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PUBLIC SERVICE  
COMMISSION

**COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of:

THE APPLICATION OF EAST KENTUCKY NETWORK )  
LIMITED LIABILITY COMPANY FOR THE ISSUANCE )  
OF A CERTIFICATE OF PUBLIC CONVENIENCE AND ) CASE No 2015-00391  
NECESSITY TO CONSTRUCT A TOWER IN HARLAN )  
COUNTY, KENTUCKY).

East Kentucky Network, LLC, d/b/a Appalachian Wireless, was granted authorization to provide Personal Communications Service (“PCS”) in the Middlesboro-Harlan, KY Basic Trading Area (BTA295) by the Federal Communications Commission (FCC). FCC license is included as Exhibit 1. East Kentucky Network, LLC merger documents were filed with the Commission on February 2, 2001 in Case # 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 state of Kentucky.

In an effort to improve service in Harlan County, East Kentucky Network, LLC pursuant to KRS 278.020 Subsection 1 and 807 KAR 5:001 Section 9 is seeking the Commission’s approval to construct a 300 foot self-supporting tower on a tract of land located on Highway 421, Lenarue, Harlan County, Kentucky (36°48’32.7775”N 83°16’06.6443”W). A map and detailed directions to the site can be found in Exhibit 7.

Exhibit 2 is a list of all Property owners or residents according to the property valuation administrator’s record who reside or own property within 500 feet of the proposed tower in accordance with the Public Valuation Administrator. No other properties are contiguous with East Kentucky Network’s property.

Pursuant to 807 KAR 5:063 Section 1 (1)(L) and Section 1(1)(n)(1) all affected property owners according to the property valuation administrator’s record who reside or own property

within 500 feet of the proposed Tower 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.

Harlan County has no formal local planning unit. In absence of this unit the Harlan County Judge Executive's office was notified by certified mail, return receipt requested of East Kentucky Network Limited Liability Company's proposal and informed of their right to intervene. They were 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 Harlan Daily Enterprise, January 13, 2016, edition. Enclosed is a copy of that notice in Exhibit 3. The Harlan Daily Enterprise is the newspaper with the largest circulation in Harlan County.

Environmental Resources Management Consulting Company 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 World Tower Company 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.

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.

East Kentucky Network, LLC will finance the subject Construction with earned surplus in its General Fund.

Estimated Cost of Construction	\$ 350,000.00
Annual Operation Expense of Tower	\$ 12,500.00

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 December 23, 2015, 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 on a piece 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. No other tower capable of supporting East Kentucky Network, LLC's load exists in the general area; therefore, there is no opportunity for co-location of our facilities with anyone else.

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

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

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

The foregoing document was prepared by staff at East Kentucky Network, LLC d/b/a Appalachian Wireless, and reviewed by William S. Kendrick, Attorney at Law. 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: 1/11/2016  
Lynn Haney, Regulatory Compliance Director

APPROVED BY: W.A. Gillum DATE: 1/13/2016  
W.A. Gillum, General Manager

ATTORNEY: William Kendrick DATE: 1/13/2016  
Hon. William S. Kendrick, 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**

**William S. Kendrick, Attorney**  
**Phone: (606) 263-4943**  
**Email: wkendrick@pennstuart.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 Notices to Land Owners
3	Notification of County Judge Executive and Newspaper Advertisement
4	Universal Soil Bearing Analysis
5	Tower Design
6	FAA and KAZC Approvals
7	Driving Directions from County Court House and Map to Suitable Scale
8	Memorandum 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	

ULS License

**PCS Broadband License - WQEF975 - East Kentucky Network, LLC d/b/a Appalachian Wireless**

Call Sign	WQEF975	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular
<b>Market</b>			
Market	MTA044 - Knoxville	Channel Block	A
Submarket	12	Associated Frequencies (MHz)	001850.00000000-001865.00000000 001930.00000000-001945.00000000

**Dates**

Grant	05/27/2015	Expiration	06/23/2025
Effective	05/27/2015	Cancellation	

**Buildout Deadlines**

1st	2nd
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**Notification Dates**

1st	2nd
-----	-----

**Licensee**

FRN	0001786607	Type	Limited Liability Company
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**Licensee**

East Kentucky Network, LLC d/b/a Appalachian Wireless 101 Technology Trail Ivel, KY 41642 ATTN W.A. Gillum, General Manager/CEO	P:(606)477-2355
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**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@fcdlaw.com
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**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.

**Tribal Land Bidding Credits**

This license did not have tribal land bidding credits.

**Demographics**

Race

Ethnicity

Gender

**EXHIBIT II: 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.

LIST OF PROPERTY OWNERS

George Henry Brock Heirs  
C/O Rick Brock  
P.O. Box 1022  
Harlan, KY 40831

COAP  
P.O. Box 1617  
Harlan, KY 40831

Larry G. And Debra Ann Hubbs  
P.O. Box 1133  
Harlan, KY 40831

Richard and Cynthia Brock  
P.O. Box 1022  
Harlan, KY 40831

David Lane and Elisa Brock  
P.O. Box 1363  
Harlan, KY 40831



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 7, 2016

COAP  
P.O. Box 1617  
Harlan, KY 40831

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2015-00391)

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 Harlan County. The facility will include a 300-foot self-supporting tower with attached antennas extending upwards, and an equipment shelter located on a tract of land on Highway 421, Lenarue, Harlan County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property or reside within a 500' radius of the proposed tower.

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. 2015-00391 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  
Regulatory Compliance Director  
Enclosure 1



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 7, 2016

Larry G. and Debra Hubbs  
P.O. Box 1133  
Harlan, KY 40831

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2015-00391)

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Sincerely,

Lynn Haney  
Regulatory Compliance Director  
Enclosure 1



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 7, 2016

Richard and Cynthia Brock  
P.O. Box 1022  
Harlan, KY 40831

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Sincerely,

Lynn Haney  
Regulatory Compliance Director  
Enclosure 1



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

January 7, 2016

David Lane and Elisa Brock  
P.O. Box 1363  
Harlan, KY 40831

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Lynn Haney  
Regulatory Compliance Director  
Enclosure 1



VIA: U.S. CERTIFIED MAIL

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January 7, 2016

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C/O Rick Brock  
P.O. Box 1022  
Harlan, KY 40831

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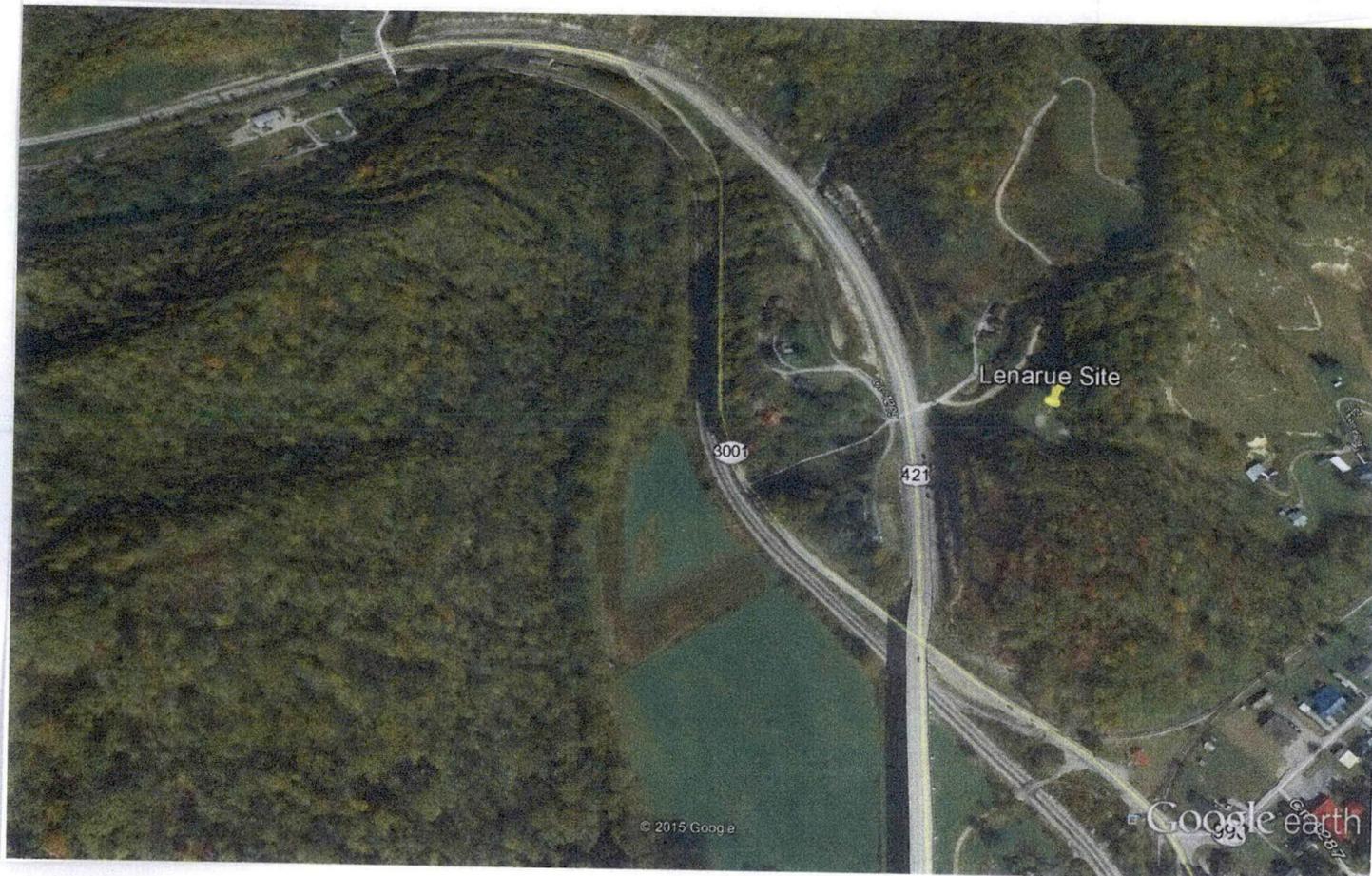
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Sincerely,

Lynn Haney  
Regulatory Compliance Director  
Enclosure 1

# Appalachian Wireless Location Map



Site Name

Lenarue

Location

JCT. of HWY. 421 and Wampus Creek Rd.

GPS Location

N 36 48 32.77

W 83 16 06.64





VIA: U.S. CERTIFIED MAIL

January 7, 2016

Dan Mosley, Judge Executive  
P.O. Box 956  
Harlan, KY 40831

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2015-00391)

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 Harlan County. The facility will include a 300-foot self-supporting tower with attached antennas extending upwards, and an equipment shelter located on a tract of land on Highway 421, Lenarue, Harlan 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 Harlan 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.

