, shafts etc. must be barricaded or covered. After completion of work, all wells, pits, shafts etc. must be backfilled.

IV - DRILLED PIER INSTALLATION

1.0 DRILLING PROCEDURE

1.1 Drilled piers will be installed with large caisson drill rigs capable of torque and crowd forces sufficient to install drilled piers at the project site given the in-situ soil conditions.

1.2 The drill rig kelly bar and auger will be carefully and accurately placed over the centerline of the drilled pier. The Contractor is responsible for providing necessary surveying to verify drilled pier location before, during, and after the drilled pier installation.

1.3 The augers are advanced downwards as they are rotated such that drilling of the soil mass is efficiently accomplished. Depending on the subsurface conditions, and the requirements for the given project, a temporary steel casing should be installed at this time to preclude caving of the soil and/or broken rock mass being penetrated.

2.0 CASING INSTALLATION

2.1 The casing will be checked for centerline accuracy and plumbness by the Contractor's survey crew. During casing installation, the Contractors survey crew will verify alignment with instruments. If plumbness and alignment are not within tolerance as determined by the Contractors survey crew, the casing will be extracted and re-aligned as necessary.

2.2 The drill rig will remove soil and bedrock material from within the casing to the drilled pier design tip elevation. A steel casing or "Sonotube" shall be inserted into the borehole to preclude cave-ins and/or instability in the borehole.

2.3 The bearing surface within the drilled pier will be inspected by a registered Professional Engineer before being approved for structural concreting.

3.0 INSTALLATION OF THE REBAR CAGE

3.1 An epoxy coated spiral reinforcing steel cage will be installed while in the drilled pier borehole.

3.2 To assist in assuring that the reinforcing steel cage does not settle during concrete pumping, a mat of reinforcing steel bars will be installed across the bottom of the reinforcing steel cage perpendicular to the vertical axis of the cage. The exact number of bars will be determined and installed by the Structural Engineer. The number of rebar boots used on the bottom of the cage will also be determined by the Structural Engineer.

3.3 The reinforcing steel cage will be lowered into the drilled pier borehole, while drilled pier spacers are placed at intervals as required by the Structural Engineer. The reinforcing steel cage will be checked for alignment by the Contractors survey crew.

3.4 The crane will remain attached to the reinforcing steel cage while the concrete pump outlet pipe is lowered to just above the bottom of the drilled pier. The concrete pump pipe sections will be welded together to assure that do not separate during pumping.

4.0 CONCRETING OF THE DRILLED PIER

4.1 Concrete pumping may commence once the bearing surface has been approved in accordance with Clause 2.3

4.2 A three-inch trash pump will be used to pump slurry and/or water from within the casing and from above the newly pumped concrete.

4.3 The concrete pump outlet pipe will maintain at least ten (10) feet of embedment into the fresh concrete. The concrete level in the casing will be monitored.

4.4 The casing will be completely extracted with the crane and/or vibratory hammer. Caisson clamps on the vibratory hammer (if applicable) will be adjusted to the proper dimension to withdrawal the casing.

4.5 The concrete will be terminated at the top of drilled pier elevation and screeded flat.

4.6 The upper reinforcing steel dowel cage will be lowered into the concrete to the embedment elevation. If necessary, the concrete will be vibrated to assist in placement. Alignment will be verified by the Contractors survey crew and the cage will be sufficiently braced.

V - GENERAL CONCRETE SPECIFICATIONS

1.0 GENERAL

It is the intent of this specification to secure, for every part of the work, concrete of homogenous structure which, when hardened, will have the required strength and resistance to weathering. To this end, the limiting values of concrete and the requirements hereinafter specified must be met. Standard tests of the cement, aggregates, concrete and reinforcement will be made by the Owner as it sees fit. The Contractor shall furnish the material for all required samples plus such labor as required to obtain samples. The Contractor shall provide to authorized representatives of the Owner, convenient access to all parts of the work of all concreting operations for the purpose of sampling and inspection.

2.0 SCOPE

Contractor shall furnish all materials, labor, services, transportation, tools, equipment, and related items required to complete work indicated on the drawings and/or specified.

Unless otherwise noted or as modified by more stringent requirements specified herein, all plain and reinforced concrete work shall be performed in full compliance with applicable requirements of the Building Code Requirements for Reinforced Concrete ACI 318.

Contractor shall obtain Owner's approval of all subgrades, footing bottoms, forms, and reinforcement just prior to placing concrete.

Contractor shall coordinate the work specified in this section with that specified in other sections so that all anchors, pipes and other embedded items are properly installed before concrete is placed.

Contractor shall clean all exposed concrete surfaces and obtain approval of Owner for method of cleaning

.

3.0 MATERIALS

All materials shall be of the respective quality specified herein, delivered, stored, and handled as to prevent inclusion of foreign matter and damage by dampness or breakage. Packaged material shall be stored in original container until ready for use. Materials showing evidence of dampness or other damage may be rejected.

A. Fine and Coarse Aggregates: Coarse and fine aggregates shall conform to ASTM Specification C33. The maximum size of aggregate shall not be larger than one-fifth (1/5) of the narrowest dimensions between forms, or larger than three fourths (3/4) of the minimum clear spacing between reinforcement.

1. Fine Aggregate: Sand shall be composed essentially of clean, hard, strong, durable grains free of structurally weak

grains, organic matter, loam, clay, silt, salt, mica or other fine materials that may affect bonding of the cement paste.

2. Coarse Aggregate: Cement concrete shall consist of crushed rock or screened gravel and shall be composed essentially of clean, hard, strong and impermeable particles, resistant to wear and frost and free from deleterious amounts of organic matter, loam, clay, salts, mica, and soft, thin, elongated, laminated or disintegrated stone, and shall be inert to water and cement.

B. Portland Cement: Portland cement shall conform to ASTM Specification C150. Type I or Type II Portland Cement shall be used provided that they are not intermixed during any one batch. Type II Portland Cement shall not be used unless indicated on the plans.

C. Water: Water for mixing and curing shall be clean, fresh, and free from deleterious materials.

D. Metal Reinforcement: Rebar shall be Grade 60 and with deformations conforming to ASTH Specification A305. Welded wire mesh shall conform to W4 x W4 size and be of Grade 60 steel.

E. Admixtures: Except as herein noted, admixtures shall not be used.

1. Under adverse weather conditions only retarding or accelerating agents containing no chloride may be used.

2. Air-Entraining Agent shall be used for all concrete will give an entrained air range of not less than 4 percent but no greater than 8 percent in the finished product. Under no circumstances shall the air-entraining be interground with cement.

3. Approval in writing shall be required from Owner prior to the use of any admixture.

4.0 FORM

Forms shall be constructed with proper shoring and cross-bracing, safeguarding the total structure and specifically lateral stability and sufficiently strong to stand vibrations of concrete and to carry, without appreciable deflection or displacement, all dead and live loads to which they may be subjected.

5.0 INSERTS, ETC.

Anchors, bolts, dowels, conduit, water stops, vent pipes and other similar built-in or concreted-in items shall be properly located, accurately positioned and secured. The Contractor shall cooperate in placing of such items with other contractors who require a fastening device for their work and he shall maintain them in proper location during the progress of his work.

6.0 REINFORCEMENT

Reinforcement at the time concrete is placed shall be free from rust, scale or other coatings that will destroy or reduce the bond.

Reinforcement shall be accurately placed and securely tied at intersections and shall be securely held in position during the placing of concrete by pacers, chairs, or other approved supports.

The reinforcement of foundations, footings and other principal structural members in which the concrete is deposited against the ground shall not have less than three (3) inches of concrete between it and the ground contact surface. If concrete surfaces after removal of the forms are to be exposed to the weather or to be in contact with the ground or rock, reinforcement shall be protected with not less than two (2) inches of concrete,

7.0 CONCRETE

Concrete for the various parts of the work shall be of 4000 pounds per square inch compressive strength with a minimum 28-day cure. Contractor is responsible to provide a mix of not less than 6 bags of cement per yard of concrete and not more than 7 gallons of water per bag of cement, producing a minimum slump of 2-1/2 inches and a maximum slump of 4-1/2 inches. Concrete that exceeds the above range of maximum or minimum slump requirements may be rejected by the Owner. All concrete shall be air-entrained. Contractors are required to furnish the name or names of the company(s) that will be providing the mix. The Owner reserves the right to disapprove any concrete supplier that has been known to supply an undesirable material to the Owner on previous occasions.

8.0 DEPOSITING CONCRETE

4.1. Preparation for Placing Concrete: Before depositing concrete, the Contractor shall:

1. Remove from space to be occupied by concrete all debris, including snow, ice, and water unless otherwise permitted by Owner.

2. Provide diversion, satisfactory to Owner, of any flow of water to an excavation to avoid washing the freshly deposited concrete.

3. Coal the forms prior to placing of reinforcing steel as required in form work.

4. Secure firmly in correct position, all reinforcement and other items to be encased and remove therefrom all coating including ice and frost.

B. Transportation of Concrete from Batch Plant: The concrete shall be delivered to the site of the work and discharge shall be completed within 90 minutes after addition of the cement and water to the aggregates. Each batch of concrete delivered at the job site shall be

accompanied by a time slip issued at the batching plant, bearing the time of charging of the mixer drum with the cement and aggregates.

C. Transporting of Concrete from Mixer to Place of Final Deposit: Transportation shall be done as rapidly as practical by means which shall prevent the separation or loss of the ingredients. If chutes are used, they shall be at a slope not flatter than one vertical to two horizontal. Buggies or carts shall be equipped with pneumatic rubber tires or surfaces of runways shall be sufficiently smooth or both so as not to cause separation or segregation of concrete ingredients. Concrete shall not be allowed to drop freely more than 4 feet. Where greater drops are required, canvas "elephant trunks" or galvanized iron chutes equipped with suitable hopper heads shall be employed and a sufficient number placed to ensure that the concrete may be effectively compacted into horizontal layers not exceeding 12 inches in thickness with minimum lateral movements.

D. Depositing of Concrete: Depositing of concrete shall:

1. Proceed continuously after once starting until reaching the end of a section of construction joint location shown on the drawings, or as approved by the Owner. The operations shall be conducted so that no concrete is deposited on concrete sufficiently hardened to cause formation of seams, and planes of weakness.
2. Be as near as practical to its final position in the forms.
3. Proceed to maintain constantly a top surface which is approximately level.
4. Be placed before initial set has occurred, and in no event after it has contained its water content for more than 90 minutes.
5. Be thoroughly worked and compacted by means of suitable tools to provide impermeability, durability and strength and shall be thoroughly worked around reinforcements and embedded items and into corners of forms and to be free from voids, pockets or honeycombing. Care shall be taken to provide impermeability.

E. Vibration Equipment: Vibration equipment shall be of the appropriate type and shall, always, be adequate in number of units and power of each unit to properly consolidate all concrete.

F. Monolithic Pours: Proper delivery of concrete shall be the Contractor's responsibility to make a mono-lithic pour without delays and changes of cold joints.

9.0 CURING

All concrete work shall be protected from injurious action by the sun, rain, flowing water, frost and other injury and shall be covered with plastic after application of curing compound for three (3) days on pours located above ground.

Contractor shall not remove any formwork for a minimum period of 24 hours after a concrete pour without written approval of the Owner.

10.0 CONCRETE FINISHES

Finishes of all exposed concrete shall be free of defects which impair its durability or adversely affect is appearance. All such surfaces when stripped, shall be uniform in appearance and any surfaces displaying any deviations from adjacent uniform surfaces shall be rejected and subject to removal.

Finished work shall be level and plumb, true to lines, and dimensions. Finished plane surfaces shall be smooth, and as nearly perfect as practical; however, deviations from a true plane shall not exceed 1/8 inch when measured from a 6-foot straight edge placed against the surface to any point on the surface and under the straight edge.

All exposed surfaces shall have defects corrects, protrusions removed, and holes filled.

APPENDIX A BORING LOGS

HORN AND ASSOCIATES, INC
216 N. Main Street - Winchester, KY 40391
Ph: 800-729-2602 Fax: 859-744-5892

FIELD BORING LOG

Page ___ of ___

Project Name	EKE / APP WIRELESS	Hole Number	B-1
Federal Project No.	CAMPTON 2 TOWER	Total Depth	31.4
State Project No.	CAMPTON, KY	Location	AS STAKED
Drilling/Sampling Method	HSA / NX	Surface Elevation	N/A
Boring Diameter	8" / 3"	Date Started	9/4
Driller	J JENKINS	Date Completed	9/4/20
		Weather	

From To	Soil and Rock Description	Sample/Run Interval	Blow Counts/RQD	Sample/Run No.	Sample Type	% Recovery
0.0 - 2.5	SANDY SILT W/ VEG ORGANICS	1.5-3.0	8-7-19	1	SPT	80
2.5 - 12.2	SHALE, BROWN, WEATHERED	4.0-5.5	17-18-23	2	SPT	73
12.2 - 21.9	SANDSTONE	6.5-8.0	14-19-21	3	SPT	87
21.9 - 25.4	SHALE, GRAY	9.0-10.5	12-17-19	4	SPT	93
25.4 - 27.2	SANDSTONE	11.5-12.2	22-50/.2	5	SPT	
27.2 - 31.4	SHALE, GRY					
		12.2-16.4	95	R-1	NX	95
	BORING TERMINATED @	16.4-21.4	78	R-2	↓	98
	31.4'	21.4-26.4	92	R-3	↓	96
		26.4-31.4	92	R-4	↓	96

Water Level @ Drilling NONE | 24 Hr. Water Level | 7 Day Water Level

Moving/Delay Time | Hammer Weight 140 lbs. | Hammer Drop 30 in.

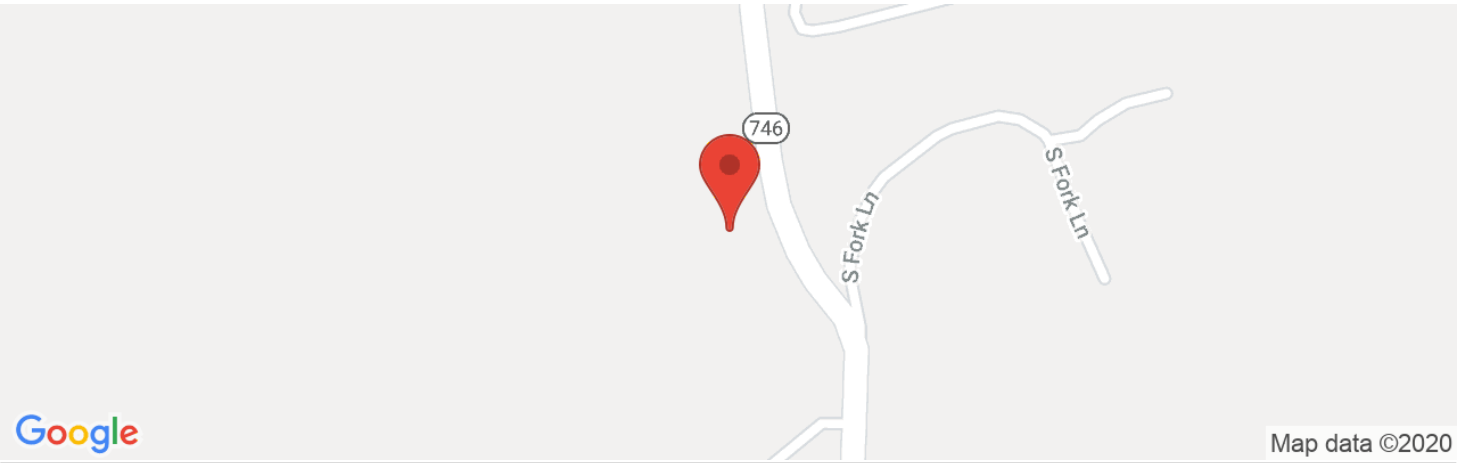
APPENDIX B CORE PHOTOGRAPHS


Campton 2
Hole B-1
21.4 - 31.4
Box 2 of 2
N W/L CORE TOP

APPENDIX C SEISMIC DATA

Campton North

Latitude, Longitude: 37.7640, -83.5263



Date	10/6/2020, 4:23:56 PM
Design Code Reference Document	IBC-2015
Risk Category	IV
Site Class	A - Hard Rock

Type	Value	Description
S_S	0.196	MCE_R ground motion. (for 0.2 second period)
S_1	0.087	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.157	Site-modified spectral acceleration value
S_{M1}	0.07	Site-modified spectral acceleration value
S_{DS}	0.105	Numeric seismic design value at 0.2 second SA
S_{D1}	0.047	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	A	Seismic design category
F_a	0.8	Site amplification factor at 0.2 second
F_v	0.8	Site amplification factor at 1.0 second
PGA	0.096	MCE_G peak ground acceleration
F_{PGA}	0.8	Site amplification factor at PGA
PGA_M	0.077	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	0.196	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.212	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.087	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.097	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.926	Mapped value of the risk coefficient at short periods
C_{R1}	0.903	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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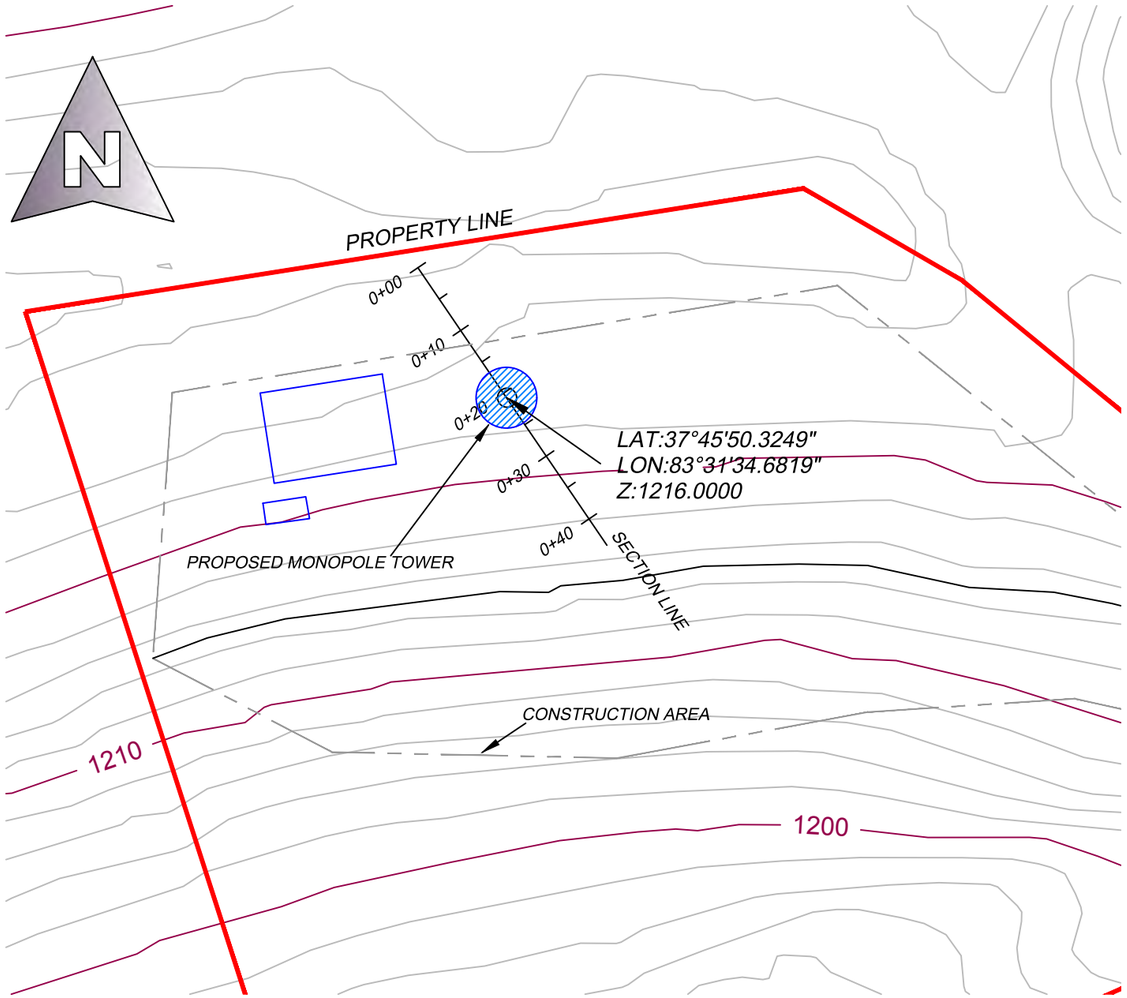
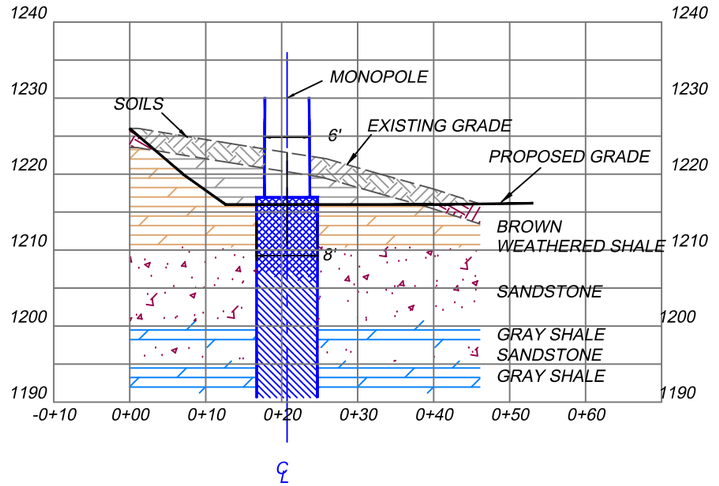
APPENDIX D PHOTOGRAPHS

APPENDIX E
MAPS



PLAN VIEW
1" = 20'



SECTION LINE
1" = 20'

East Kentucky Engineering, LLC
230 Swartz
Hazard, KY 41701
(606) 551-1050
Email: ekyeng@ekyeng.net

STATE OF KENTUCKY
RICHARD D. SMITH
19215
LICENSED PROFESSIONAL ENGINEER
10/5/2020

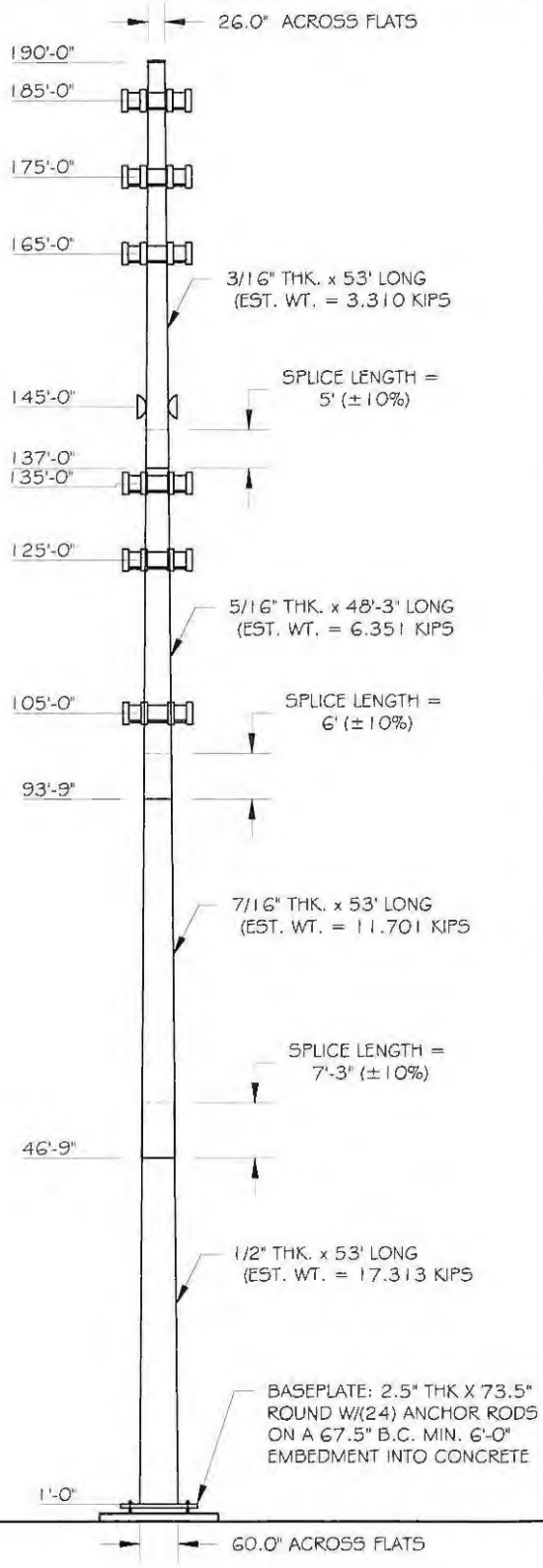
0' 20' 40'

Drawn by:RDS	10/5/2020
Job #:165-000-0117	Scale:1" = AS NOTED
File Location: .	