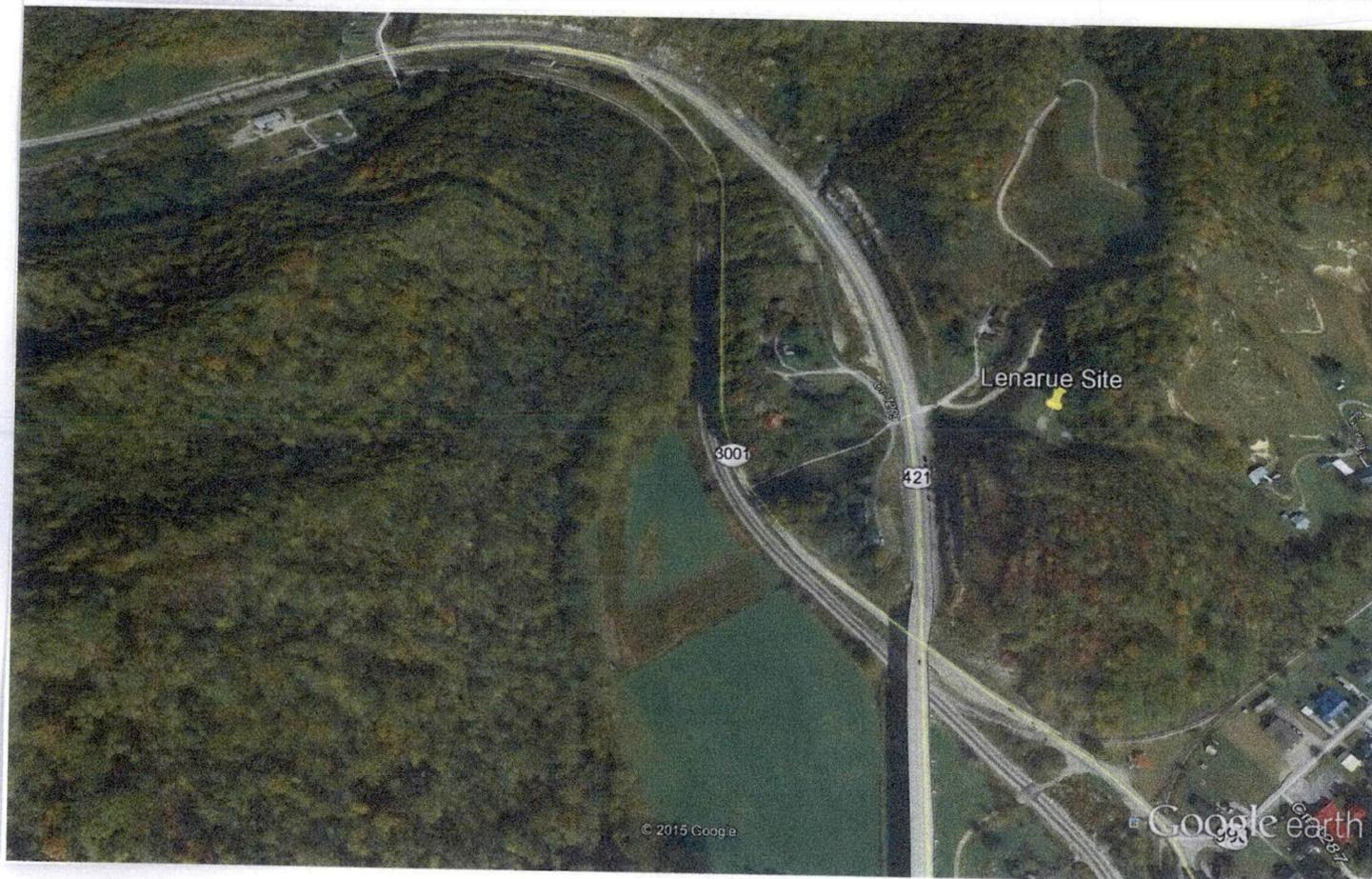
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If you have any questions for East Kentucky Network, LLC, please direct them to my attention at the following address: East Kentucky Network, LLC, 101 Technology Trail, Ivel, KY 41642 or call me at 606-477-2355, Ext. 1007.

Sincerely,

Lynn Haney  
Regulatory Compliance Director  
Enclosure

# Appalachian Wireless Location Map



Site Name

Lenarue

Location

JCT. of HWY. 421 and Wampus Creek Rd.

GPS Location

N 36 48 32.77

W 83 16 06.64

**APPALACHIAN WIRELESS**  
**Geotechnical Investigation on the**  
**Lenarue Site**  
**Harlan County, Kentucky**  
**ERMC<sup>2</sup> Project No. 165-000-0010**

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

PREPARED BY:  
Richard Dirk Smith PE, PLS  
General Manager Appalachian Region  
**ENVIRONMENTAL RESOURCES MANAGEMENT**  
**CONSULTING COMPANY**  
230 Swartz Drive  
Hazard, Kentucky 41701

  
\_\_\_\_\_, 20215, December 15<sup>th</sup>, 20115



**EXECUTIVE SUMMARY**

- 1.0 INTRODUCTION**
- 2.0 PROJECT DESCRIPTION**
- 3.0 SITE DESCRIPTION**
- 4.0 FIELD EXPLORATION**
  - 4.1 SITE INFORMATION
  - 4.2 BRING DATA
  - 4.3 GROUNDWATER
  - 4.4 SEISMIC SITE CLASSIFICATION
- 5.0 DISCUSSION AND RECOMMENDATIONS**
  - 5.1 GENERAL
  - 5.2 FOUNDATIONS
  - 5.3 SHALLOW FOUNDATIONS
  - 5.4 DEEP FOUNDATIONS
  - 5.5 BURIED UTILITIES
- 6.0 DISCUSSION AND RECOMMENDATIONS**
  - 6.1 SURFACE INVESTIGATION
  - 6.2 LABORATORY AND FIELD TESTING
  - 6.3 ANALYSIS AND RECOMMENDATIONS
  - 6.4 CONSTRUCTION MONITORING
  - 6.5 GENERAL

**SPECIFICATIONS**

- I - GENERAL**
- II - DRILLED PEIR INSTALATIONS**
- III - ENGINEERED FILL BENEATH STRUCTURES**
- IV - GUIDELINES FOR EXCAVATIONS AND TRENCHING**
- V - GENERAL CONCRETE SPECIFICATIONS**

**APPENDIX A - BORING DATA AND TESTING**

**APPENDIX B - SITE MAPS BOUNDARY MAPS & EARTHWORK**



## EXECUTIVE SUMMARY

A geotechnical investigation has been performed on the Lenarue tower site. Located on Wampus Creek, Harlan County Kentucky. This site is readably accessible. A location map is shown in Figure 1 of this report. Four (4) borings were advanced to depths ranging from 23.3 ft. to 36.4 ft. The following geotechnical considerations were identified:

- Borings utilized for this study encountered fill material to a depth of 26 ft. Topography indicates that the fill is approximately 40 feet deep.
- This area is a reclaimed road fill site. This area has been reclaimed as a grassland area with trees/shrub vegetation spread intermittently. There is an abandoned sand court and building pad on the fill, indicating previous recreational use. The fill site appears to have been constructed in conjunction with road construction of Highway 421.
- The bearing capacities of the spoil is estimated at 1000 psf and the underlying rock is 6 tsf.
- The 2009 International Building Code seismic site classification for this site is "E".
- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We therefore recommend that ErMC<sup>2</sup> be 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, recommendation and all other concerns.



## 1. INTRODUCTION

Environmental Resources Management Consultant Company (ERMC<sup>2</sup>) was retained by Mr. Marty Thacker of Appalachian Wireless to prepare a geotechnical engineering report for the proposed tower site located on the Lenarue property, on Wampus Creek, Harlan County, Kentucky. A site location map is shown in Figure No. 1.

Four (4) borings were advanced to depths ranging from 25.5 ft. to 36.4 ft. Logs of the borings along with a boring location plan are included in Appendix A. The purpose of these services is to provide information and geotechnical engineering recommendations relative to subsurface conditions, earthwork, seismic considerations, groundwater conditions and foundation design.

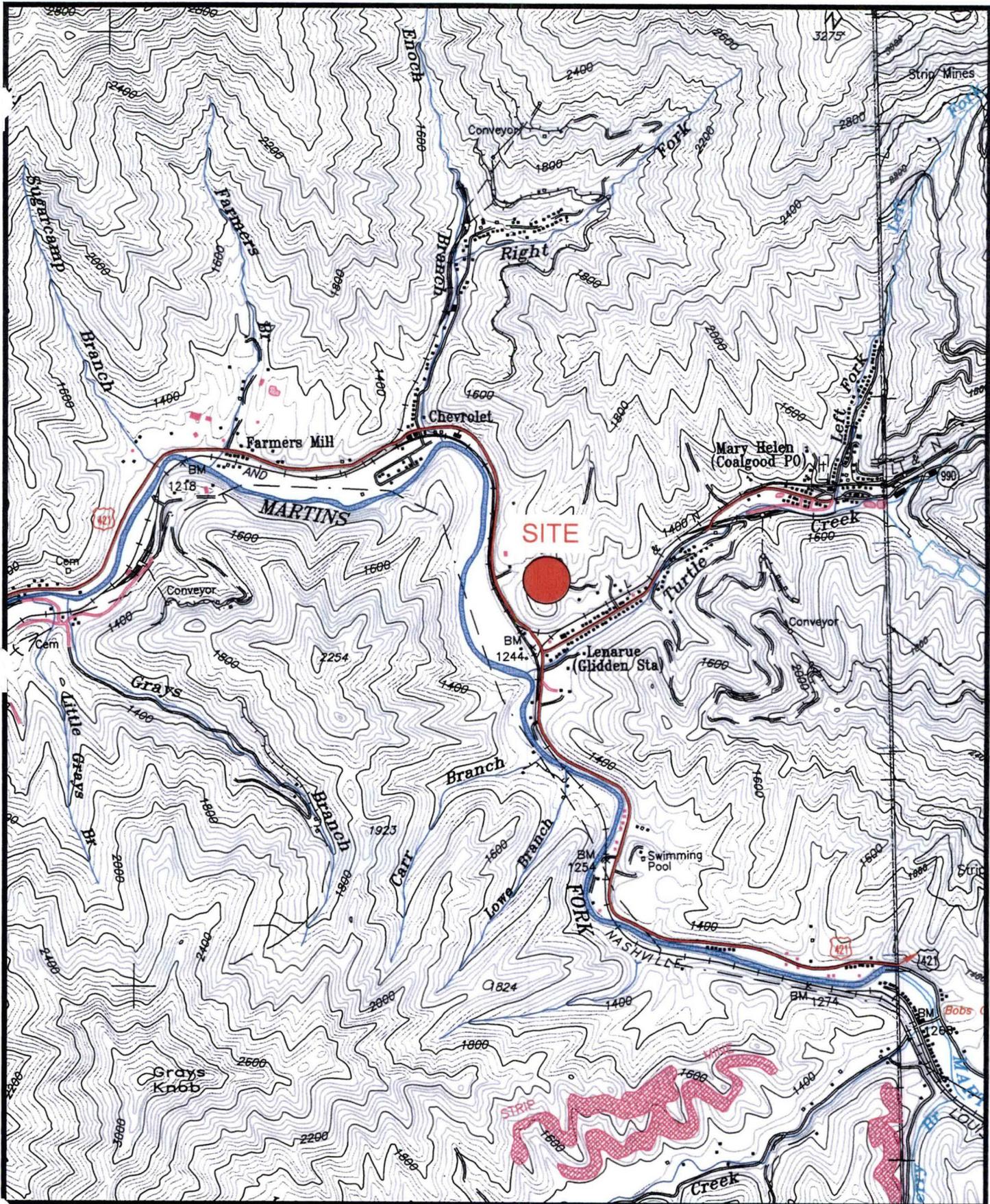
## 2.0 PROJECT DESCRIPTION

The proposed communication facility will consist of a self-supporting tower of undetermined height and ancillary support areas. The construction area will be approximately 40 ft. x 40 ft. Based upon information provided, we estimate the structural loads will be similar to 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 are significantly different than these expected values, ErMC<sup>2</sup> should be notified to reevaluate the recommendations provided in this report.





Drawn:	Date: 12/2/15
Job:	Scale: 1"=2000'
Drawing: USGS SITE MAP	

APPALACHIAN WIRELESS  
 LENARUE SITE MAP  
 FIGURE 1



921 Beasley Street, Suite 145  
 Lexington, KY 40509  
 (859)381-1000  
 engineering@ermc2.us

### **3.0 SITE DESCRIPTION & HISTORICAL MINING**

The site location is a relatively flat existing fill area. The site has good vegetative cover, with natural hillsides to the north and east. The fill is approximately 40 feet deep.

ErMC<sup>2</sup> reviewed available historical mine maps from the Kentucky Division of Mine Safety, Kentucky Mine Mapping Information System ("KMMIS"). Based on available data, no historical surface or underground mining has occurred.

The site appears to have been constructed to store road-cut material. The site was previously used as a recreational site, as evidenced by the abandoned sand volleyball court and building foundation.

### **4.0 FIELD EXPLORATION**

#### **4.1 SITE INFORMATION**

A boundary retracement survey was conducted on the Lenarue property and provided to ErMC<sup>2</sup>. A proposed lot description and easement for access is included in the Appendix of this report. The proposed tower lot was established and tied to the existing boundary. An estimated pad location was determined and boring locations were placed at the corners of proposed concrete pad for the towers support.

#### **4.2 BORING DATA**

Four (4) borings were made in the relative positions shown on the Boring Location Map in Appendix A. The boring logs and resulting data are also included in Appendix A. The borings were 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 ERMC<sup>2</sup> laboratory for study. The depths where these "A"-type split-spoon samples were collected are noted on the





Drawn:	Date: 12/2/15
Job:	Scale: 1"=2000'
Drawing: GQ SITE MAP	

APPALACHIAN WIRELESS  
 LENARUE SITE  
 FIGURE 2



21 Beasley Street, Suite 145  
 Lexington, KY 40509  
 (859)381-1000  
 engineering@ermc2.us

boring logs. The results of the natural moisture contents by boring and interval are shown in Table 1.

TABLE 1  
RESULTS OF NATURAL MOISTURE CONTENT TESTS (ASTM D-4643)

BORING NO.	DEPTH INCREMENT, (FT.)	NATURAL MOISTURE CONTENT, %
B1	0.0-1.5	10.7%
B1	4.0-5.5	11.5%
B1	14.0-15.5	8.5%
B1	19.0-20.5	7.3%
B1	24.0-25.5	7.9%
B2	4.0-5.5	9.2%
B2	9.0-10.5	6.5%
B2	14.0-15.5	7.1%
B2	19.0-20.5	7.4%
B2	24.0-25.5	5.5%
B3	1.0-2.5	1.2%
B3	15.0-20.5	4.7%
B4	0.0-1.5	3.7%
B4	9.0-10.5	8.1%
B4	14.0-15.5	4.4%
B4	19.0-20.5	7.9%
B4	24.0-25.5	4.7%

In order to determine the depth of the existing fill, boring B-4 was extended to auger refusal to a depth of 26.4 ft. at which point a ten foot NX core was taken in this rock.