APPALACHIAN WIRELESS
PROPOSED CAMPTON NORTH TOWER
WOLFE COUNTY
KENTUCKY

Exhibit 5

TAPP
QUALITY STEEL POLES. DELIVERED.
2427 Kelly Lane
Houston, Texas 77066
281-444-8277



Page 1 of 2		Job Number:	23520-441
Eng: MFP		Customer Ref:	TP-19363
		Date:	10/30/2020
Structure:	190-FT MONOPOLE		
Site:	CAMPTON NORTH		
Location:	WOLFE CO., KY / 37°45'50", -83°31'35"		
Owner:	APPALACHIAN WIRELESS		
Revision No.:	Revision Date:		

DESIGN

Building Code:	2018 KENTUCKY BUILDING CODE
Design Standard:	ANSI/TIA-222-G
Wind Speed Load Cases:	ASCE-7-05 CONVERTED TO ASCE-7-10
Load Case #1:	90 MPH Design Wind Speed - V_{ASD} (V_{ULT} = 116 MPH)
Load Case #2:	30 MPH Wind with 0.75" Ice Accumulation
Load Case #3	60 MPH Service Wind Speed

Structure Class Risk Category	Exposure Cat.	Topography Cat.	Crest Height
II	C	1	

STRUCTURE MEETS THE MINIMUM REQUIREMENTS OF TIA-222-H

EQUIPMENT LIST

Elev.	Description
185	(12) NN-65A-M + (12) RRU
185	12-FT PLATFORM WITH HANDRAIL
175	(12) NN-65A-M + (12) RRU
175	12-FT PLATFORM WITH HANDRAIL
165	(12) NN-65A-M + (12) RRU
165	12-FT PLATFORM WITH HANDRAIL
145	(2) 4-FT DISH
145	DUAL MICROWAVE MOUNT
135	(12) NN-65A-M + (12) RRU
135	12-FT PLATFORM WITH HANDRAIL
125	(12) NN-65A-M + (12) RRU
125	12-FT PLATFORM WITH HANDRAIL
105	(12) NN-65A-M + (12) RRU
105	12-FT PLATFORM WITH HANDRAIL

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE

STRUCTURE PROPERTIES

Cross-Section: 18-Sided		Taper:	0.18981 in/ft
Shaft Steel: ASTM A572 GR 65		Baseplate Steel:	ASTM A572 GR 50
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0"			

Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	53.00	0.1875	5.00	26.00	36.06
2	48.25	0.3125	6.00	34.74	43.89
3	53.00	0.4375	7.25	42.13	52.19
4	53.00	0.5000	0.00	49.94	60.00

STATE OF KENTUCKY
MICHAEL F. PLAHOVINSAK
25466
PROFESSIONAL ENGINEER
10.30.2020

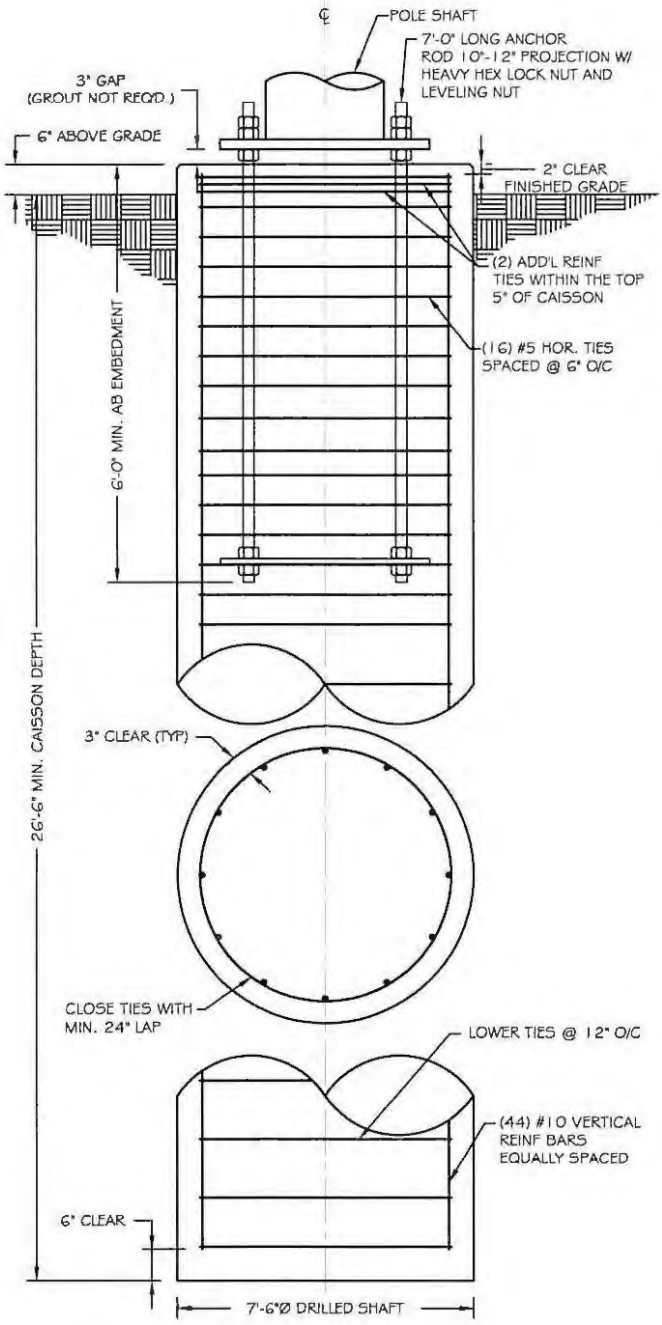
MICHAEL F. PLAHOVINSAK, P.E. #25466
Sole Proprietor – Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

BASE REACTIONS FOR FOUNDATION DESIGN

Moment:	7782 ft-kip
Shear:	57 kip
Axial:	89 kip

TAPP
QUALITY STEEL POLES. DELIVERED.
2427 Kelly Lane
Houston, Texas 77066
281-444-8277

Page 2 of 2		Job Number:	23520-441
Eng: MFP		Customer Ref:	TP-19363
		Date:	10/30/2020
Structure:	190-FT MONOPOLE		
Site:	CAMPTON NORTH		
Location:	WOLFE CO., KY / 37°45'50", -83°31'35"		
Owner:	APPALACHIAN WIRELESS		
Revision No.:	Revision Date:		



CAISSON FOUNDATION

NOT TO SCALE

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. IN AREAS OF POTENTIAL FREEZING, CONCRETE 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: EAST KENTUCKY ENGINEERING
   REPORT NO.: 165-000-0117 (DATED 10/6/20)

6. ESTIMATED CONCRETE VOLUME = 44 CUBIC YARDS.

7. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
   MOMENT: 7782 FT*KIPS
   SHEAR: 57 KIPS
   AXIAL: 89 KIPS

STATE OF KENTUCKY
MICHAEL F. PLAHOVINSAK
25466
PROFESSIONAL ENGINEER
10.30.2020

MICHAEL F. PLAHOVINSAK, P.E. #25466
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

Tower Input Data

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

Tower is located in Wolfe County, Kentucky.
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, feed line 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	190.00-137.00	53.00	5.00	18	26.0000	36.0602	0.1875	0.7500	A572-65 (65 ksi)
L2	137.00-93.75	48.25	6.00	18	34.7361	43.8947	0.3125	1.2500	A572-65 (65 ksi)
L3	93.75-46.75	53.00	7.25	18	42.1308	52.1910	0.4375	1.7500	A572-65 (65 ksi)
L4	46.75-1.00	53.00		18	49.9398	60.0000	0.5000	2.0000	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	26.3722	15.3617	1293.1111	9.1634	13.2080	97.9036	2587.9238	7.6823	4.2460	22.645
	36.5875	21.3487	3470.8616	12.7348	18.3186	189.4723	6946.2902	10.6764	6.0166	32.088
L2	36.1875	34.1439	5111.6801	12.2204	17.6459	289.6802	10230.0864	17.0752	5.5636	17.803
	44.5236	43.2281	10373.4000	15.4717	22.2985	465.2063	20760.4496	21.6181	7.1755	22.961
L3	43.8697	57.8963	12715.1309	14.8011	21.4024	594.0973	25446.9927	28.9537	6.6450	15.189
	52.9286	71.8662	24318.7306	18.3725	26.5130	917.2375	48669.4605	35.9399	8.4156	19.236
L4	52.0305	78.4610	24229.5243	17.5511	25.3694	955.0679	48490.9305	39.2379	7.9094	15.819
	60.8485	94.4265	42234.2974	21.1225	30.4800	1385.6397	84524.1679	47.2222	9.6800	19.36

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
190.00-137.00									
L2				1	1	1			
137.00-93.75									
L3 93.75-46.75				1	1	1			
L4 46.75-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
1 5/8"	C	No	Yes	Inside Pole	185.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	175.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	165.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	145.00 - 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	Yes	Inside Pole	135.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	125.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	105.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	190.00-137.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.90
L2	137.00-93.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.60
L3	93.75-46.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	4.74
L4	46.75-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	4.61

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	190.00-137.00	A	1.759	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.90
L2	137.00-93.75	A	1.699	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.60
L3	93.75-46.75	A	1.617	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	4.74
L4	46.75-1.00	A	1.455	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	4.61

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.62 1.78 1.95	0.08 0.10 0.12
12' Platform w/ Handrail	C	None		0.0000	185.00	No Ice 1/2" Ice 1" Ice	30.00 35.00 40.00	30.00 35.00 40.00	1.80 2.60 3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.62 1.78 1.95	0.08 0.10 0.12
12' Platform w/ Handrail	C	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice	30.00 35.00 40.00	30.00 35.00 40.00	1.80 2.60 3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00	0.0000	165.00	No Ice 1/2" Ice	12.41 12.89	5.04 5.71	0.08 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.62 1.78 1.95	0.08 0.10 0.12
12' Platform w/ Handrail	C	None		0.0000	165.00	No Ice 1/2" Ice 1" Ice	30.00 35.00 40.00	30.00 35.00 40.00	1.80 2.60 3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.62 1.78 1.95	0.08 0.10 0.12
12' Platform w/ Handrail	C	None		0.0000	135.00	No Ice 1/2" Ice 1" Ice	30.00 35.00 40.00	30.00 35.00 40.00	1.80 2.60 3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.62 1.78 1.95	0.08 0.10 0.12
12' Platform w/ Handrail	C	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice	30.00 35.00 40.00	30.00 35.00 40.00	1.80 2.60 3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice 1" Ice	12.41 12.89 13.38	5.04 5.71 6.37	0.08 0.17 0.26
(12) Ericsson RRUS22212-B13	A	From Face	2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	1.86 2.03	1.62 1.78	0.08 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
			0.00			1" Ice	2.20	1.95	0.12
12' Platform w/ Handrail	C	None		0.0000	105.00	No Ice	30.00	30.00	1.80
						1/2" Ice	35.00	35.00	2.60
						1" Ice	40.00	40.00	3.40

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 ft²	Weight K
4 ft standard	A	Paraboloid w/o Radome	From Face	1.00	0.0000		145.00	4.00	No Ice	12.57	0.10
				0.00					1/2" Ice	13.10	0.18
				0.00					1" Ice	13.62	0.25
4 ft standard	B	Paraboloid w/o Radome	From Face	1.00	0.0000		145.00	4.00	No Ice	12.57	0.10
				0.00					1/2" Ice	13.10	0.18
				0.00					1" Ice	13.62	0.25

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	190 - 137	Pole	Max Tension	4	0.00	0.00	-0.01
			Max. Compression	8	-46.79	21.83	13.60
			Max. Mx	4	-15.76	-792.23	-1.43
			Max. My	2	-15.89	15.11	800.13
			Max. Vy	4	26.71	-792.23	-1.43
			Max. Vx	6	26.46	4.43	-789.92
			Max. Torque	6			-7.28
L2	137 - 93.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-97.88	46.27	27.82

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	4	-39.05	-2433.53	-25.16
			Max. My	2	-39.18	36.66	2423.05
			Max. Vy	4	50.26	-2433.53	-25.16
			Max. Vx	6	49.84	5.83	-2421.31
			Max. Torque	6			-13.98
L3	93.75 - 46.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-121.30	49.58	29.81
			Max. Mx	4	-59.41	-4829.15	-60.56
			Max. My	6	-59.45	-7.05	-4797.69
			Max. Vy	4	54.17	-4829.15	-60.56
			Max. Vx	6	53.75	-7.05	-4797.69
			Max. Torque	6			-13.96
L4	46.75 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-154.67	50.77	30.53
			Max. Mx	4	-89.13	-7781.69	-100.65
			Max. My	6	-89.13	-22.28	-7728.46
			Max. Vy	4	56.62	-7781.69	-100.65
			Max. Vx	6	56.22	-22.28	-7728.46
			Max. Torque	6			-13.88

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 137	49.800	12	2.2953	0.0190
L2	142 - 93.75	27.906	12	1.8991	0.0104
L3	99.75 - 46.75	13.463	12	1.2969	0.0051
L4	54 - 1	3.866	12	0.6646	0.0019

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	(4) Andrew NN-65A-M w/ mount pipe	12	47.395	2.2625	0.0180	36846
175.00	(4) Andrew NN-65A-M w/ mount pipe	12	42.619	2.1946	0.0162	12281
165.00	(4) Andrew NN-65A-M w/ mount pipe	12	37.940	2.1201	0.0143	7368
145.00	4 ft standard	12	29.137	1.9332	0.0109	4097
135.00	(4) Andrew NN-65A-M w/ mount pipe	12	25.140	1.8126	0.0094	3895
125.00	(4) Andrew NN-65A-M w/ mount pipe	12	21.451	1.6753	0.0080	3984
105.00	(4) Andrew NN-65A-M w/ mount pipe	12	14.971	1.3759	0.0056	4174

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	190 - 137	201.351	4	9.1963	0.0759
L2	142 - 93.75	113.548	4	7.6971	0.0416
L3	99.75 - 46.75	54.979	4	5.2886	0.0203
L4	54 - 1	15.819	4	2.7187	0.0078

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	(4) Andrew NN-65A-M w/ mount pipe	4	191.728	9.0761	0.0721	9748
175.00	(4) Andrew NN-65A-M w/ mount pipe	4	172.609	8.8262	0.0645	3246
165.00	(4) Andrew NN-65A-M w/ mount pipe	4	153.866	8.5479	0.0572	1944
145.00	4 ft standard	4	118.511	7.8304	0.0435	1074
135.00	(4) Andrew NN-65A-M w/ mount pipe	4	102.386	7.3560	0.0373	1014
125.00	(4) Andrew NN-65A-M w/ mount pipe	4	87.454	6.8096	0.0318	1028
105.00	(4) Andrew NN-65A-M w/ mount pipe	4	61.121	5.6075	0.0224	1055

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	190 - 137 (1)	TP36.0602x26x0.1875	53.00	0.00	0.0	20.7839	-15.89	1210.38	0.013
L2	137 - 93.75 (2)	TP43.8947x34.7361x0.3125	48.25	0.00	0.0	42.0984	-39.05	2847.26	0.014
L3	93.75 - 46.75 (3)	TP52.191x42.1308x0.4375	53.00	0.00	0.0	69.9552	-59.41	5000.71	0.012
L4	46.75 - 1 (4)	TP60x49.9398x0.5	53.00	0.00	0.0	94.4265	-89.13	6682.26	0.013

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	190 - 137 (1)	TP36.0602x26x0.1875	800.27	871.38	0.918	0.00	871.38	0.000
L2	137 - 93.75 (2)	TP43.8947x34.7361x0.3125	2433.67	2486.24	0.979	0.00	2486.24	0.000
L3	93.75 - 46.75 (3)	TP52.191x42.1308x0.4375	4829.53	5176.11	0.933	0.00	5176.11	0.000
L4	46.75 - 1 (4)	TP60x49.9398x0.5	7782.34	8171.44	0.952	0.00	8171.44	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	190 - 137 (1)	TP36.0602x26x0.1875	25.97	605.19	0.043	7.24	1746.31	0.004
L2	137 - 93.75 (2)	TP43.8947x34.7361x0.3125	50.27	1423.63	0.035	8.72	4984.10	0.002
L3	93.75 - 46.75 (3)	TP52.191x42.1308x0.4375	54.18	2500.35	0.022	8.67	10378.42	0.001
L4	46.75 - 1 (4)	TP60x49.9398x0.5	56.63	3341.13	0.017	8.64	16383.58	0.001

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	190 - 137 (1)	0.013	0.918	0.000	0.043	0.004	0.934 ✔	1.000	4.8.2 ✔
L2	137 - 93.75 (2)	0.014	0.979	0.000	0.035	0.002	0.994 ✔	1.000	4.8.2 ✔
L3	93.75 - 46.75 (3)	0.012	0.933	0.000	0.022	0.001	0.945 ✔	1.000	4.8.2 ✔
L4	46.75 - 1 (4)	0.013	0.952	0.000	0.017	0.001	0.966 ✔	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	190 - 137	Pole	TP36.0602x26x0.1875	1	-15.89	1210.38	93.4	Pass
L2	137 - 93.75	Pole	TP43.8947x34.7361x0.3125	2	-39.05	2847.26	99.4	Pass
L3	93.75 - 46.75	Pole	TP52.191x42.1308x0.4375	3	-59.41	5000.71	94.5	Pass
L4	46.75 - 1	Pole	TP60x49.9398x0.5	4	-89.13	6682.26	96.6	Pass
							Summary	
							Pole (L2) 99.4	Pass
							RATING = 99.4	**Pass**

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Job	Page
190-ft monopole - MFP #23520-441	BP & AB Calc
Project	**Date**
Campton North	10/30/2020
Client	**Designed by**
TAPP TP-19363	Mike

Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G

Factored Base Reactions:		*Pole Shape:*	*Anchor Rods:*	*Base Plate:*
Moment:	7782 ft-kips	18-Sided	(24) 2.25 in. A615 GR. 75	2.5 in. x 73.5 in. Round
Shear:	57 kips	*Pole Dia. (D_f):*	Anchor Rods Evenly Spaced	fy = 50 ksi
Axial:	89 kips	60.00 in	On a 67.5 in Bolt Circle	

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

ϕ_t , ϕ_v = 0.80 TIA 4.9.9
I_{bolts} = 13668.75 in^2 Momet of Inertia
P_u = 234 kips Compr Force
V_u = 2.4 kips Shear Force
Rnt = 325.00 kips Nominal Tensile Strength
n 0.50 for detail type (d)
Stress Rating = **91.9%** Satisfies TIA-G 4.9.9

Base Plate Calculation According to TIA-222-G

ϕ = 0.90 TIA 4.7
M_{PL} = 538.5 in-kip Plate Moment
L = 7.9 in Section Length
Z = 12.3 Plastic Section Modulus
M_P = 613.6 in-kip Plastic Moment
ϕM_n = 552.2 in-kip Factored Resistance

Calculated Moment vs Factored Resistance
538.47 in-kip $\leq$ 552 in-kip

Stress Rating = **97.5%**

Anchor Rods Are Adequate	**91.9%** ☑
Base Plate is Adequate	**97.5%** ☑

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Job	Page
190-ft monopole - MFP #23520-441	FND
Project	**Date**
Campton North	10/30/2020
Client	**Designed by**
TAPP TP-19363	Mike

Caisson Calculation

According to ANSI/TIA-222-G

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 22.5 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 has been designed with factored loads per TIA-222-G.
5. No groundwater within the depth of the foundation.

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

DIAMETER (ft) = 7.500 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	7.00	0.00	100.0		1.000	-0.00
2	S	5.00	7.00	150.0		2.371	24.00
3	S	10.00	12.00	165.0		3.000	30.00
4	S	3.50	22.00	150.0		2.663	27.00
5	S	1.50	25.50	165.0		3.000	30.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 7782.0 VERTICAL (k) = 89.0 SHEAR (k) = 57.0
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33

*** CALCULATED PIER LENGTH (ft) = 27.000

*** 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	7.00	100.0		1.000	55.13	5.17
S	7.50	5.00	150.0		2.371	286.74	10.29
S	12.50	7.86	165.0		3.000	1112.98	16.83
S	20.36	2.14	165.0		3.000	-422.64	21.45
S	22.50	3.50	150.0		2.663	-705.15	24.30
S	26.00	1.00	165.0		3.000	-250.26	26.50

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	WITH THE ADDITIONAL SAFETY FACTOR MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	WITHOUT ADDITIONAL SAFETY FACTOR MOMENT (ft-k)
0.00	76.8	10859.6	57.6	8144.9
2.70	71.4	11063.0	53.5	8297.4
5.40	49.8	11230.2	37.3	8422.8
8.10	-2.2	11312.9	-1.6	8484.9
10.80	-145.1	11127.2	-108.9	8345.6
13.50	-368.5	10465.9	-276.4	7849.6
16.20	-703.4	9037.0	-527.6	6778.0
18.90	-1119.6	6594.2	-839.7	4945.8
21.60	-1139.2	3211.3	-854.4	2408.6
24.30	-606.5	858.0	-454.9	643.5
27.00	0.0	-0.0	0.0	-0.0

*** TOTAL REINFORCEMENT PCT = 0.84 REINFORCEMENT AREA (in^2) = 53.44
*** USABLE AXIAL CAP. (k) = 89.0 USABLE MOMENT CAP. (ft-k) = 8579.8

For Design:

7.5-ft Diameter caisson x 27-ft long (26.5-ft Embeded with 0.5-ft above grade)
Concrete strength =4000 PSI @ 28 days. Estimated Concrete Volume = 44 CY3.
(44) #10 Vertical Rebar. Steel Cross-Section = 55.88 in2

Exhibit 6

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ASO-25415-OE

Issued Date: 09/17/2020

Cindy D. McCarty
East Kentucky Network, LLC
101 Technology Trail
Ivel, KY 41642

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Antenna Tower Campton
Location:	Campton, KY
Latitude:	37-45-50.32N NAD 83
Longitude:	83-31-34.68W
Heights:	1216 feet site elevation (SE)
	199 feet above ground level (AGL)
	1415 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 03/17/2022 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (718) 553-2611, or angelique.eersteling@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ASO-25415-OE.

Signature Control No: 449110220-451188875 (DNE)
Angelique Eersteling
Technician

Attachment(s)
Case Description
Frequency Data
Map(s)

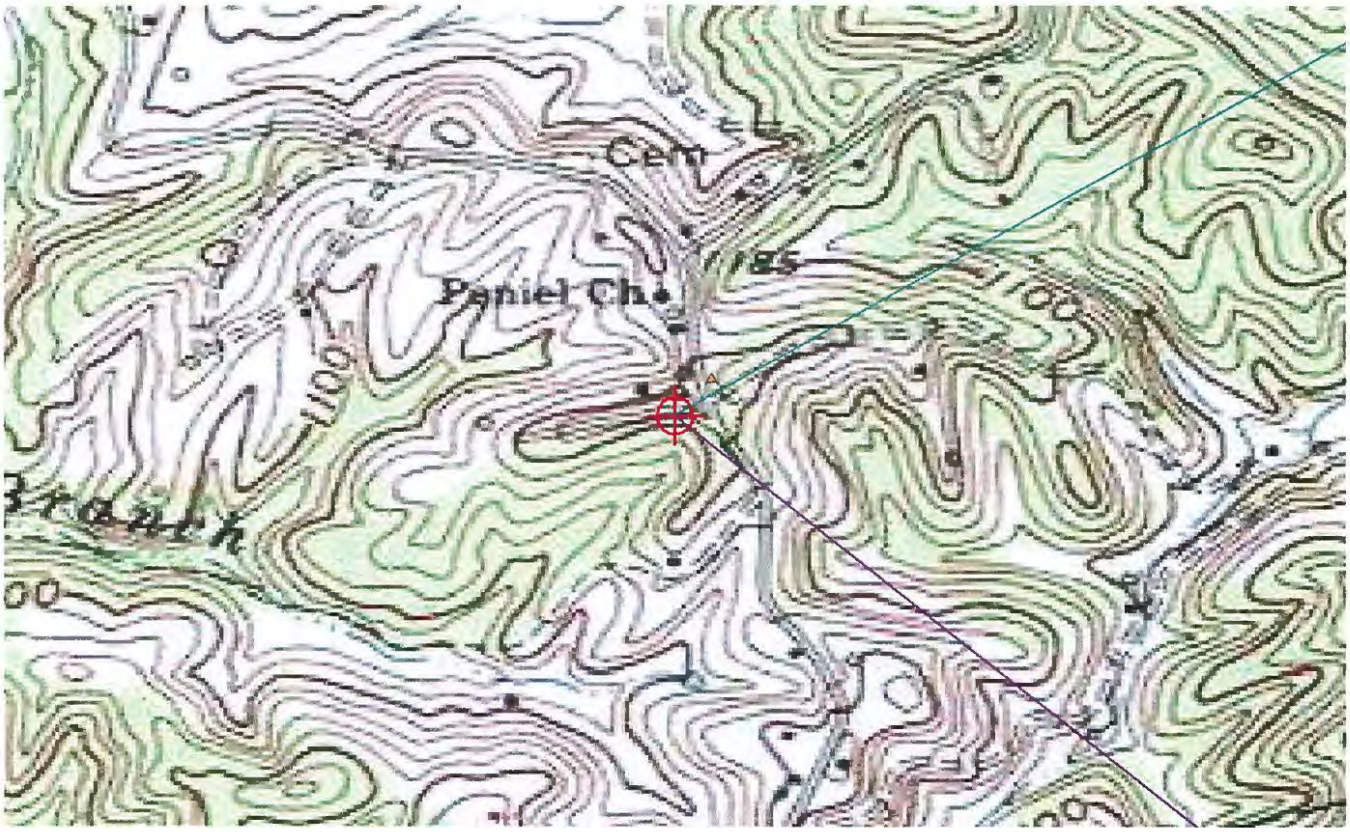
cc: FCC

Case Description for ASN 2020-ASO-25415-OE

A new 190' structure with top- mounted antennas or other appurtenances (overall height of 199' AGL).