#### 4.3 GROUNDWATER

Groundwater observations were made during the drilling operations (by noting the depth to water on the drilling tools) and in the open boreholes following withdrawal of the drilling augers. No groundwater levels were noted during drilling activities.



#### **4.4 SEISMIC SITE CALSSIFICATION**

Based on the encountered soil conditions at the project site, the site classification was determined to be "Site Class E" per the Kentucky Building Code. In addition, a  $S_{DS}$  coefficient of 0.521g was calculated, and a  $S_{D1}$  coefficient of 0.232 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 tri-pole 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 attempt to overturn and can act in any directions.

#### **5.2 FOUNDATIONS**

It is our understanding that the foundations for these structures can be designed to bear on low bearing pressure soils. This report demonstrates the different expected bearing capacities based upon the type of material encountered from the boring logs and sampling taken at the site.

Approximately 26 to 40 feet of fill is present at this proposed location. It consists of mixture of shale, sandstones and clay material. Standard penetrations test were conducted on five foot intervals in this material. If shallow footings are used the expected depth of excavations will not exceed 12 ft. in depth.

The approximate elevation of the surface of the site is 1350 ft. The standard penetration tests were conducted on five foot intervals within the fill material. The blow counts (N) ranged from 2 to 50/1" to the depth of 25.5 feet.

#### **5.3 SHALLOW FOUNDATIONS**

Typically we do not recommend shallow foundations on sites consisting of spoil. Settlement can and is likely to occur once the final structure's loading is in place. No settlement calculations have been evaluated for this report. If shallow foundations are



used it should be noted that the material type and bearing capacity can vary significantly due to the inconsistency of the underlying material. Based upon the laboratory and field testing, visual inspection of the materials and practical experience we have estimated that the bearing capacity of the soils to be at 1,000 psf.

If shallow foundations are used we recommend that site be over excavated to a minimum of ten ft. below the footing subgrade and ten ft. outside the footing area. Any large rock and unsuitable material be removed and backfilled with a select backfill or dense grade aggregate. The material is to be placed in 8 inch horizontal lifts, compacted to not less than 95% of the maximum density as determined in accordance with the standard Proctor dry unit weight (ASTM D-968) and within +2% and -2% of the optimum moisture content. This remediation would assist in preventing differential settlement.

#### **5.4 DEEP FOUNDATIONS**

Auger refusal was encountered at approximately 26.4 feet below the surface. A rock core was taken of brown sandstone, grey shale w/ sandstone fragments, and coal with a RQD value of 31. The bearing capacity for this is 6 tsf. We recommend drilled piers. This would minimize the potential settlement issues addressed above. They should be 4000 psi reinforced concrete and a minimum of 24 in. diameter piers socketed into competent rock a minimum of 18 in. deep.

#### **5.6 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 foot 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 have a tendency 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 ErMC<sup>2</sup> 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.

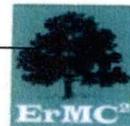
### **6.1 SUBSURFACE EXPLORATION**

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 for the measured water level to coincide with the groundwater table.

### **6.2 LABORATORY AND FIELD TESTS**

Laboratory and field tests are performed in accordance with specific ASTM standards unless otherwise indicated. All determinations included in a given ASTM standard are



not always required and performed. Each test report indicates the measurements and determinations actually 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 on 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 Lenarue Property located in Harlan 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 own conclusions regarding specific construction techniques and methods chosen. ErMC<sup>2</sup> 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 mean the Owner designated design engineer.

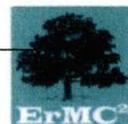
**1.2.4** Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any work under the terms of these specifications.

**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 - 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 Contractor's survey crew will verify alignment with instruments. If plumbness and alignment are not within tolerance as determined by the Contractor's 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 prior to 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.



### III - 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.

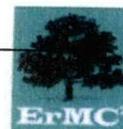
This work is to be accomplished under the constant and continuous supervision of the Owner or his designated representative.

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 on the basis of 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 at this time. 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.

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 at all times.



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 at all times during benching and filling of the benches, to insure 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**

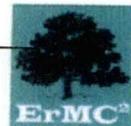
The Contractor shall furnish, operate, and maintain such equipment as is necessary to construct uniform layers, and control smoothness of grade for maximum compaction and drainage.

#### **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.



## IV 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 with regard to 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 (at all times 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.



## 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 handles 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 effect 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, waterstops, 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**

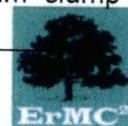
Reinforcement at the time concrete is placed shall be free from rust, scale or other coatings that will destroy or reduce the bond.

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.

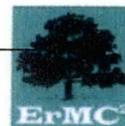
## 8.0 DEPOSITING CONCRETE

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 so as to avoid washing the freshly deposited concrete.
3. Coat 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

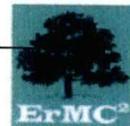


required, canvas "elephant trunks" or galvanized iron chutes equipped with suitable hopper heads shall be employed and a sufficient number placed to insure that the concrete may be effectively compacted into horizontal layers not exceeding 12 inches in thickness with minimum lateral movements.

- 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 so as 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 so as to be free from voids, pockets or honeycombing. Particular care shall be taken to provide impermeability.
- E. Vibration Equipment: Vibration equipment shall be of the appropriate type and shall, at all times, 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 in order 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 its 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 corrected, protrusions removed, and holes filled.



**APPENDIX A BORING DATA AND TESTING**











# USGS Design Maps Summary Report

## User-Specified Input

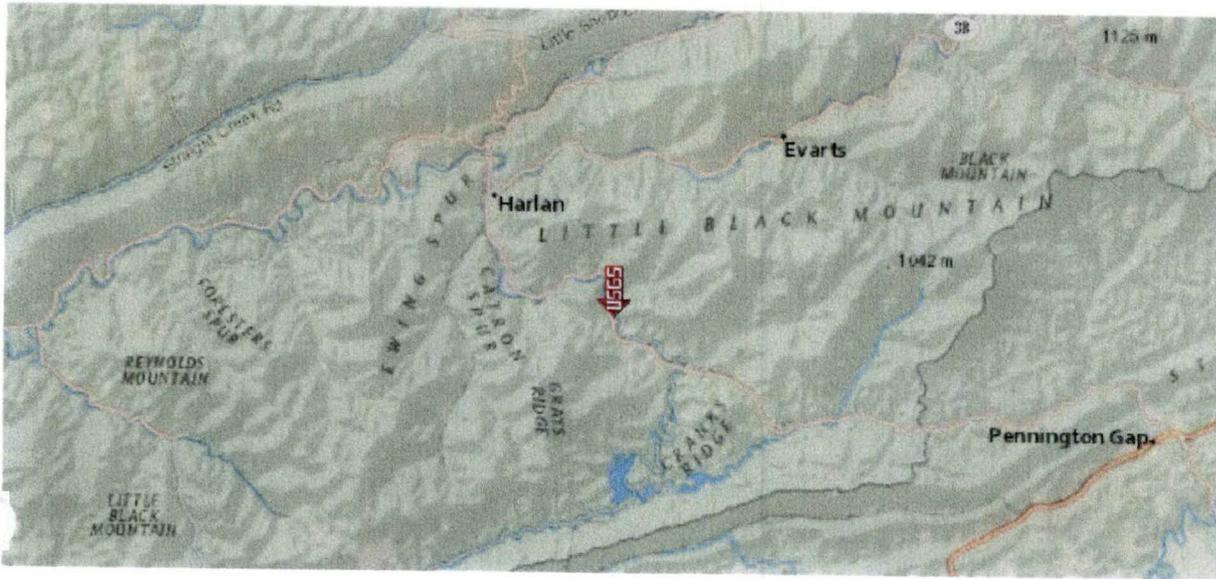
**Report Title** Lenarue Tower Site  
Tue December 15, 2015 15:34:22 UTC

**Building Code Reference Document** 2006/2009 International Building Code  
(which utilizes USGS hazard data available in 2002)

**Site Coordinates** 36.8091°N, 83.26851°W

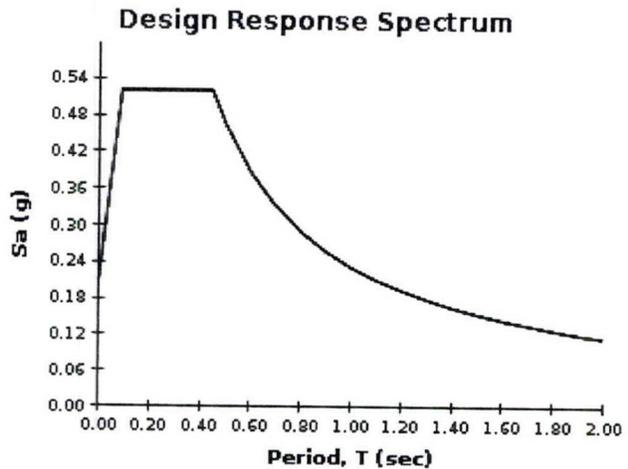
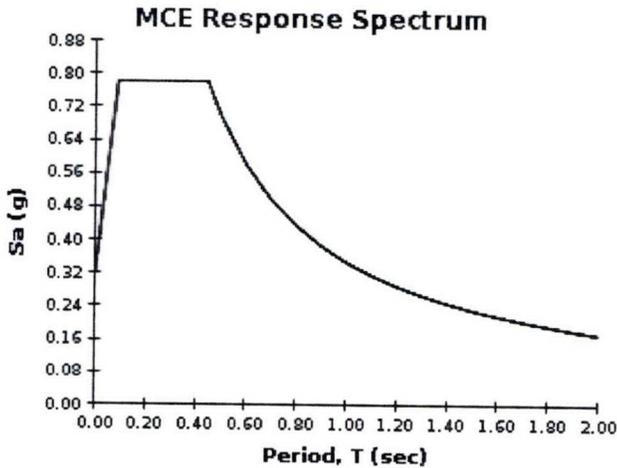
**Site Soil Classification** Site Class E - "Soft Clay Soil"

**Occupancy Category** IV



## USGS-Provided Output

$S_s = 0.368 \text{ g}$	$S_{MS} = 0.781 \text{ g}$	$S_{DS} = 0.521 \text{ g}$
$S_1 = 0.100 \text{ g}$	$S_{M1} = 0.348 \text{ g}$	$S_{D1} = 0.232 \text{ g}$



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

**APPENDIX B MAPS**



LINE	BEARING	DISTANCE
L1	N 21°26'13" E	76.16'
L2	N 43°14'18" E	42.43'
L3	N 53°46'11" E	49.33'
L4	N 69°13'02" E	33.50'
L5	N 78°35'08" E	41.25'
L6	N 83°10'13" W	46.27'
L7	S 74°44'47" E	71.47'
L8	N 60°22'33" W	53.60'
L9	N 46°46'09" W	42.43'
L10	N 24°57'50" W	76.16'

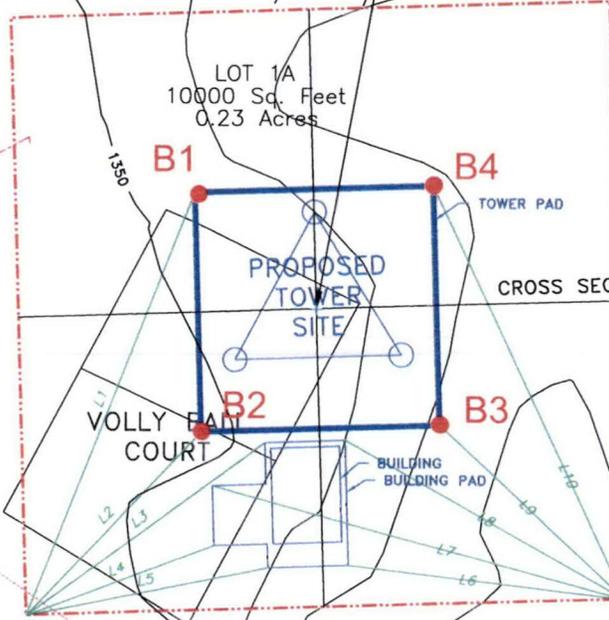
APPALACHIAN WIRELESS  
 101 TECHNOLOGY TRAIL  
 IVEL, KY. 41642  
 PROPOSED TOWER  
 NEAR LENARUE IN HARLAN COUNTY

LAT:36°48'32.7775"  
 LON:83°16'06.6443"  
 N:3463736.36  
 E:5647702.79  
 Z:1350.48

DRAWING PROVIDED BY  
 APPALACHIAN WIRELESS

COAP, INC  
 PROPERTY  
 BOOK 338 PAGE 33

LOT 1A  
 10000 Sq. Feet  
 0.23 Acres



LARRY G. & DEBRA ANN HUBBS  
 BOOK 436 PAGE 545

POWER POLE

POWER LINE

RIP RAP CHANNEL

REID P. & FAYE BROCK  
 PROPERTY  
 BOOK 136 PAGE 470

COAP, INC  
 PROPERTY  
 BOOK 338 PAGE 33

CONCRETE  
 PAD

SURVEY STA SET FOUND  
 IRON PIN WITH CAP (18" X .5" REBAR PLASTIC CAP MARKED L52159)  
 BOUNDARY LINE  
 ACCESS ROAD  
 PARENT TR LINE

-THE PROPOSED TOWER HAS BEEN LOCATED USING DUAL FREQUENCY GPS UNIT PROCESSED BY "OPUS"  
 -STATE PLANE COORDINATES NAD 83 KY SINGLE ZONE N:3463736.36 E:5647702.79 EL:1350.48 EXISTING GR PLAN- FOUNDATION EL1352.0'-TOP TOWER EL 1652.0'  
 -PRECISION: HORIZONTAL=0.30' VERTICAL=0.50'  
 -THIS SURVEY MEETS OBSTACLE ACCURACY CODE 2C.  
 -PROPERTY LINE INFORMATION TAKEN FROM DEEDS AND VERIFIED IN THE FIELD.