Frequency Data for ASN 2020-ASO-25415-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
6	7	GHz	42	dBW
10	11.7	GHz	55	dBW
10	11.7	GHz	42	dBW
17.7	19.7	GHz	55	dBW
17.7	19.7	GHz	42	dBW
21.2	23.6	GHz	55	dBW
21.2	23.6	GHz	42	dBW
614	698	MHz	1000	W
614	698	MHz	2000	W
698	806	MHz	1000	W
806	901	MHz	500	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
929	932	MHz	3500	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1670	1675	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2360	MHz	2000	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W


Cem
Paniel Ch.
185
100
Branch
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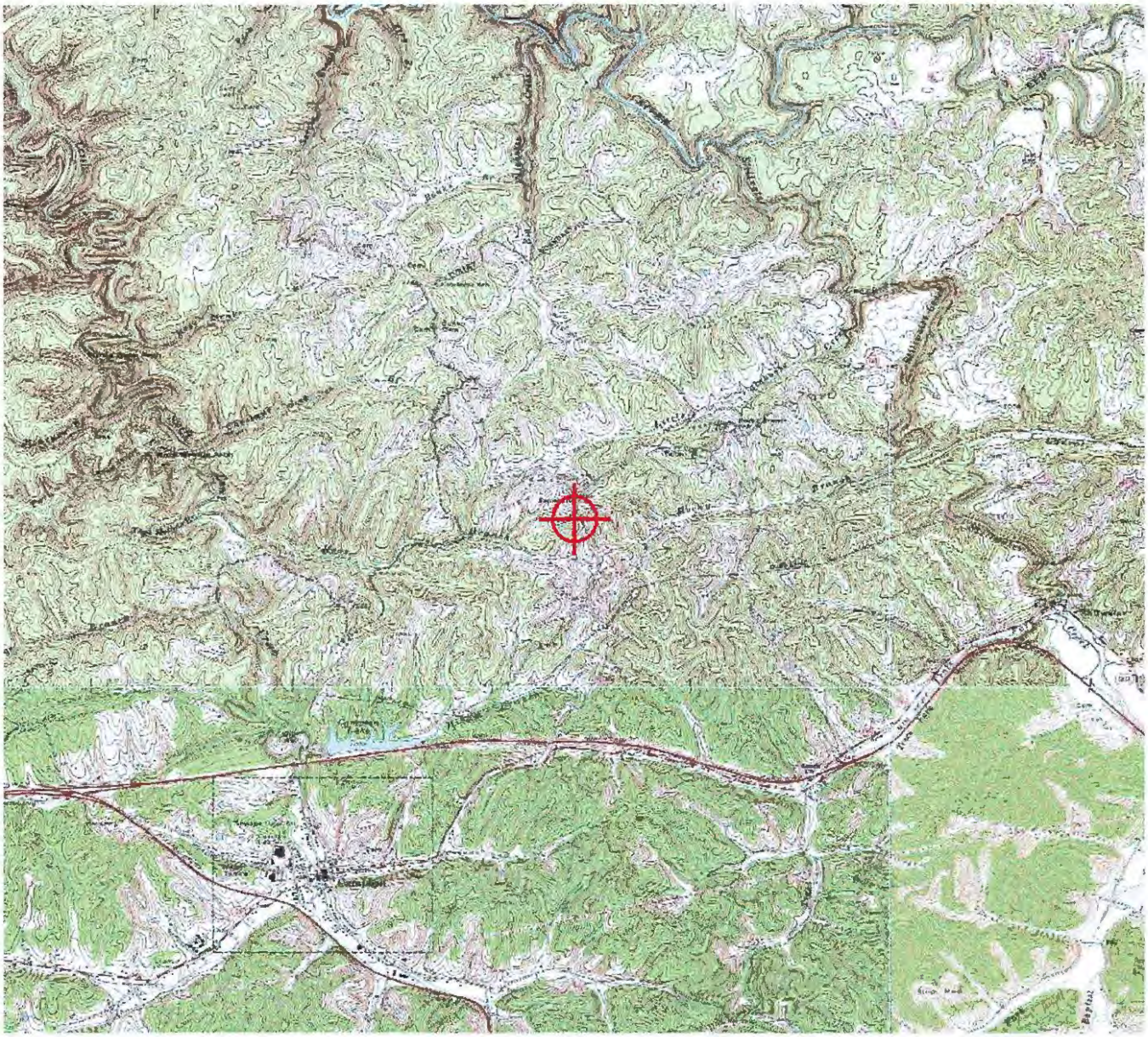
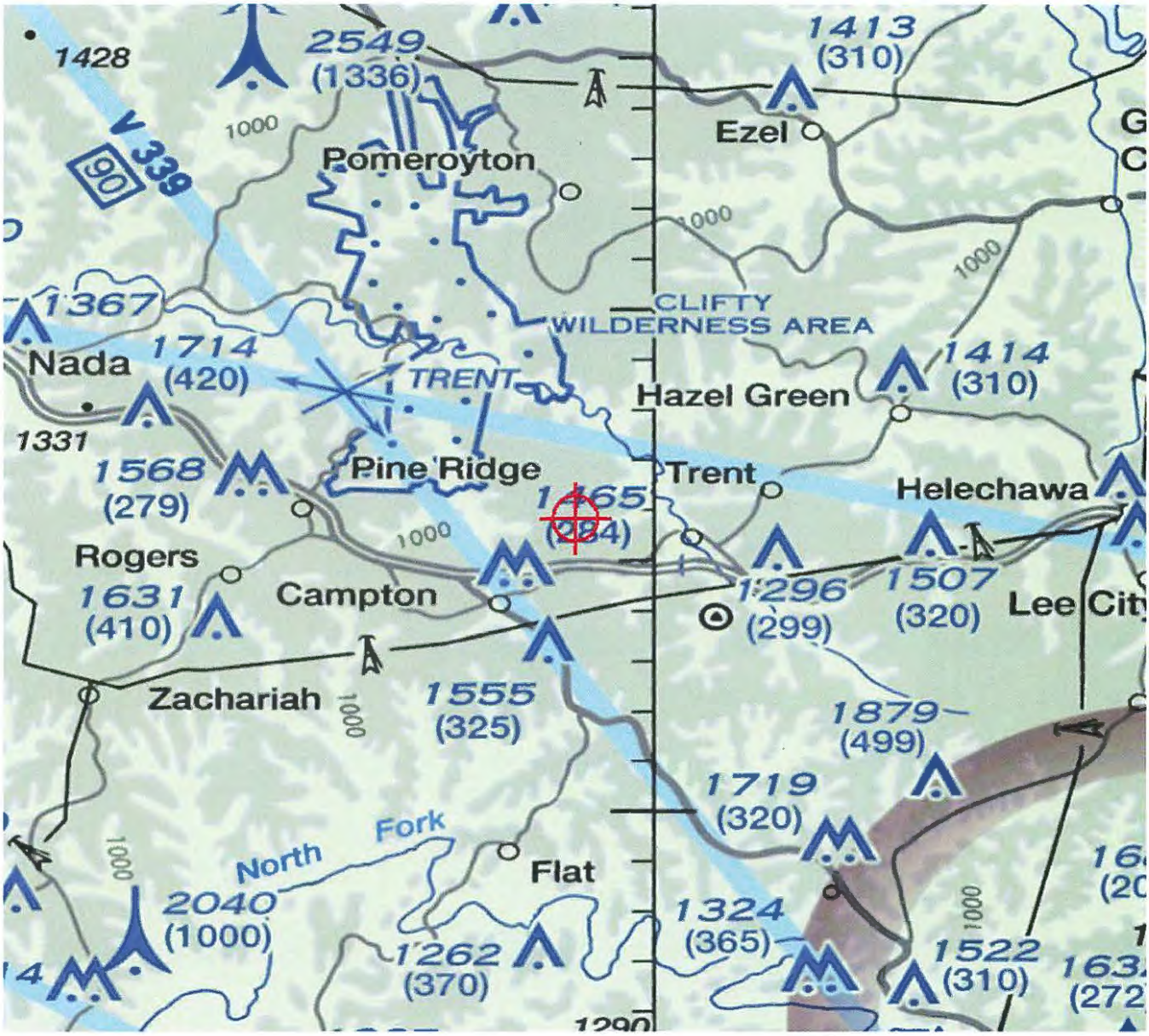
TOPO Map for ASN 2020-ASO-25415-OE




1428
2549
(1336)
1413
(310)
Ezel
V 339
90
1000
Pomeroyton
1367
CLIFTY
WILDERNESS AREA
Nada
1714
(420)
TRENT
1414
(310)
Hazel Green
1331
1568
(279)
Pine Ridge
Trent
Helechawa
1465
(284)
Rogers
1631
(410)
Campton
1296
(299)
1507
(320)
Lee City
Zachariah
1555
(325)
1879
(499)
1719
(320)
North
Fork
Flat
2040
(1000)
1262
(370)
1324
(365)
1522
(310)

KENTUCKY AIRPORT ZONING COMMISSION

ANDY BESHEAR
Governor

Office of Audits, 200 Mero Street, 4th floor
Frankfort, KY 40622
www.transportation.ky.gov
502-782-4043

JIM GRAY
Secretary

APPROVAL OF APPLICATION

October 15, 2020

APPLICANT
East Kentucky Network, LLC
Cindy McCarty
101 Technology Trail
Ivel, KY 41642

SUBJECT: AS-WOLFE-JKL-2020-116

STRUCTURE:	Antenna Tower
LOCATION:	Campton, KY
COORDINATES:	37° 45' 50.32" N / 83° 31' 34.68" W
HEIGHT:	199' AGL/1415' AMSL

The Kentucky Airport Zoning Commission has approved your application for a permit to construct 199' AGL/1415' AMSL Antenna Tower near Campton, KY 37° 45' 50.32" N / 83° 31' 34.68" W.

This permit is valid for a period of 18 Month(s) from its date of issuance. If construction is not completed within said 18-Month period, this permit shall lapse and be void, and no work shall be performed without the issuance of a new permit.

No Marking/Lighting Required.

Randall S. Royer

Randall S. Royer, Executive Director
Office of Audits
Acting Administrator
Randall.Royer@ky.gov
Jason.Salazar-Munoz@ky.gov

Kentucky UNBRIDLED SPIRIT

An Equal Opportunity Employer M/F/D

Exhibit 7

Driving Directions for Campton

1. Beginning at North Washington Street at the Wolfe County Courthouse in Campton, Kentucky travel to the traffic light at the intersection of Washington Street and KY Route 191.
2. Travel one mile and two tenths. Turn left at the intersection of KY Route 191 and KY 746.
3. Drive one mile and six tenths. Turn left onto gravel road (sign posted).
4. Drive approximately two hundred feet to the site (sign posted).