I HEREBY CERTIFY THAT THIS DOCUMENT  
 WAS PREPARED BY ME OR UNDER MY DIRECTION.

JAMES W. CAUDILL PE# DATE

PROPOSED SITE PLAN AND STRUCTURE LOCATION  
 LENARUE TOWER APPALACHIAN WIRELESS

DRAWN JWC	DATE 10/08/15	LENARUE TOWER C.O.A.P. LENARUE, KY HARLAN COUNTY
APPROVED	DATE	
SCALE 1" = 20'	SHEET 2 OF 3	PROJECT NO. LENARUE/LESITE20





World Tower  
COMPANY, INC.

1213 Compressor Drive  
P.O. Box 508  
Mayfield, KY 42066  
270-247-3642  
FAX: 270-247-0909  
E-mail: [worldtower@worldtower.com](mailto:worldtower@worldtower.com)  
Web: [www.worldtower.com](http://www.worldtower.com)

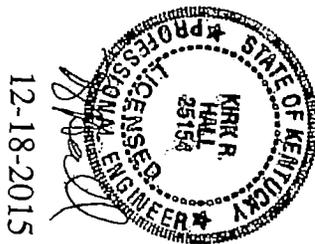
300' MODEL WSST TOWER  
FOR: APPALACHIAN WIRELESS  
SITE: LENARUE, KY  
DESIGN PACKAGE



12-18-2015

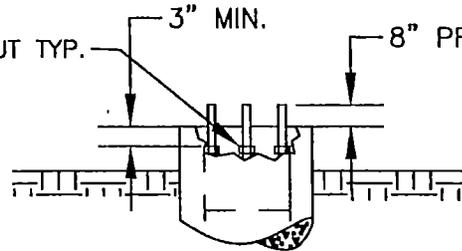
# GENERAL NOTES

1. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISION OF THE AMERICAN WELDING SOCIETY AWS. D 1.1.
2. TOWER AND ALL FABRICATED ACCESSORIES ARE HOT-DIP GALVANIZED.
3. ALL BOLTS SHALL BE GALVANIZED ACCORDING TO THE STANDARD SPECIFICATION FOR ZINC COATING OF IRON AND STEEL HARDWARE ASTM A153.
4. LEG STEEL IS 50 KSI MIN YIELD SOLID ROUND OR PIPE AND BRACING STEEL IS 36 KSI MIN YIELD SOLID ROUND OR STRUCTURAL ANGLE.
5. ALL STRUCTURAL BOLTS ARE ASTM A325.
6. TOWER SHOULD BE INSPECTED IN ACCORDANCE WITH TIA-222-G EVERY 5 YEARS.
7. TOWER INSPECTION SHOULD ONLY BE PERFORMED BY EXPERIENCED QUALIFIED PERSONNEL. FOR ASSISTANCE IN PROPER MAINTENANCE OF YOUR TOWER, CALL WORLD TOWER AT 270-247-3642.



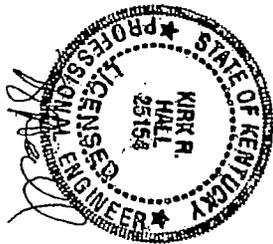
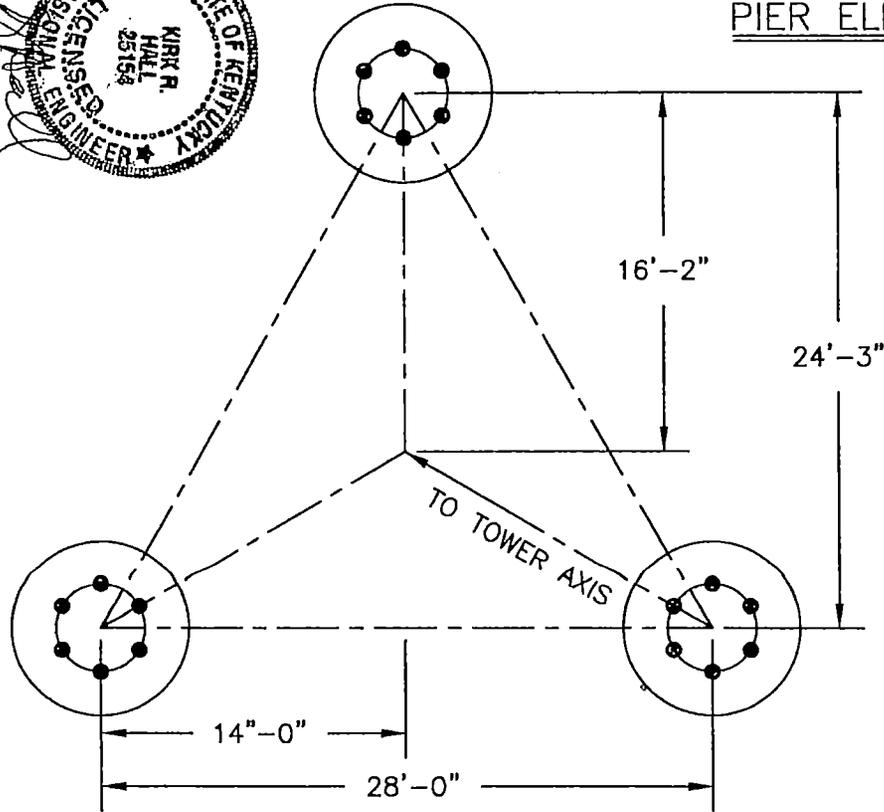
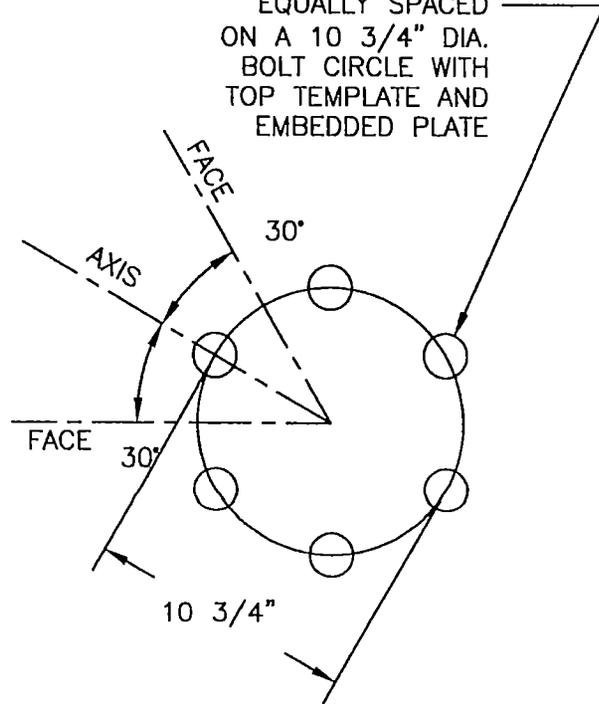
<b>WORLD TOWER</b>			
TITLE: 300' MODEL WSST TOWER FOR: APPALACHIAN WIRELESS SITE: LENARUE, KY			
SCALE	DWN.	LKG	CKD.
FILE	DWG. NO.		DATE 12-17-15
			Q15798N

GALVANIZED NUT TYP. 3" MIN. 8" PROJ.



PIER ELEVATION

ANCHOR BOLTS  
 (6) 1 1/2"  $\phi$  X 84"  
 (ASTM A354 GR. BC)  
 EQUALLY SPACED  
 ON A 10 3/4" DIA.  
 BOLT CIRCLE WITH  
 TOP TEMPLATE AND  
 EMBEDDED PLATE



12-18-2015

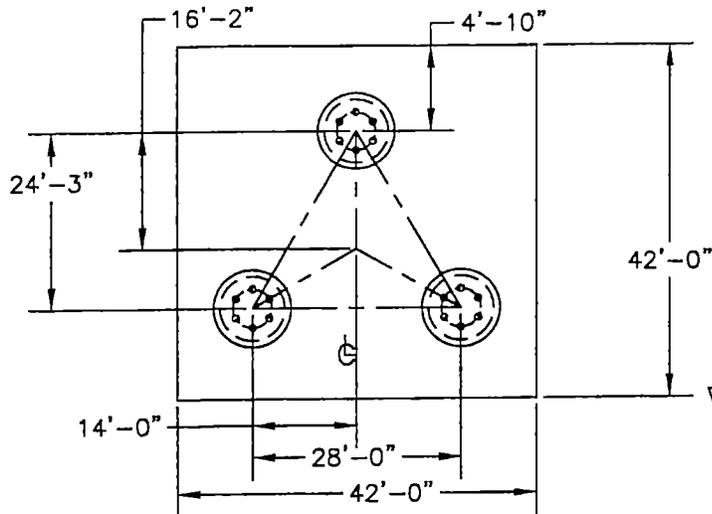
TITLE:

300' MODEL WSST TOWER  
 FOR: APPALACHIAN WIRELESS  
 SITE: LENARUE, KY

# WORLD TOWER

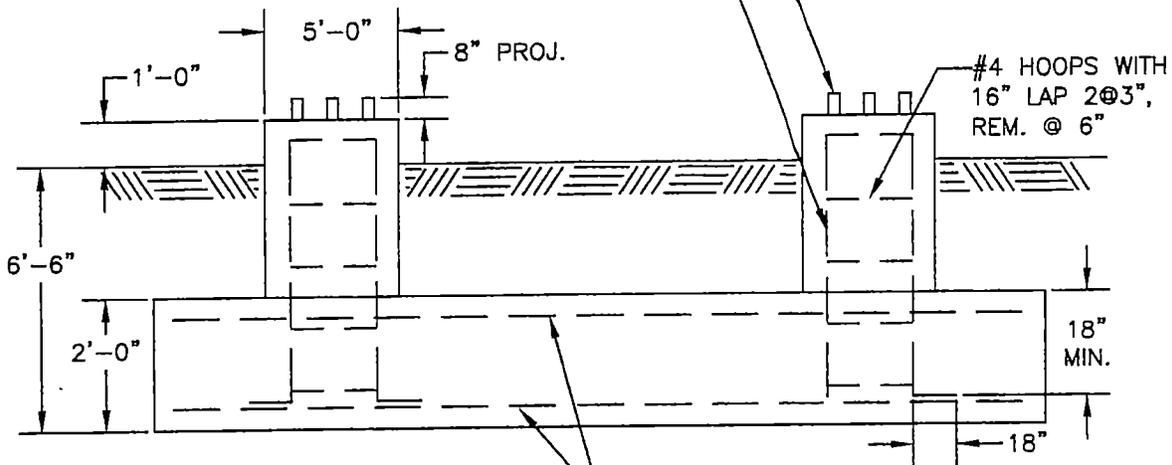
SCALE NONE DWN. LKG CKD. DATE 12-17-15

FILE DWG. NO. Q15798AB



142.8 CU. YDS.  
CONCRETE REQ'D.

BASE REACTIONS	
OTM:	13612.0 FT. KIPS
COMP.	595.0 KIPS
UPLIFT	501.0 KIPS
SHEAR (3 LEGS)	87.0 KIPS
WT. NO ICE	100.0 KIPS
WT. 1/2" ICE	247.0 KIPS



20 #8 VERT. REBARS  
WITH 90° A.C.I. BEND  
AT BOTTOM

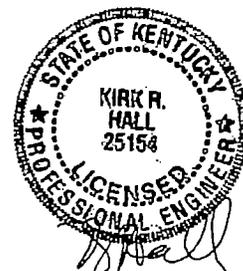
ANCHOR BOLTS  
EMBEDDED PLATE AT BOTTOM

#4 HOOPS WITH  
16" LAP 2@3",  
REM. @ 6"

42-#11 REBARS  
EACH WAY TOP AND BOTTOM  
(168 TOTAL)

### GENERAL NOTES

1. CONCRETE TO HAVE 4000 PSI MIN. COMPRESSIVE STRENGTH AFTER 28 DAYS.
2. ALL REINFORCEMENT STEEL IS DEFORMED AND MEETS THE STRENGTH REQUIREMENTS OF ASTM A615 GRADE 60.
3. EMBEDDED STEEL TO HAVE 3" MIN. CONCRETE COVER.
4. FOUNDATION DESIGN IS BASED ON CUSTOMER SUPPLIED SOIL DATA FROM ERM2. PROJECT NUMBER 165-000-0010 DATED DECEMBER 15, 2015.
5. OVER EXCAVATION AND COMPACTION REQUIRED AT SITE. SEE SOILS REPORT.