Prepared By:
Daryl Bartley
Cell Site Compliance Agent
East Kentucky Network
d/b/a Appalachian Wireless
606-791-0310 (cell)
606-339-1363 (fax)
dbartley@ekn.com

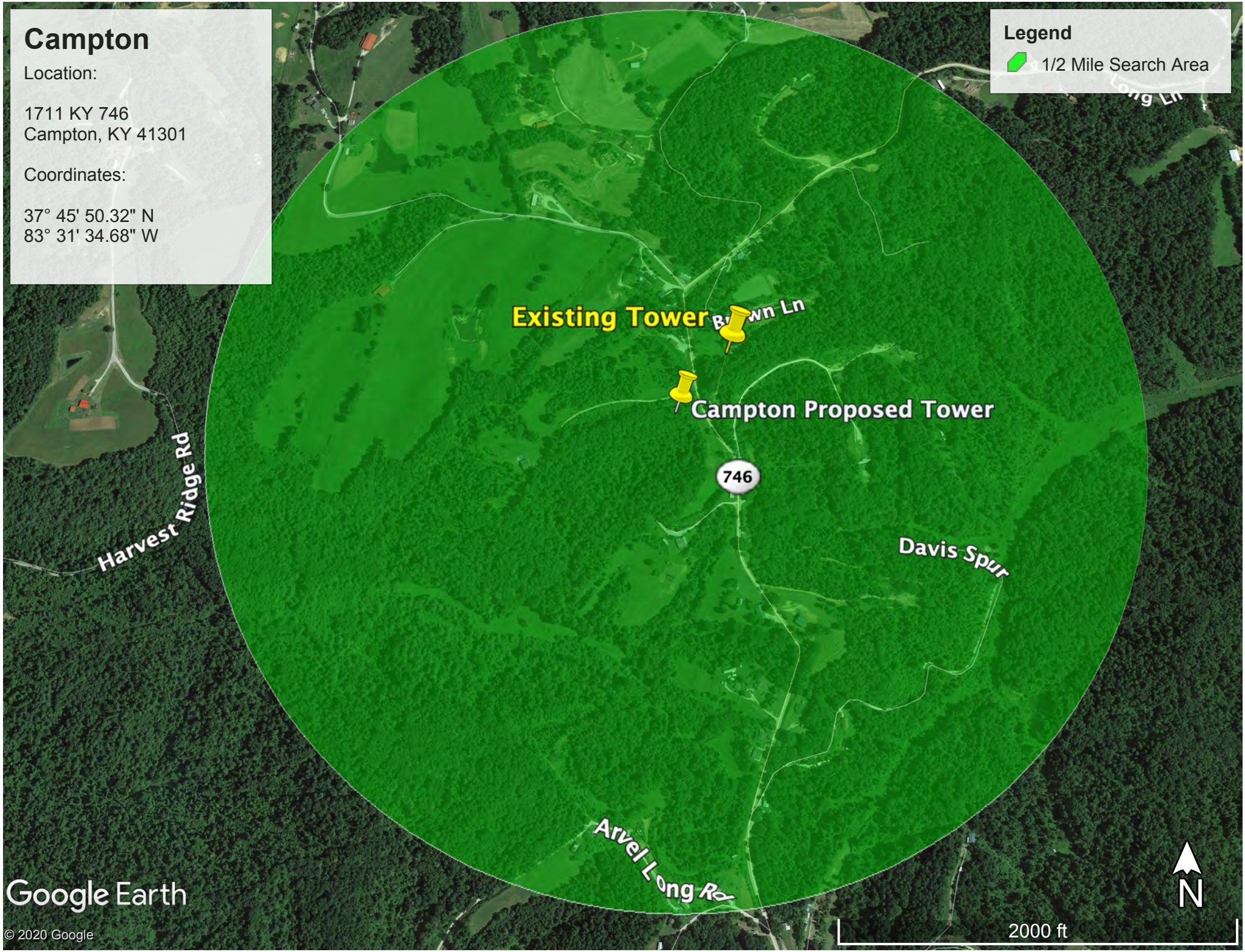

Campton
Location:
1711 KY 746
Campton, KY 41301
Coordinates:
37° 45' 50.32" N
83° 31' 34.68" W
Legend
1/2 Mile Search Area
Existing Tower
Campton Proposed Tower
746
Harvest Ridge Rd
Davis Spur
Arvel Long Rd
N
2000 ft
Google Earth
© 2020 Google

Exhibit 8

MEMORANDUM OF LEASE

THIS MEMORANDUM OF LEASE is made and entered into on this 17th day of August, 2020, with a commencement date of August 1, 2020 (the "**Commencement Date**"), by and between **JOHN MAYABB** and **GERALDINE MAYABB**, a married couple, with an address of 1625 KY 746, Campton, Kentucky 41301, hereinafter referred to as "**Lessors**", and **EAST KENTUCKY NETWORK, LLC D/B/A APPALACHIAN WIRELESS**, a Kentucky limited liability company, with a mailing address of 101 Technology Trail, Ivel, Kentucky, 41642, hereinafter referred to as "**Lessee.**"

WITNESSETH

1. **Demised Premises.** For good and valuable consideration, Lessors leased to Lessee, and Lessee has leased from Lessors that certain tract of real estate located in Wolfe County, Kentucky, and being a portion of the same land conveyed to John Mayabb and Betty Mayabb by Deed dated October 17, 1991, and recorded on October 17, 1991, in Deed Book 87, Page 684, and by Deed dated October 16, 1991, and recorded on October 17, 1991, in Deed Book 87, Page 682, both of record in the Wolfe County Clerk's Office. Said property is more particularly described in the description **attached** hereto and made a part hereof as **Exhibit A** and the plat **attached** hereto and made a part hereof as **Exhibit B**, prepared by James W. Caudill, Licensed Professional Land Surveyor (hereinafter referred to as the "**Premises**"). The Lessors have also granted unto Lessee full and complete rights of ingress, egress and regress to and from the Premises over any property owned by Lessors and other associated rights for installation of utilities, maintenance, and other purposes. Lessee has the absolute right to assign, sublease, sublicense or otherwise transfer, in whole or in part, the Leased Premises and the easements and rights-of-way.

2. **Term**. The initial term of the Lease is for a period of five (5) years from the Commencement Date set forth above.

3. **Renewals.** The Lease shall automatically renew for an additional seven (7) terms of five (5) years each, unless Lessee provides sixty (60) days written notice prior to the end of the current term that it does not wish to renew.

4. **Binding Effect**. All of the terms, conditions, and covenants hereof shall be binding and inure to the benefit of the parties and their respective heirs, representatives, successors, and assigns.

5. **Purpose**. This Memorandum of Lease is prepared solely for the purpose of recordation, and is not intended to, nor shall it be deemed to, modify any of the terms and conditions set forth in the Lease, nor to construe any of the rights, duties or responsibilities of Lessors and Lessee. In the event of any conflict between the terms and conditions of this Memorandum and the terms and conditions of the Lease, the terms and conditions of the Lease shall supersede and control.

[THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

IN WITNESS WHEREOF, Lessors and Lessee have caused their names to be signed hereto, as of the date(s) indicated below.

LESSORS:

John Mayabb
JOHN MAYABB

Geraldine Mayabb
GERALDINE MAYABB

COMMONWEALTH OF KENTUCKY
COUNTY OF Wolfe

The foregoing instrument was acknowledged before me on this 14th day of August, 2020, by John Mayabb and Geraldine Mayabb, Lessors.

Raina L. Helton
Notary Public
Commission No.: KYNP375

My Commission Expires 2-6-2024

Raina Le'Nell Helton NOTARY PUBLIC ID NO. KYNP375 MY COMMISSION EXPIRES 2-6-2024 STATE AT LARGE, KY

[THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

LESSEE:

EAST KENTUCKY NETWORK, LLC D/B/A APPALACHIAN WIRELESS

W A Gillum

By: W.A. Gillum
Its: CEO/ General Manager

COMMONWEALTH OF KENTUCKY
COUNTY OF Floyd

The foregoing instrument was acknowledged before me on this 18th day of August, 2020, by W.A. Gillum, CEO/General Manager of East Kentucky Network, LLC d/b/a Appalachian Wireless, Lessee.

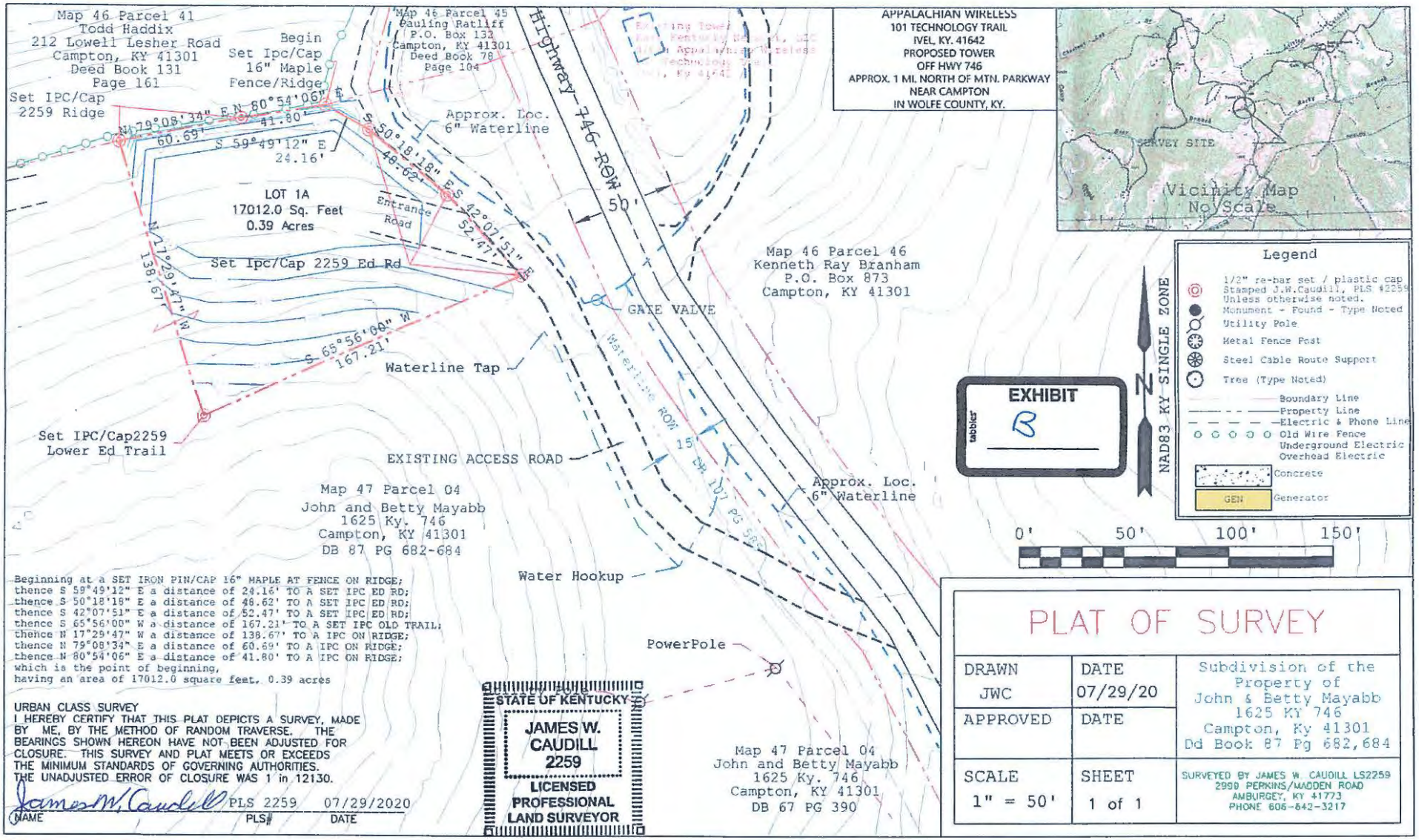
Raina D. Helton
Notary Public
Commission No.: KYNP375

My Commission Expires 2-6-2024

This instrument was prepared by:

Krystal Branham

Krystal Branham, Attorney
101 Technology Trail
Ivel, Kentucky 41642
(606) 477-2355



Beginning at a SET IRON PIN/CAP 16" MAPLE AT FENCE ON RIDGE;
thence S 59°49'12" E a distance of 24.16' TO A SET IPC ED RD;
thence S 50°18'18" E a distance of 48.62' TO A SET IPC ED RD;
thence S 42°07'51" E a distance of 52.47' TO A SET IPC ED RD;
thence S 65°56'00" W a distance of 167.21' TO A SET IPC OLD TRAIL;
thence N 17°29'47" W a distance of 138.67' TO A IPC ON RIDGE;
thence N 79°08'34" E a distance of 60.69' TO A IPC ON RIDGE;
thence N 80°54'06" E a distance of 41.80' TO A IPC ON RIDGE;
which is the point of beginning,
having an area of 17012.0 square feet, 0.39 acres

URBAN CLASS SURVEY
I HEREBY CERTIFY THAT THIS PLAT DEPICTS A SURVEY, MADE BY ME, BY THE METHOD OF RANDOM TRAVERSE. THE BEARINGS SHOWN HEREON HAVE NOT BEEN ADJUSTED FOR CLOSURE. THIS SURVEY AND PLAT MEETS OR EXCEEDS THE MINIMUM STANDARDS OF GOVERNING AUTHORITIES. THE UNADJUSTED ERROR OF CLOSURE WAS 1 in 12130.

James W. Caudill PLS 2259 07/29/2020
NAME PLS# DATE

STATE OF KENTUCKY
JAMES W. CAUDILL
2259
LICENSED PROFESSIONAL LAND SURVEYOR

PLAT OF SURVEY

DRAWN JWC	DATE 07/29/20	Subdivision of the Property of John & Betty Mayabb 1625 KY 746 Campton, Ky 41301 Dd Book 87 Pg 682,684
APPROVED	DATE	
SCALE 1" = 50'	SHEET 1 of 1	SURVEYED BY JAMES W. CAUDILL LS2259 2990 PERKINS/MADDEN ROAD AMBURGEY, KY 41773 PHONE 606-842-3217

LOT DESCRIPTION
Property of
John Mayabb and
Betty Mayabb
1625 Ky. 746
Campton, KY 41301
Off of Highway 746
Near Campton
in Wolfe County, Kentucky
July 29, 2020

A certain tract or parcel of land lying in Wolfe County, Kentucky, and being a portion of the same tract of land conveyed to John Mayabb and Betty Mayabb, husband and wife, by General Warranty Deed, dated October 16, 1991, from Ruby Campbell, and of record in Deed Book 87 Page 682-684 of the records of the Wolfe County Court Clerk's Office. The tract is more particularly bounded and described as follows:

Lot 1A

Beginning at set iron pin marked LS#2259 at a 16" maple at a fence on the ridge; thence along the edge of the old road (now gone) South 59 deg 49 min 12 sec East, a distance of 24.16 feet to a set iron pin with cap marked LS#2259; thence continuing with old road South 50 deg 18 min 18 sec East, a distance of 48.62 feet to a set iron pin with cap marked LS#2259; thence still continuing with the old road South 42 deg 07 min 51 sec East, a distance of 52.47 feet to a set iron pin marked LS#2259; thence leaving the old road and down a trail no longer in use South 65 deg 56 min 00 sec West, a distance of 167.21 feet to a set iron pin marked LS#2259 at the edge of the old trail; thence up the hill North 17 deg 29 min 47 sec West, a distance of 138.67 feet to a set iron pin marked LS#2259 on the ridge; thence with the ridge North 79 deg 08 min 34 sec East, a distance 60.69 feet to a set iron pin with cap marked LS#2259 on ridge at fence; thence with fence and ridge North 80 deg 54 min 06 sec East, a distance of 41.80 feet to a set iron pin with cap marked LS#2259 to the point of the beginning. Containing a calculated area of 17,012.0 Sq. Feet, or 0.39 Acres.

Also to be included is an access road from the public highway # 746 to Lot 1A. This access road a being a portion of John Mayabb and Betty Mayabb property in deed book 87 pages 682-684 and deed book 67 page 390. Also to be included is a right to install fiber and utility lines in or along said access road and/or such other location to be agreed upon by the parties.

Unless stated otherwise, any monument referred to herein as "set iron pin with cap" is a set ½" diameter rebar, at least eighteen (18") in length, with a plastic cap stamped "LS-2259". All bearings stated herein are referred to NAD83, KY single zone of the Kentucky state plane system.

This survey was performed on July 28, 2020 by James W. Caudill, a Kentucky Licensed Professional Land Surveyor No. 2259

James W. Caudill

James W. Caudill, PLS #2259

STATE OF KENTUCKY
COUNTY OF WOLFE
I, STEVE OLIVER , County Clerk for the County and State aforesaid, certify that the foregoing LEASE was on August 24, 2020 0:00 AM lodged for record, whereupon the same with the foregoing and this certificate have been duly recorded in my office.
WITNESS my hand this August 24, 2020
STEVE OLIVER, CLERK

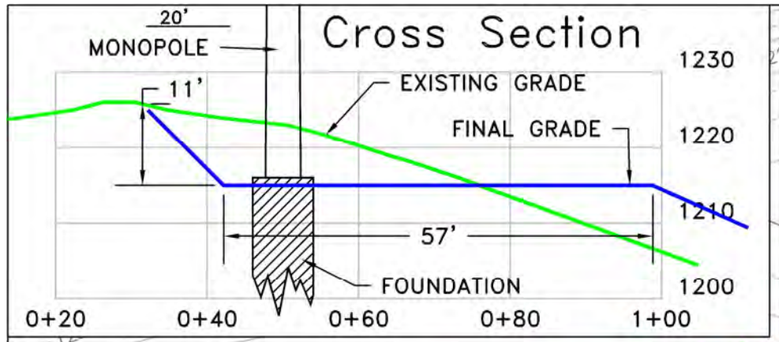
BY: D.C.

STATE OF KENTUCKY
JAMES W. CAUDILL 2259
LICENSED PROFESSIONAL LAND SURVEYOR

Book: 41 Pages: 396-401 (6)
Name: LEASE
STEVE OLIVER
WOLFE COUNTY
8/24/2020 0:00 AM
D.C: corinna
Deed Tax: $0.00
300576

EXHIBIT
tabbies
A

Exhibit 9



APPALACHIAN WIRELESS
101 TECHNOLOGY TRAIL
IVEL, KY. 41642
PROPOSED NEW TOWER
OFF HWY 746 NEAR CAMPTON
IN WOLFE COUNTY, KY.

Map 46 Parcel 41
Todd Haddix
212 Lowell Lesher Road
Campton, KY 41301
Deed Book 131
Page 161

Existing Tower
East Kentucky Network, LLC
d/b/a Appalachian Wireless
101 Technology Trail
Ivel, Ky 41642

APPROXIMATE PROPERTY LINE LOCATION

Cross Section

Profile

EQUIPMENT SHELTER
16'
11.25'
16.18'
8.45'
8'

LINE	BEARING	DISTANCE
L1	S 05°49'24" E	21.07'
L2	S 54°50'13" W	47.87'
L3	N 81°05'46" W	98.65'

LOT 1A
17158.0 Sq. Feet
0.39 Acres

Proposed New Monopole Tower
LAT:37°45'50.32490"
LON:83°31'34.68187"
N:3,809,410.16
E:5,563,966.94
EL:1216'

Waterline ROW
15'
Highway 746 ROW
50'
DB 107 PG585

Existing Access Road
Waterline Tap
Gate Valve

0' 20' 40' 60'

NAD83 KY SINGLE ZONE
N

Map 47 Parcel 04
John and Betty Mayabb
1625 Ky. 746
Campton, KY 41301
DB 87 PG 682-684

"I certify that the latitude 37°45'50.32490"N and longitude 83°31'34.68187"W are within +/- 50 feet horizontally; and the site elevation 1216 ft. MSL, is within +/- 20 feet vertically. With a structure height of 190 ft AGL, the overall height is 1406 ft, AMSL. The horizontal datum (coordinates) is in terms of the North Americation Datum Of 1983 (NAD 83). The vertical datum heights are in terms of the North American Vertical Datum of 1988, and are determined to the nearest foot."

SIGNED: James W. Caudill PE 12305 LS 2259 01/07/21
PRINTED: JAMES W. CAUDILL PE #12305 & LS #2259 DATE

-THE PROPOSED TOWER HAS BEEN LOCATED USING DUAL FREQUENCY GPS UNIT PROCESSED BY "OPUS"
-STATE PLANE COORDINATES NAD 83 KY SINGLE ZONE N:3809410.16, E:5563966.94, EL 1215' FINAL GRADE TOP OF FOUNDATION EL 1216'-TOP TOWER EL 1406'
-PRECISION: HORIZONTAL=50' VERTICAL=20'
-THIS SURVEY MEETS OBSTACLE ACCURACY CODE 2C.
-PROPERTY LINE INFORMATION TAKEN FROM DEEDS

STATE OF KENTUCKY
James W. Caudill
12305
LICENSED PROFESSIONAL ENGINEER

STATE OF KENTUCKY
JAMES W. CAUDILL
2259
LICENSED PROFESSIONAL LAND SURVEYOR

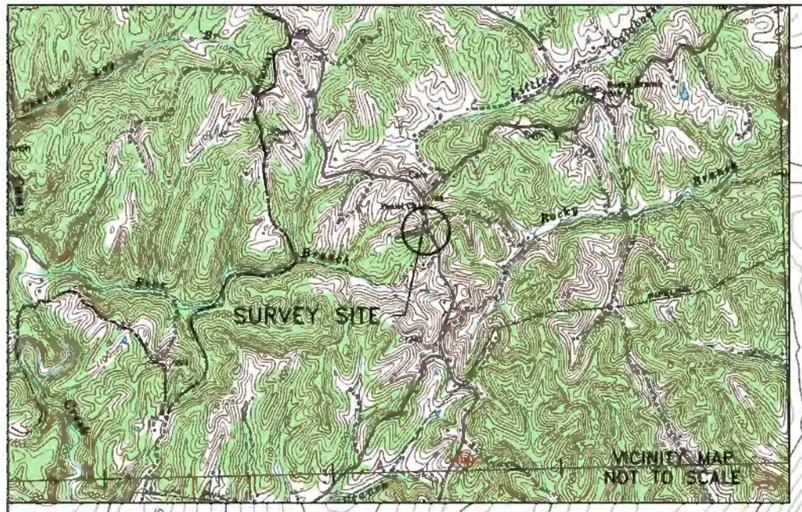
SURVEY STA SET FOUND
IRON PIN WITH CAP (18" X .5" REBAR PLASTIC CAP MARKED LS2259)
BOUNDARY LINE
ROAD
WATER LINE

East Kentucky Network
d/b/a Appalachian Wireless
101 Technology Trail, Ivel, KY 41642

DRAWN JWC	DATE 01/07/21	Campton Tower Site Tower Replacement Proposed Layout Located off of Hwy 746 Wolfe County, Kentucky
APPROVED JWC	DATE 01/07/21	
SCALE 1" = 20'	SHEET 2 of 3	PROJECT NO. Campton/mayabb 2c 20

Exhibit 10

APPALACHIAN WIRELESS
101 TECHNOLOGY TRAIL
IVEL, KY. 41642
PROPOSED NEW TOWER
CAMPTON IN WOLFE COUNTY



MAP 046 PARCEL 037
LARRY GILLESPIE
7.71 AC

Map 46 Parcel 39
Todd Haddix and
Chastity Haddix
50 Rose Street
Campton, KY 41301
Deed Book 121
Page 29

Map 46 Parcel 45
Pauline Ratliff
P.O. Box 132
212 Lowell Lesher Road
Campton, KY 41301
Deed Book 78
Page 104

Proposed Monopole Tower
LAT:37°45'50.32490"
LON:83°31'34.68187"

Tower

Mountain Telephone Coop Corp.
405 S. Main St.
P.O. Box 399
West Liberty, KY 41472

500'

Map 46 Parcel 41
Todd Haddix
212 Lowell Lesher Road
Campton, KY 41301
Deed Book 131
Page 161

Proposed Tower Location

Access Road

Highway 746

Map 46 Parcel 46
Kenneth Ray Branham
P.O. Box 873
Campton, KY 41301

Affected
Area Boundary

Map 47 Parcel 04
John and Betty Mayabb
1625 Ky. 746
Campton, KY 41301
DB 87 PG 682-684

Map 47 Parcel 04
John and Betty Mayabb
1625 Ky. 746
Campton, KY 41301
DB 90 PG 669

Map 47 Parcel 04
John and Betty Mayabb
1625 Ky. 746
Campton, KY 41301
DB 67 PG 390

Bear Br.

Map 47 Parcel 03
B. Scott Graham
P.O. Box 637
Stanton, KY 40380
DB 122 PG 455

NAD83 KY SINGLE ZONE

N

0 200' 400' 600'

LEGEND
PROPERTY LINE
ACCESS ROAD
LOT BOUNDARY

J W CAUDILL ENGINEERING
9283 HWY 15 STE. C ISOM, KY 41824

ENGINEER'S CERTIFICATE: I HEREBY CERTIFY THAT INFORMATION SHOWN REFLECTS THE INFORMATION OBTAINED AND PROVIDED BY THE WOLFE COUNTY PROPERTY VALUATION ADMINISTRATION OFFICE IN CAMPTON, KY.