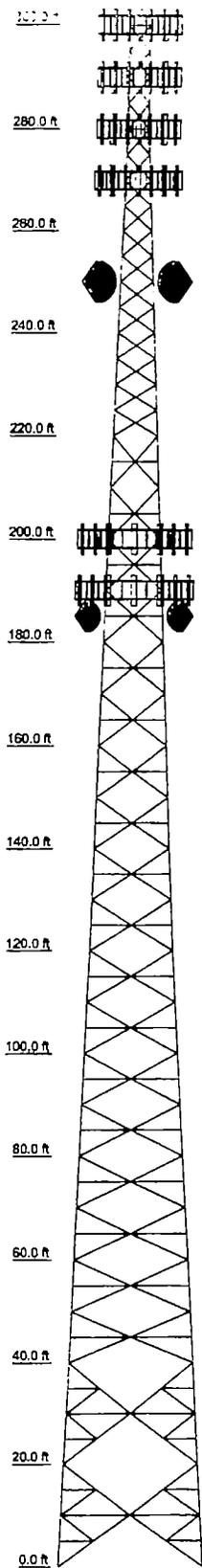
12-18-2015

TITLE: FOUNDATION DETAIL  
300' WSST TOWER  
FOR: APPALACHIAN WIRELESS  
SITE: LENARUE, KY

# WORLD TOWER

SCALE NONE	DWN.	LKG	CKD.	DATE 12-17-15
FILE	DWG. NO.		Q15798F	

Legs	SR 4 1/4	SR 4	SR 3 1/4	SR 3	SR 2 3/4	SR 2 1/2	SR 2 1/4	SR 1 3/4
Diagonals	L4x4x1/4	L3 1/2x3 1/2x1/4	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Diagonal Grade	L4x4x5/16	L3 1/2x3 1/2x1/4	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Top Girts	L4x4x1/4	L3 1/2x3 1/2x1/4	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Horizontal	L4x4x1/4	L3 1/2x3 1/2x1/4	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Red. Horizontal	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Red. Diagonals	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	L2x2x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Inner Bracing	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4					
Face Width (ft)	28	24	20	18	16	14.8	13	11.6
# Panels @ (ft)	4 @ 10	4 @ 10	4 @ 10	4 @ 10	4 @ 10	4 @ 10	4 @ 10	4 @ 10
Weight (K)	57.6	48	40	32	24	16	10	6.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Beacon Lighting	300	(2) WPA800102/4CF w/ mt pipe	270
(2) WPA800102/4CF w/ mt pipe	300	BXA-70063-6CF w/ mt pipe	270
(2) WPA800102/4CF w/ mt pipe	300	BXA-70063-6CF w/ mt pipe	270
(2) WPA800102/4CF w/ mt pipe	300	BXA-70063-6CF w/ mt pipe	270
BXA-70063-6CF w/ mt pipe	300	WD13X53 Antenna Mounting Frame	270
BXA-70063-6CF w/ mt pipe	300	WD13X53 Antenna Mounting Frame	270
BXA-70063-6CF w/ mt pipe	300	WD13X53 Antenna Mounting Frame	270
WD13X53 Antenna Mounting Frame	300	(3) RRU-11	289.5
WD13X53 Antenna Mounting Frame	300	8 FT DISH	250
WD13X53 Antenna Mounting Frame	300	8 FT DISH	250
(3) RRU-11	289.5	(2) WPA800102/4CF w/ mt pipe	200
(2) WPA800102/4CF w/ mt pipe	290	BXA-70063-6CF w/ mt pipe	200
(2) WPA800102/4CF w/ mt pipe	290	BXA-70063-6CF w/ mt pipe	200
(2) WPA800102/4CF w/ mt pipe	290	BXA-70063-6CF w/ mt pipe	200
BXA-70063-6CF w/ mt pipe	290	WD13X53 Antenna Mounting Frame	200
BXA-70063-6CF w/ mt pipe	290	WD13X53 Antenna Mounting Frame	200
BXA-70063-6CF w/ mt pipe	290	WD13X53 Antenna Mounting Frame	200
WD13X53 Antenna Mounting Frame	290	(2) WPA800102/4CF w/ mt pipe	200
WD13X53 Antenna Mounting Frame	290	(2) WPA800102/4CF w/ mt pipe	200
WD13X53 Antenna Mounting Frame	290	(3) RRU-11	199.5
(3) RRU-11	289.5	(2) WPA800102/4CF w/ mt pipe	190
(2) WPA800102/4CF w/ mt pipe	280	BXA-70063-6CF w/ mt pipe	190
(2) WPA800102/4CF w/ mt pipe	280	BXA-70063-6CF w/ mt pipe	190
(2) WPA800102/4CF w/ mt pipe	280	BXA-70063-6CF w/ mt pipe	190
BXA-70063-6CF w/ mt pipe	280	WD13X53 Antenna Mounting Frame	180
BXA-70063-6CF w/ mt pipe	280	WD13X53 Antenna Mounting Frame	180
BXA-70063-6CF w/ mt pipe	280	WD13X53 Antenna Mounting Frame	180
WD13X53 Antenna Mounting Frame	280	(2) WPA800102/4CF w/ mt pipe	190
WD13X53 Antenna Mounting Frame	280	(2) WPA800102/4CF w/ mt pipe	190
WD13X53 Antenna Mounting Frame	280	(3) RRU-11	189.5
(3) RRU-11	279.5	8 FT DISH	185
(2) WPA800102/4CF w/ mt pipe	270	8 FT DISH	185
(2) WPA800102/4CF w/ mt pipe	270		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16		

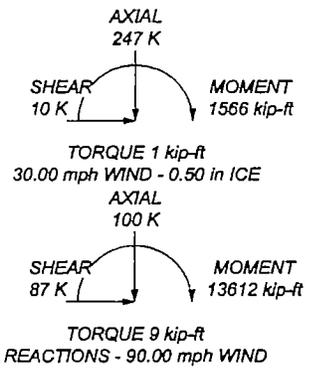
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 90.00 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 30.00 mph basic wind with 0.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60.00 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 99.6%

UPLIFT: -501 K  
SHEAR: 47 K



12-18-2015

<b>World Tower Company</b>	Job: 300' WSSST Tower / Job Q15-797 to 800
1213 Compressor Drive	Project: Std Ky
Mayfield, KY 42066	Client: Appalachian Wireless
	Drawn by: kirk
	App'd:



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

Aeronautical Study No.  
 2015-ASO-16725-OE

Issued Date: 12/03/2015

Ali Kuzehkanani  
 East Kentucky Network, LLC  
 8300 Greensboro Drive, Suite 1200  
 McLean, VA 22102

**\*\* 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 Lenarue (Tower)  
 Location: Lenarue, KY  
 Latitude: 36-48-32.77N NAD 83  
 Longitude: 83-16-06.64W  
 Heights: 1352 feet site elevation (SE)  
 310 feet above ground level (AGL)  
 1662 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:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

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)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

This determination expires on 06/03/2017 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 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 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.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

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 (817) 222-5932. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-ASO-16725-OE.

**Signature Control No: 268574745-274133648**

( DNE )

Joan Tengowski  
Technician

Attachment(s)  
Frequency Data  
Map(s)

cc: FCC

Frequency Data for ASN 2015-ASO-16725-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	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
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
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W





**KENTUCKY AIRPORT ZONING COMMISSION**

**STEVEN BESHEAR**  
Governor

90 Airport Road, Bldg 400  
Frankfort, KY 40601  
[www.transportation.ky.gov/aviation](http://www.transportation.ky.gov/aviation)  
502 564-4480

December 21, 2015

**APPROVAL OF APPLICATION**

**APPLICANT:**

East Kentucky Network, LLC.  
East Kentucky Network, LLC.  
8300 Greensboro Drive|Suite 1200  
McLean, VA 22102

**SUBJECT: AS-048-135-2015-109**

**STRUCTURE:** Antenna Tower  
**LOCATION:** Lenarue, KY  
**COORDINATES:** 36° 48' 32.77" N / 83° 16' 6.64" W  
**HEIGHT:** 310' AGL/1662'AMSL

The Kentucky Airport Zoning Commission has approved your application for a permit to construct 310'AGL/ 1662'AMSL Antenna Tower near Lenarue, KY 36° 48' 32.77" N / 83° 16' 6.64" 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.

A copy of the approved application is enclosed for your files.

Medium Dual Obstruction Lighting is required in accordance with 602 KAR 50:100.

John Houlihan  
Administrator



An Equal Opportunity Employer M/F/D



**KENTUCKY AIRPORT ZONING COMMISSION**

**STEVEN BESHEAR**  
Governor

90 Airport Road, Bldg 400  
Frankfort, KY 40601  
www.transportation.ky.gov/aviation  
502 564-4480

**CONSTRUCTION/ALTERATION STATUS REPORT**

December 21, 2015

AERONAUTICAL STUDY NUMBER: AS-048-135-2015-109

East Kentucky Network, LLC.  
East Kentucky Network, LLC.  
8300 Greensboro Drive|Suite 1200  
McLean, VA 22102

This concerns the permit which was issued to you by the Kentucky Airport Zoning Commission on December 21, 2015. This permit is valid for a period of 18 Month(s) from its date of issuance. If construction is not completed within the said 18-Month period, this permit shall lapse and be void, and no work shall be performed without the issuance of a new permit. When appropriate, please indicate the status of the project in the place below and return this letter to John Houlihan, Administrator, Kentucky Airport Zoning Commission, 90 Airport Road, Bldg 400, Frankfort, KY, 40601. 502 564-4480.

STRUCTURE: Antenna Tower  
LOCATION: Lenarue, KY  
COORDINATES: 36° 48' 32.77" N / 83° 16' 6.64" W  
HEIGHT: 310' AGL /1662' AMSL

**CONSTRUCTION/ALTERATION STATUS**

1. The project ( ) is abandoned. ( ) is not abandoned.

2. Construction status is as follows:

Structure reached its greatest height of \_\_\_\_\_ ft. AGL  
\_\_\_\_\_ ft. AMSL on \_\_\_\_\_ (date).

Date construction was completed. \_\_\_\_\_

Type of obstruction marking/painting. \_\_\_\_\_

Type of obstruction lighting. \_\_\_\_\_

As built coordinates. \_\_\_\_\_

Miscellaneous Information. \_\_\_\_\_

DATE \_\_\_\_\_

SIGNATURE/TITLE \_\_\_\_\_





## KENTUCKY AIRPORT ZONING COMMISSION

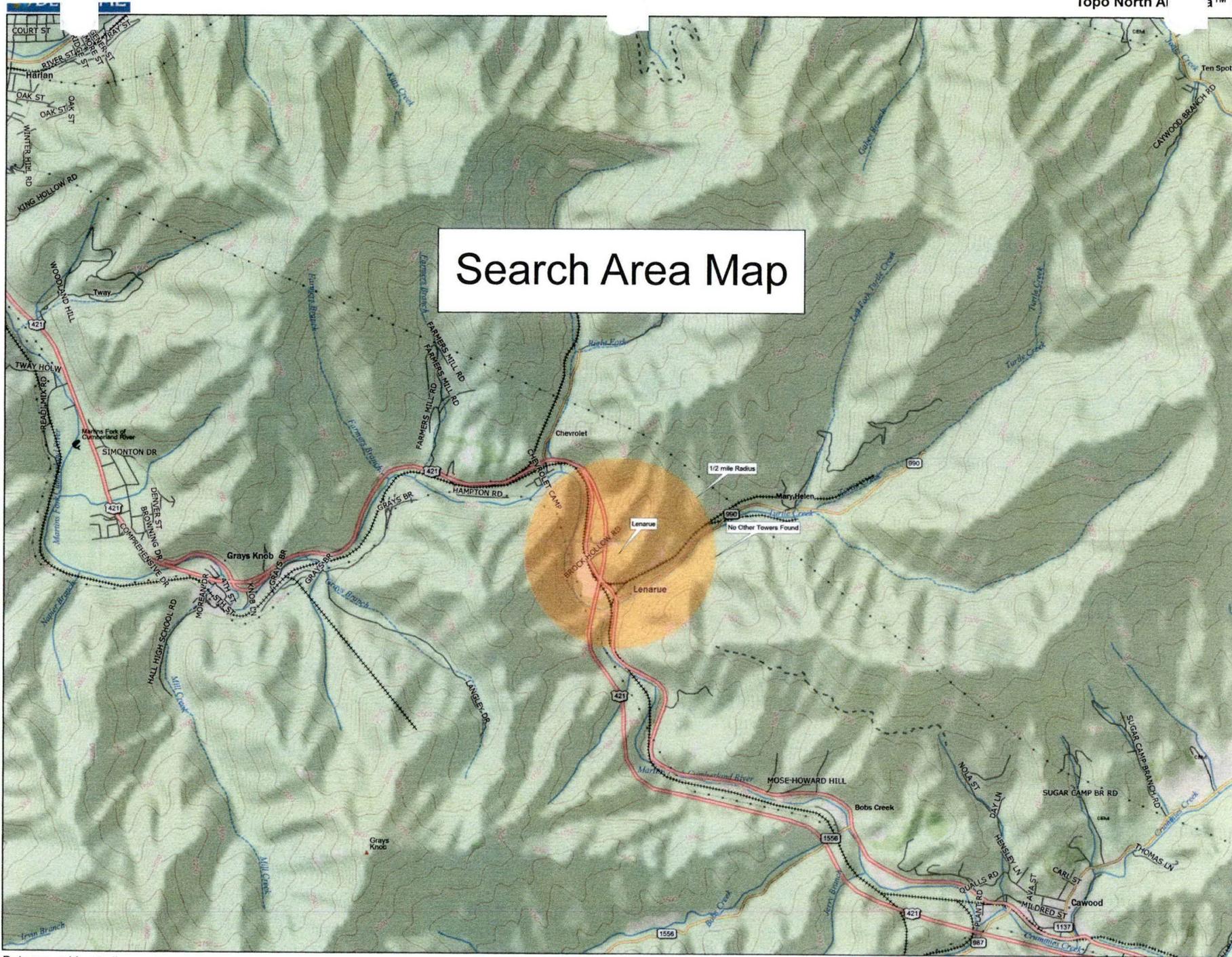
## APPLICATION FOR PERMIT TO CONSTRUCT OR ALTER A STRUCTURE

APPLICANT (name) East Kentucky Network, LLC c/o LNGS		PHONE 703-584-8667	FAX 703-584-8692	KY AERONAUTICAL STUDY # 13-048-135-205-109	
ADDRESS (street) 8300 Greensboro Dr, #1200		CITY McLean		STATE VA	ZIP 22102
APPLICANT'S REPRESENTATIVE (name) Ali Kuzehkanani		PHONE 703-584-8667	FAX 703-584-8692		
ADDRESS (street) 8300 Greensboro Dr, #1200		CITY McLean		STATE VA	ZIP 22102
APPLICATION FOR <input type="checkbox"/> New Construction <input checked="" type="checkbox"/> Alteration <input type="checkbox"/> Existing				WORK SCHEDULE	
DURATION <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary (months days )				Start 11/25/15 End 11/30/15	
TYPE <input type="checkbox"/> Crane <input type="checkbox"/> Building <input checked="" type="checkbox"/> Antenna Tower <input type="checkbox"/> Power Line <input type="checkbox"/> Water Tank <input type="checkbox"/> Landfill <input type="checkbox"/> Other		MARKING/PAINTING/LIGHTING PREFERRED <input type="checkbox"/> Red Lights & Paint <input type="checkbox"/> White- medium intensity <input type="checkbox"/> White- high intensity <input checked="" type="checkbox"/> Dual- red & medium intensity white <input type="checkbox"/> Dual- red & high intensity white <input type="checkbox"/> Other			
LATITUDE 36°48'32.77"		LONGITUDE 83°16'06.64"		DATUM <input checked="" type="checkbox"/> NAD83 <input type="checkbox"/> NAD27 <input type="checkbox"/> Other	
NEAREST KENTUCKY City Lenarue County Harlan ✓		NEAREST KENTUCKY PUBLIC USE OR MILITARY AIRPORT Tucker-Guthrie Memorial Airport			
SITE ELEVATION (AMSL, feet) 1352		TOTAL STRUCTURE HEIGHT (AGL, feet) 310		CURRENT (FAA aeronautical study #)	
OVERALL HEIGHT (site elevation plus total structure height, feet) 1662				PREVIOUS (FAA aeronautical study #)	
DISTANCE (from nearest Kentucky public use or Military airport to structure) 6.1 mi				PREVIOUS (KY aeronautical study #)	
DIRECTION (from nearest Kentucky public use or Military airport to structure) NW					
DESCRIPTION OF LOCATION (Attach USGS 7.5 minute quadrangle map or an airport layout drawing with the precise site marked and any certified survey.) East of US-421, on the north side of Lenarue (Harlan), KY					
DESCRIPTION OF PROPOSAL An new 300' tower with top-mounted antennas (overall height of 310' AGL)					
FAA Form 7460-1 (Has the "Notice of Construction or Alteration" been filed with the Federal Aviation Administration?) <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes, when? 10/14/15					
CERTIFICATION (I hereby certify that all the above entries, made by me, are true, complete, and correct to the best of my knowledge and belief.)					
PENALTIES (Persons failing to comply with KRS 183.861 to 183.990 and 602 KAR 050 are liable for fines and/or imprisonment as set forth in KRS 183.990(3). Noncompliance with FAA regulations may result in further penalties.)					
NAME Ali Kuzehkanani	TITLE Dir of Engineering	SIGNATURE <i>Ali Kuzehkanani</i>		DATE 10/14/15	
COMMISSION ACTION <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved					
SIGNATURE <i>[Signature]</i>				DATE 12-21-15	

## Driving Directions for Lenarue Site

From the Harlan County Courthouse located at the intersection of First Street and Central Street take Central Street 1/10 of a mile to the jct. of Central Street and 421. Turn left onto 421 and go 5.6 miles, then turn left (signs will be posted). Stay to the right on the gravel road. Go thru the gate and approximately 500 feet turn right and the site will be straight ahead (signs will be posted)

Prepared By:  
Daryl Bartley  
Appalachian Wireless  
(606) 791-0310



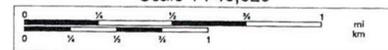
Data use subject to license.

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www.delorme.com



Scale 1 : 40,625



1" = 3,385.4 ft      Data Zoom 12-7

**MEMORANDUM OF LEASE**

THIS MEMORANDUM OF LEASE is made and entered into on this the 11<sup>th</sup> day of September 2015, with a commencement date of September 1<sup>st</sup>, by and between and COAP, INC., a non-profit corporation, with the mailing address of P.O. Box 1617, Harlan, Kentucky, 40831, hereinafter referred to as "Lessors" and East Kentucky Network, LLC d/b/a Appalachian Wireless, with a mailing address of 101 Technology Trail, Ivel, Kentucky, 41642, hereinafter referred to as "Lessee."

**WITNESSETH:**

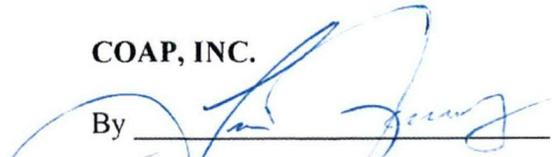
1. **Demised Premises:** For good and valuable consideration, Lessors do hereby lease to Lessee, and Lessee does hereby lease from Lessors, a portion of that certain tract of real estate located in Harlan County, Kentucky, and being a portion of the same land conveyed to Lessors by Deed of Conveyance referenced in Deed Book 338, Page 33, in the Harlan County Clerk's Office. Said property is more particularly described in the description and plat attached hereto and made a part hereof as Exhibits A and B, prepared by James W. Caudill, Licensed Professional Land Surveyor (hereinafter referred to as the "Premises");
2. **Term:** The term of the Lease shall be for a period of five (5) years from the commencement date of the Lease Agreement.
3. **Option to Renew:** Lessee shall have the option to renew the Lease for an additional six (6) terms of five (5) years each.
4. **Binding Effect:** All of the terms, conditions, and covenants hereof shall be binding and shall inure to the benefit of the heirs, representatives, successors, and assigns of the parties hereto.

5. **Purpose:** This Memorandum of Lease is prepared solely for the purpose of recordation, and is not intended, 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 thereunder.

In Witness Whereof, Lessors and Lessee have executed this Memorandum of Lease as of the day, month and year first written above.

**LESSOR:**

**COAP, INC.**

By 

Its 

COMMONWEALTH OF KENTUCKY  
COUNTY OF Harlan

The foregoing instrument was acknowledged before me on this 11<sup>th</sup> day of September, 2015, by Tim Jones on behalf of COAP, INC., Lessor.

  
Notary Public

Feb 3, 2016  
My Commission Expires

LESSEE:

EAST KENTUCKY NETWORK, LLC

By W.A. Gillum

Its CEO/GM

COMMONWEALTH OF KENTUCKY  
COUNTY OF Floyd

The foregoing instrument was acknowledged before me on this 14<sup>th</sup> day of September, 2015, by W.A. Gillum, CEO/General Manager of East Kentucky Network, LLC, d/b/a Appalachian Wireless.

Raeni D. Bradley  
Notary Public

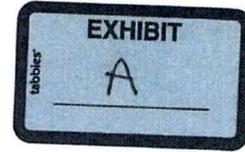
My Commission Expires Feb 3, 2016

This instrument was prepared by:

Frank K. Nall

Frank K. Nall, Attorney at Law  
225 Second Street  
Pikeville, KY 41501

**LOT DESCRIPTION**  
Property of  
C O A P, Inc.  
P.O. Box 1617  
Harlan, KY 40831  
Near Lenarue in Harlan County  
August 28, 2015



A portion of the property lying off Highway 421 in Harlan County of Kentucky, near the community of Lenarue. Being a part of the same land conveyed by deed from Jayne F. Brock, Ramsey Brock, R. Fulton Brock, Susan M Brock, Jayne F Brock, Jon B Brock to C O A P, Inc. by Deed dated September 24, 1998 and recorded in Deed Book 338 Page 33 of the Harlan county Court Clerk.

Unless stated otherwise, any monument referred to herein as "set iron pin with cap" is a set 1/2" diameter rebar, at least eighteen (18") in length, with a plastic cap stamped "LS-2259". All bearings stated herein are referred to a prior survey of the COAP & Hubs Property by Leo Miller & Associates. This survey preformed by James W. Caudill, LS2259, on August 28, 2015.

**Lot 1A**

Beginning on set iron pin with cap marked ls2259 near the edge of the bench, said point being located South 74 deg 40 min 42 sec West, 133.44 feet from a found iron pin with cap marked ls2991 near the hillside; thence severing the land of COAP, Inc (Book 338 Page 33) by running across the bench South 84 deg 54 min 25 Sec East, 100.01 feet to a set iron pin with cap marked ls2259 near the ditch; thence running South 05 deg 07 min 36 sec West, 100.01 feet to a set iron pin with cap marked ls2259 near the ditch; thence running across the bench North 84 deg 53 min 25 sec West, 100.00 feet to a set iron pin with cap marked ls2259 near power line; thence North 05 deg 07 min 14 sec East, 99.98 feet to the beginning. Containing a calculated area of 10000 sq ft or 0.23 acres.

This survey was performed on August 28, 2015 by James W. Caudill, a Kentucky Licensed Professional Land Surveyor No. 2259.