James W. Caudill 12305 01/07/21
JAMES W. CAUDILL P.E.# DATE

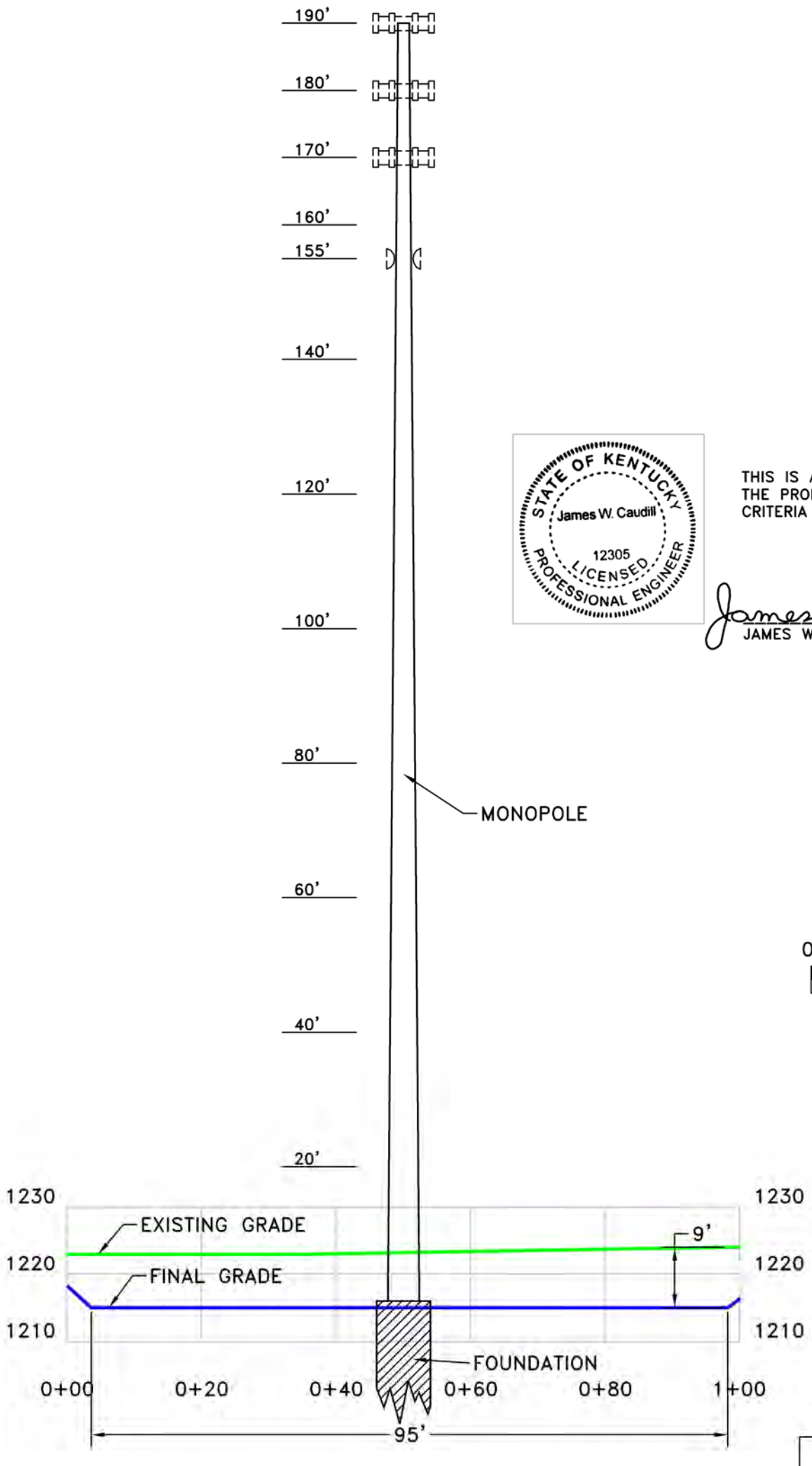
STATE OF KENTUCKY
James W. Caudill
12305
LICENSED
PROFESSIONAL ENGINEER

East Kentucky Network
d/b/a Appalachian Wireless
101 Technology Trail, Ivel, KY 41642

DRAWN JWC	DATE 01/07/21	Proposed Site Plan and Structure Location Campton Tower Site Off Highway 746 in Wolfe Co., KY.
APPROVED JWC	DATE 01/07/21	
SCALE 1" = 200'	SHEET 1 of 3	PROJECT NO. Campton/Campton200PVA

Exhibit 11

APPALACHIAN WIRELESS
101 TECHNOLOGY TRAIL
IVEL, KY. 41642
PROPOSED TOWER
OFF HWY 746 NEAR CAMPTON
IN WOLFE COUNTY, KY.



PROFILE WITH TOWER

STATE OF KENTUCKY
James W. Caudill
12305
LICENSED
PROFESSIONAL ENGINEER

THIS IS A VERTICAL PROFILE SKETCH OF THE TOWER INDICATING THE PROPOSED ANTENNA AND DISH ELEVATIONS. NO DESIGN CRITERIA WAS CONSIDERED IN THE PREPARATION OF THIS DRAWING.

James W. Caudill 12305 01/07/21
JAMES W. CAUDILL PE #. DATE

NOTE: SEE FOUNDATION DRAWINGS FOR DETAILS

01/07/21
SCALE 1" = 20'

0' 20' 40' 60'

East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 01/07/21	Campton Tower Site Tower Replacement Proposed Layout Located off of Hwy 746 Wolfe County, Kentucky
APPROVED JWC	DATE 01/07/21	
SCALE 1" = 20'	SHEET 3 of 3	PROJECT NO. Campton/mayabb 2c 20

Exhibit 12

Utility ID	Utility Name	Utility Type	Class	City	State
4107900	365 Wireless, LLC	Cellular	D	Atlanta	GA
4109300	Access Point, Inc.	Cellular	D	Cary	NC
4108300	Air Voice Wireless, LLC	Cellular	A	Bloomfield Hill	MI
4110650	Alliant Technologies of KY, L.L.C.	Cellular	C	Morristown	NJ
44451184	Alltel Communications, LLC	Cellular	A	Basking Ridge	NJ
4110850	AltaWorx, LLC	Cellular	C	Fairhope	AL
4107800	American Broadband and Telecommunications Company	Cellular	C	Toledo	OH
4108650	AmeriMex Communications Corp.	Cellular	D	Dunedin	FL
4105100	AmeriVision Communications, Inc. d/b/a Affinity 4	Cellular	D	Virginia Beach	VA
4110700	Andrew David Balholm dba Norcell	Cellular	C	Clayton	WA
4108600	BCN Telecom, Inc.	Cellular	D	Morristown	NJ
4110550	Blue Casa Mobile, LLC	Cellular	D	Santa Barbara	CA
4108750	Blue Jay Wireless, LLC	Cellular	C	Carrollton	TX
4111050	BlueBird Communications, LLC	Cellular	C	New York	NY
4202300	Bluegrass Wireless, LLC	Cellular	A	Elizabethtown	KY
4107600	Boomerang Wireless, LLC	Cellular	B	Hiawatha	IA
4105500	BullsEye Telecom, Inc.	Cellular	D	Southfield	MI
4110050	CampusSims, Inc.	Cellular	D	Boston	MA
4100700	Cellco Partnership dba Verizon Wireless	Cellular	A	Basking Ridge	NJ
4106600	Cintex Wireless, LLC	Cellular	D	Rockville	MD
4111000	ComApp Technologies LLC	Cellular	C	Melrose	MA
4101900	Consumer Cellular, Incorporated	Cellular	A	Portland	OR
4106400	Credo Mobile, Inc.	Cellular	A	San Francisco	CA
4108850	Cricket Wireless, LLC	Cellular	A	San Antonio	TX
4001900	CTC Communications Corp. d/b/a EarthLink Business I	Cellular	D	Grand Rapids	MI
10640	Cumberland Cellular Partnership	Cellular	A	Elizabethtown	KY
4101000	East Kentucky Network, LLC dba Appalachian Wireless	Cellular	A	Ivel	KY
4002300	Easy Telephone Service Company dba Easy Wireless	Cellular	D	Ocala	FL
4109500	Enhanced Communications Group, LLC	Cellular	D	Bartlesville	OK
4110450	Excelius Communications, LLC	Cellular	D	Chattanooga	TN
4105900	Flash Wireless, LLC	Cellular	C	Concord	NC
4104800	France Telecom Corporate Solutions L.L.C.	Cellular	D	Oak Hill	VA
4109350	Global Connection Inc. of America	Cellular	D	Norcross	GA
4102200	Globalstar USA, LLC	Cellular	B	Covington	LA
4109600	Google North America Inc.	Cellular	A	Mountain View	CA
33350363	Granite Telecommunications, LLC	Cellular	D	Quincy	MA
4106000	GreatCall, Inc. d/b/a Jitterbug	Cellular	A	San Diego	CA
10630	GTE Wireless of the Midwest dba Verizon Wireless	Cellular	A	Basking Ridge	NJ
4110600	Horizon River Technologies, LLC	Cellular	C	Atlanta	GA
4103100	i-Wireless, LLC	Cellular	A	Newport	KY
4109800	IM Telecom, LLC d/b/a Infiniti Mobile	Cellular	D	Tulsa	OK
22215360	KDDI America, Inc.	Cellular	D	New York	NY
10872	Kentucky RSA #1 Partnership	Cellular	A	Basking Ridge	NJ
10680	Kentucky RSA #3 Cellular General	Cellular	A	Elizabethtown	KY
10681	Kentucky RSA #4 Cellular General	Cellular	A	Elizabethtown	KY
4109750	Konatel, Inc. dba telecom.mobi	Cellular	D	Johnstown	PA
4110900	Lunar Labs, Inc.	Cellular	C	Detroit	MI
4107300	Lycamobile USA, Inc.	Cellular	D	Newark	NJ
4108800	MetroPCS Michigan, LLC	Cellular	A	Bellevue	WA
4109650	Mitel Cloud Services, Inc.	Cellular	D	Mesa	AZ
4202400	New Cingular Wireless PCS, LLC dba AT&T Mobility, PCS	Cellular	A	San Antonio	TX
10900	New Par dba Verizon Wireless	Cellular	A	Basking Ridge	NJ
4000800	Nextel West Corporation	Cellular	D	Overland Park	KS
4001300	NPCR, Inc. dba Nextel Partners	Cellular	D	Overland Park	KS

4001800	OnStar, LLC	Cellular	A	Detroit	MI
4110750	Onvoy Spectrum, LLC	Cellular	C	Plymouth	MN
4109050	Patriot Mobile LLC	Cellular	D	Southlake	TX
4110250	Plintron Technologies USA LLC	Cellular	D	Bellevue	WA
33351182	PNG Telecommunications, Inc. dba PowerNet Global Communications	Cellular	D	Cincinnati	OH
4202100	Powertel/Memphis, Inc. dba T-Mobile	Cellular	A	Bellevue	WA
4107700	Puretalk Holdings, LLC	Cellular	A	Covington	GA
4106700	Q Link Wireless, LLC	Cellular	A	Dania	FL
4108700	Ready Wireless, LLC	Cellular	B	Hiawatha	IA
4110500	Republic Wireless, Inc.	Cellular	D	Raleigh	NC
4111100	ROK Mobile, Inc.	Cellular	C	Culver City	CA
4106200	Rural Cellular Corporation	Cellular	A	Basking Ridge	NJ
4108550	Sage Telecom Communications, LLC dba TruConnect	Cellular	D	Los Angeles	CA
4109150	SelecTel, Inc. d/b/a SelecTel Wireless	Cellular	D	Freemont	NE
4106300	SI Wireless, LLC	Cellular	A	Carbondale	IL
4110150	Spectrotel, Inc. d/b/a Touch Base Communications	Cellular	D	Neptune	NJ
4200100	Sprint Spectrum, L.P.	Cellular	A	Atlanta	GA
4200500	SprintCom, Inc.	Cellular	A	Atlanta	GA
4109550	Stream Communications, LLC	Cellular	D	Dallas	TX
4110200	T C Telephone LLC d/b/a Horizon Cellular	Cellular	D	Red Bluff	CA
4202200	T-Mobile Central, LLC dba T-Mobile	Cellular	A	Bellevue	WA
4002500	TAG Mobile, LLC	Cellular	D	Carrollton	TX
4109700	Telecom Management, Inc. dba Pioneer Telephone	Cellular	D	South Portland	ME
4107200	Telefonica USA, Inc.	Cellular	D	Miami	FL
4108900	Telrite Corporation dba Life Wireless	Cellular	D	Covington	GA
4108450	Tempo Telecom, LLC	Cellular	D	Kansas City	MO
4109950	The People's Operator USA, LLC	Cellular	D	New York	NY
4109000	Ting, Inc.	Cellular	A	Toronto	ON
4110400	Torch Wireless Corp.	Cellular	D	Jacksonville	FL
4103300	Touchtone Communications, Inc.	Cellular	D	Whippany	NJ
4104200	TracFone Wireless, Inc.	Cellular	D	Miami	FL
4002000	Truphone, Inc.	Cellular	D	Durham	NC
4110300	UVNV, Inc.	Cellular	D	Costa Mesa	CA
4105700	Virgin Mobile USA, L.P.	Cellular	A	Atlanta	GA
4110800	Visible Service LLC	Cellular	C	Lone Tree	CO
4106500	WiMacTel, Inc.	Cellular	D	Palo Alto	CA
4110950	Wing Tel Inc.	Cellular	C	New York	NY
4109900	Wireless Telecom Cooperative, Inc. dba theWirelessFreeway	Cellular	D	Louisville	KY

Exhibit 13

S & S Tower Services
120 Branden Dr.
Mousie, KY 41839

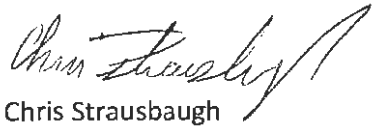
Kentucky Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, KY 40602-0615

Dear Commissioners:

The Construction Manager for the proposed communications facility will be Dave Strausbaugh. His contact information is (606) 497-6730 or dstrausbaugh010@gmail.com.

Dave has been in the industry completing civil construction and constructing towers since 1991. He has worked for S&S Tower Services since 2015 as Construction Manager overseeing the construction of telecommunications towers and sites.

Thank you,



Chris Strausbaugh
Owner
S&S Tower Services
(606) 497-5798