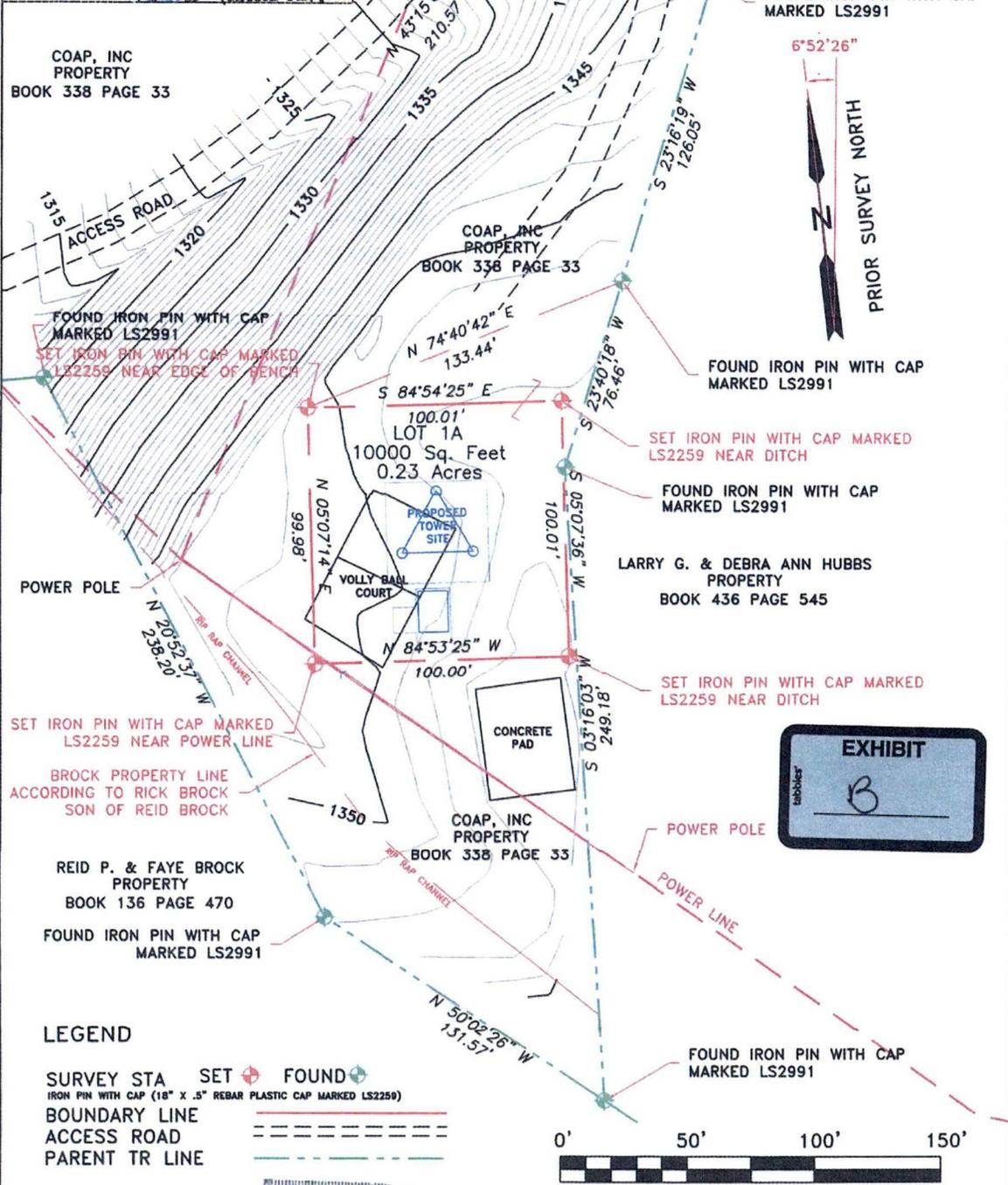


*James W. Caudill*  
James W. Caudill, PLS #2259  
8-28-15



**APPALACHIAN WIRELESS**

101 TECHNOLOGY TRAIL  
IVEL, KY. 41642  
PROPOSED TOWER SITE  
LENARUE IN HARLAN CO



**LEGEND**

SURVEY STA SET  $\oplus$  FOUND  $\oplus$   
 IRON PIN WITH CAP (18" X .5" REBAR PLASTIC CAP MARKED LS2259)  
 BOUNDARY LINE  
 ACCESS ROAD  
 PARENT TR LINE

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

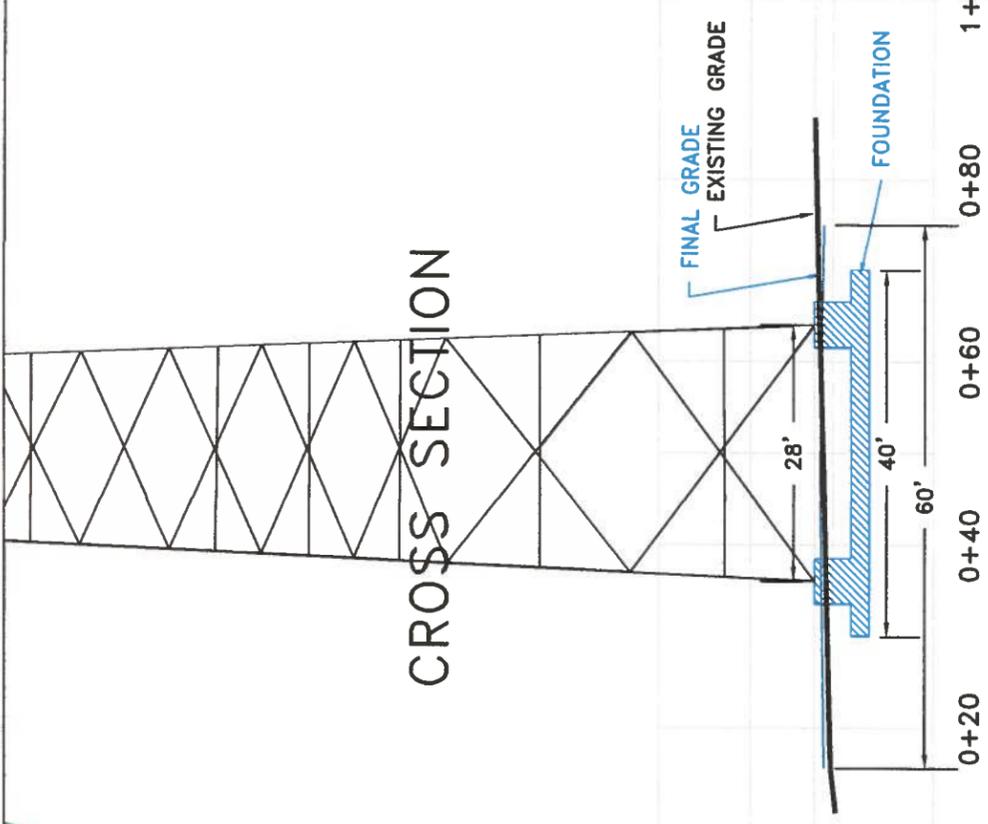
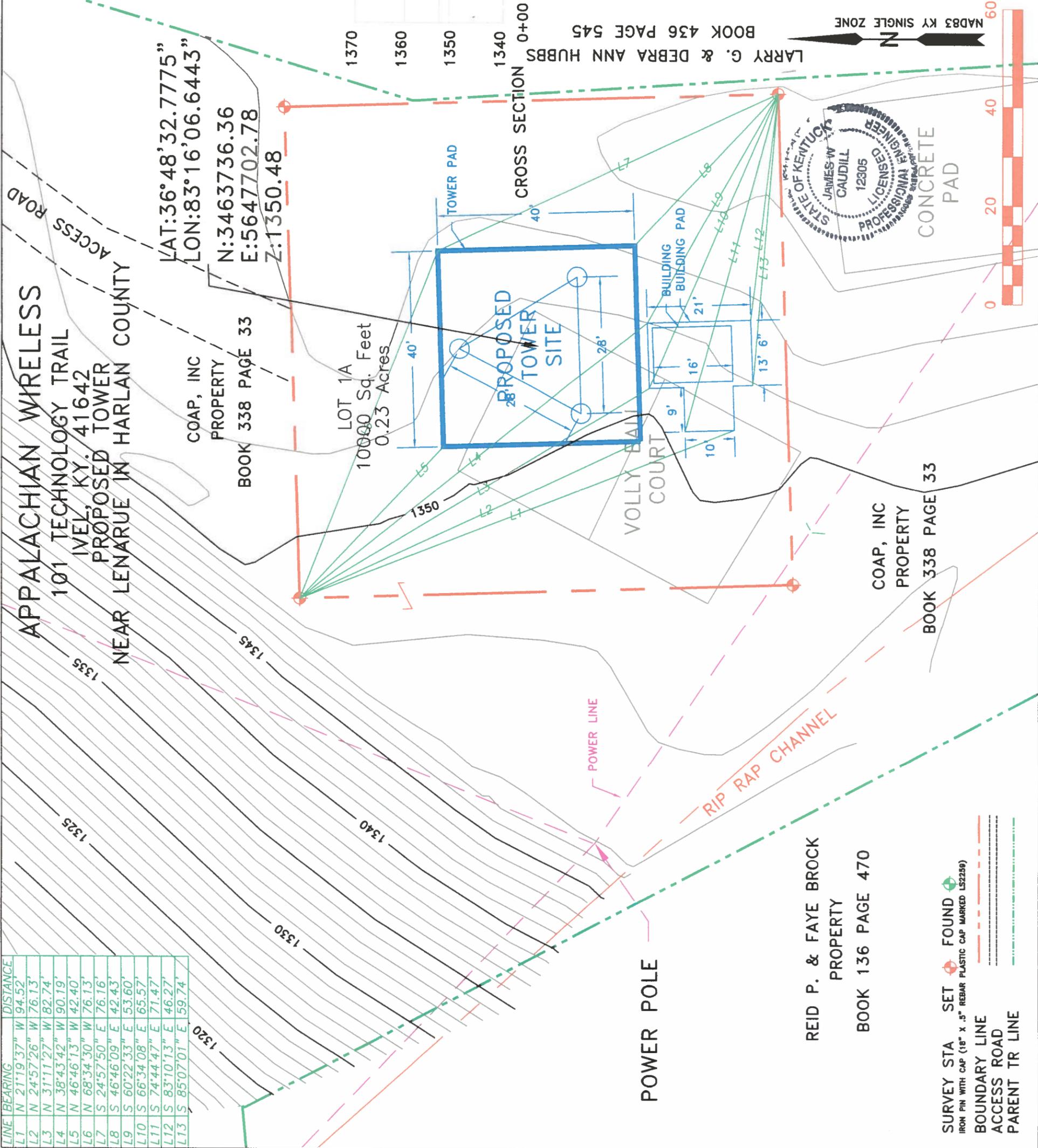
RURAL CLASS SURVEY  
 I HEREBY CERTIFY THAT THIS PLAT DEPICTS A SURVEY, MADE BY ME, BY THE METHOD OF RANDOM TRAVERSE. THE BEARINGS SHOWN HEREON HAVE NOT BEEN ADJUSTED FOR CLOSURE. THIS SURVEY AND PLAT MEETS OR EXCEEDS THE MINIMUM STANDARDS OF GOVERNING AUTHORITIES. THE UNADJUSTED ERROR OF CLOSURE WAS 1 IN 12210

**PLAT OF SURVEY**

<b>DRAWN BY</b> JWC	<b>SURVEY DATE</b> 08/28/2015	<b>SUB DIVISION</b> PROPERTY OF COAP INC. P.O. BOX 1617 HARLAN, KY 40831 NEAR LENARUE IN HARLAN CO DEED BOOK 338 PAGE 33
<b>CHECKED BY</b> JWC	<b>DRAWING DATE</b> 08/28/2015	
<b>SCALE</b> 1" = 50'	<b>SHEET</b> 1 OF 1	SURVEYED BY JAMES W. CAUDILL LS2259 2999 PERKINS/MADDEN ROAD AMBURGEY, KY 41773 PHONE 806-642-3217

NAME \_\_\_\_\_ PLS# \_\_\_\_\_ DATE \_\_\_\_\_

LINE	BEARING	DISTANCE
L1	N 21°19'37" W	94.52
L2	N 24°57'26" W	76.13
L3	N 31°11'27" W	82.74
L4	N 38°43'42" W	90.19
L5	N 46°46'13" W	42.40
L6	N 68°34'30" W	76.13
L7	S 24°57'50" E	76.16
L8	S 46°46'09" E	42.43
L9	S 60°22'33" E	53.60
L10	S 66°34'08" E	65.57
L11	S 74°44'47" E	71.47
L12	S 83°10'13" E	46.27
L13	S 85°07'01" E	59.74

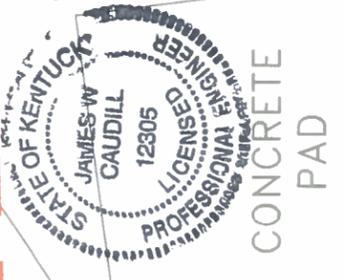


-THE PROPOSED TOWER HAS BEEN LOCATED USING DUAL FREQUENCY GPS UNIT PROCESSED BY "OPUS"  
 -STATE PLANE COORDINATES NAD 83 KY SINGLE ZONE N:3463736.36 E:5647702.78 EL:1350.48 EXISTING GR PLAN- FOUNDATION EL1352.0'-TOP TOWER EL 1652.0'  
 -PRECISION: HORIZONTAL=0.30' VERTICAL=0.50'  
 -THIS SURVEY MEETS OBSTACLE ACCURACY CODE 2C.  
 -PROPERTY LINE INFORMATION TAKEN FROM DEEDS AND VERIFIED IN THE FIELD.

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECTION.

James W. Caudill 12305 12-21-15  
 JAMES W. CAUDILL PE# DATE

PROPOSED SITE PLAN AND STRUCTURE LOCATION LENARUE TOWER APPALACHIAN WIRELESS			
DRAWN JWC	DATE 12/21/15	LENARUE TOWER C.O.A.P. LENARUE, KY HARLAN COUNTY	
APPROVED	DATE	SHEET 2 OF 3	PROJECT NO. LENARUE/LESITE20
SCALE 1" = 20'			



LARRY G. & DEBRA ANN HUBBS  
 BOOK 436 PAGE 545  
 NAD83 KY SINGLE ZONE

LAT:36°48'32.7775"  
 LON:83°16'06.6443"  
 N:3463736.36  
 E:5647702.78  
 Z:1350.48

LOT 1A  
 10000 Sq. Feet  
 0.23 Acres

COAP, INC  
 PROPERTY  
 BOOK 338 PAGE 33

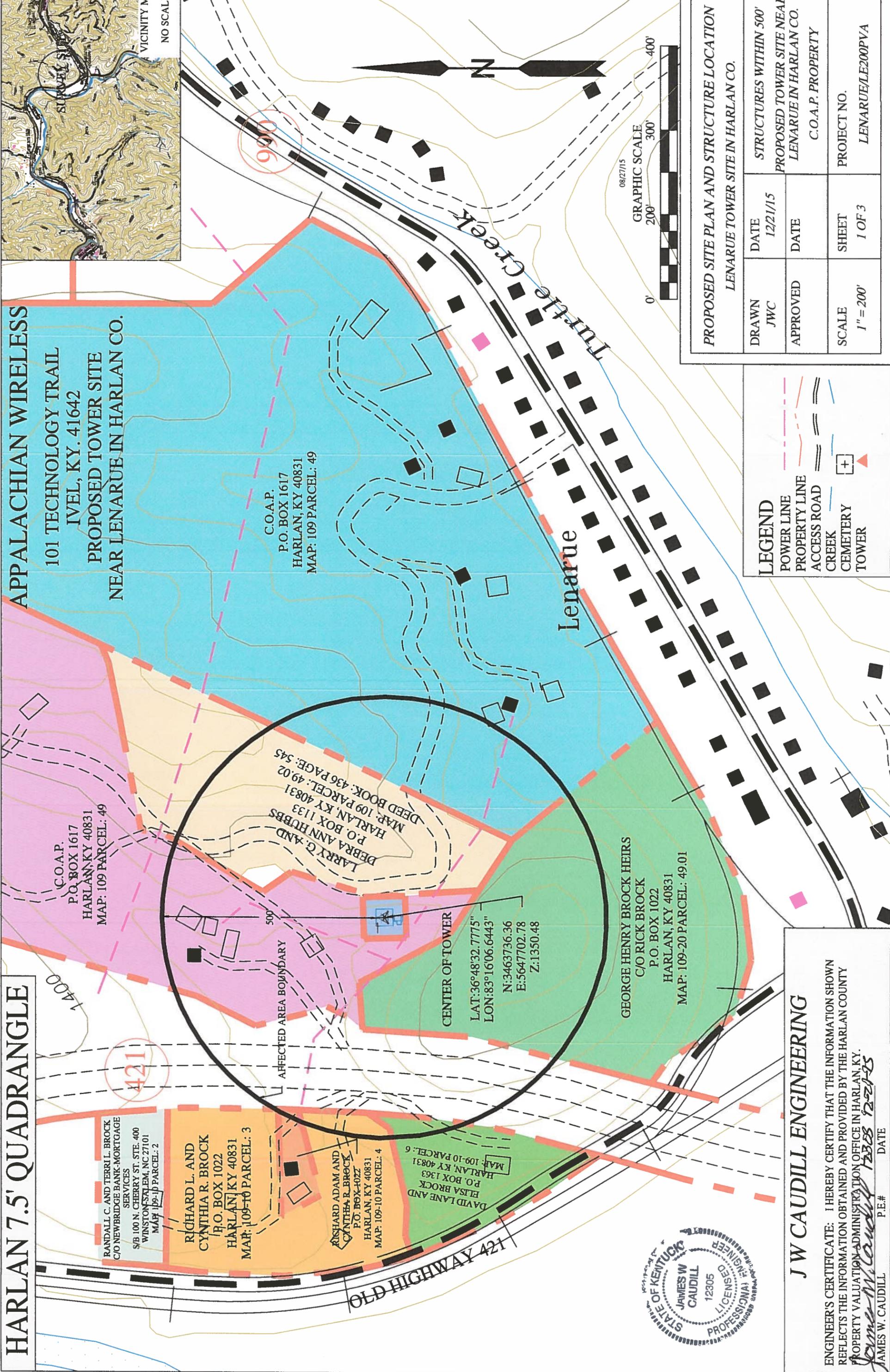
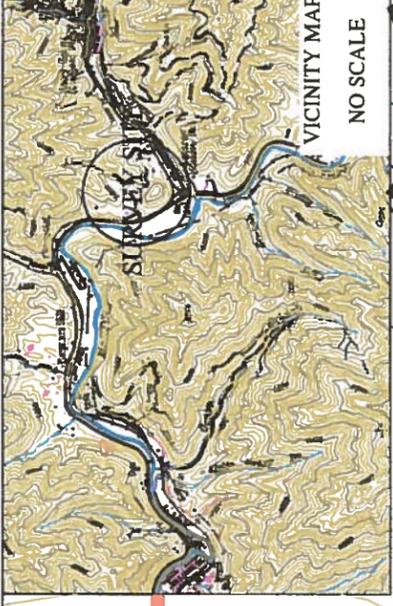
COAP, INC  
 PROPERTY  
 BOOK 338 PAGE 33

REID P. & FAYE BROCK  
 PROPERTY  
 BOOK 136 PAGE 470

- SURVEY STA  
 IRON PIN WITH CAP (18" x .5" REBAR PLASTIC CAP MARKED L52259)
- BOUNDARY LINE
- ACCESS ROAD
- PARENT TR LINE
- FOUND

# HARLAN 7.5' QUADRANGLE

APPALACHIAN WIRELESS  
101 TECHNOLOGY TRAIL  
IVEL, KY. 41642  
PROPOSED TOWER SITE  
NEAR LENARUE IN HARLAN CO.



421

RANDALL C. AND TERRIL BROCK  
C/O NEWBRIDGE BANK-MORTGAGE  
SERVICES  
S/B 100 N. CHERRY ST. STE. 400  
WINSTON-SALEM, NC 27101  
MAP 109-10 PARCEL: 2

RICHARD L. AND  
CYNTHIA R. BROCK  
P.O. BOX 1022  
HARLAN, KY 40831  
MAP: 109-10 PARCEL: 3

RICHARD ADAM AND  
CYNTHIA R. BROCK  
P.O. BOX 402Z  
HARLAN, KY 40831  
MAP: 109-10 PARCEL: 4

DAVID LANE AND  
ELSA BROCK  
P.O. BOX 1363  
HARLAN, KY 40831  
MAP: 109-10 PARCEL: 6

LARRY G. AND  
DEBRA ANN HUBBS  
P.O. BOX 1133  
HARLAN, KY 40831  
MAP: 109 PARCEL: 49.02  
DEED BOOK: 436 PAGE: 545

C.O.A.P.  
P.O. BOX 1617  
HARLAN, KY 40831  
MAP: 109 PARCEL: 49

C.O.A.P.  
P.O. BOX 1617  
HARLAN, KY 40831  
MAP: 109 PARCEL: 49

GEORGE HENRY BROCK HEIRS  
C/O RICK BROCK  
P.O. BOX 1022  
HARLAN, KY 40831  
MAP: 109-20 PARCEL: 49.01

CENTER OF TOWER  
LAT: 36°48'32.7775"  
LON: 83°16'06.6443"  
N: 3463736.36  
E: 5647702.78  
Z: 1350.48



## J W CAUDILL ENGINEERING

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

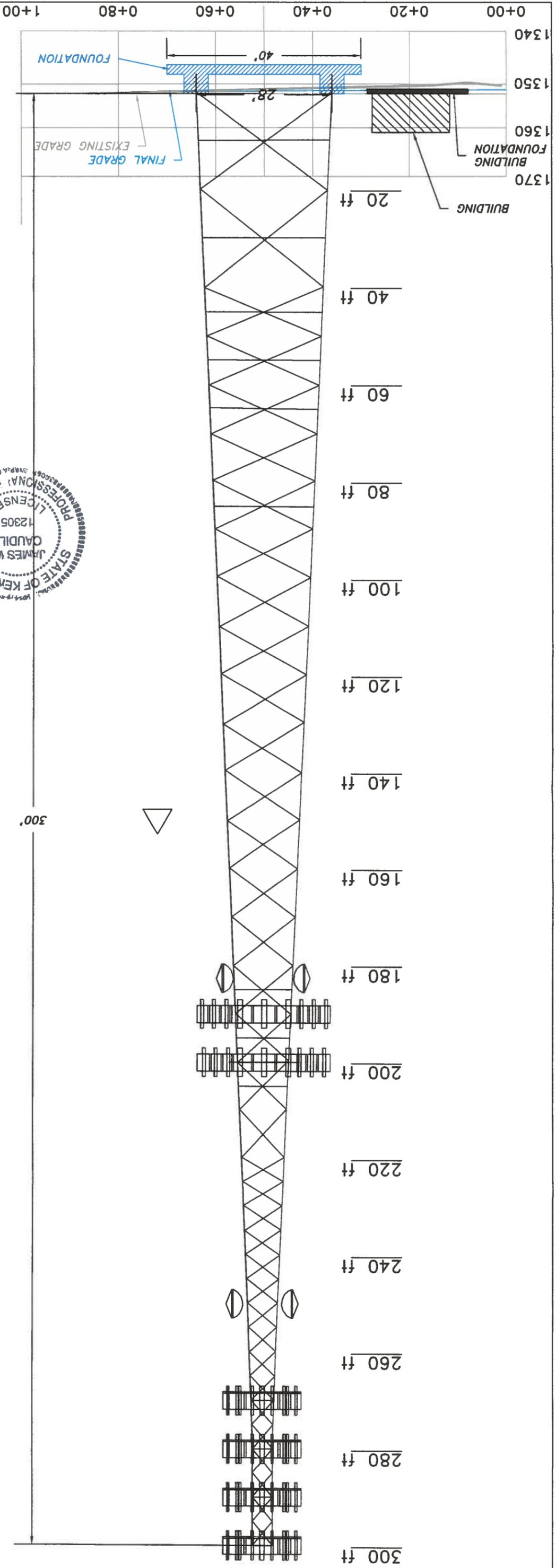
James W. Caudill 12305 12-31-25  
JAMES W. CAUDILL P.E.# DATE

**LEGEND**

- POWER LINE
- PROPERTY LINE
- ACCESS ROAD
- CREEK
- CEMETERY
- TOWER

**PROPOSED SITE PLAN AND STRUCTURE LOCATION**  
LENARUE TOWER SITE IN HARLAN CO.

DRAWN JWC	DATE 12/21/15	STRUCTURES WITHIN 500' PROPOSED TOWER SITE NEAR LENARUE IN HARLAN CO.
APPROVED	DATE	C.O.A.P. PROPERTY
SCALE 1" = 200'	SHEET 1 OF 3	PROJECT NO. LENARUE/LE200PVA



APPALACHIAN WIRELESS  
 101 TECHNOLOGY TRAIL  
 IVEL, KY. 41642  
 PROPOSED TOWER SITE  
 NEAR LENARUE IN HARLAN COUNTY

# PROFILE WITH TOWER

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  
 PE # 12305  
 DATE 12-21-15

NOTE: SEE FOUNDATION DRAWINGS FOR DETAILS

12/21/15  
 SCALE 1" = 20'



PROPOSED SITE PLAN AND STRUCTURE LOCATION LENARUE TOWER APPALACHIAN WIRELESS		SCALE 1" = 20'	SHEET 3 OF 3	PROJECT NO. LENARUE/LEPRO20
DATE 12/21/15	DATE 12/21/15	JWC	APPROVED	LENARUE TOWER C.O.A.P. PROPERTY OFF HWY 421 NEAR LENARUE IN HARLAN CO.