

**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. 2020-00333
NECESSITY TO CONSTRUCT A REPLACEMENT)
TOWER IN FLOYD COUNTY, KENTUCKY.)

East Kentucky Network, LLC d/b/a Appalachian Wireless, was granted authorization to provide cellular service in the KY-9 Cellular Market Area (CMA451) 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 No. 2001-022. East Kentucky Network, LLC is a Kentucky Limited Liability Company that was organized on June 16, 1998. East Kentucky Network, LLC is in good standing with the state of Kentucky.

In an effort to improve service in Floyd County, pursuant to KRS 278.020 Subsection 1 and 807 KAR 5:001, East Kentucky Network, LLC is seeking the Commission's approval to construct a 240 foot monopole tower on a tract of land located at 915 Boldman Tower Road, Harold, Floyd County, Kentucky (37°31'13.89"N 82°37'40.81"W). A map and detailed directions to the site can be found in Exhibit 7.

Exhibit 2 is a list of all Property owners according to the Property Valuation Administrator's record who own property within 500 feet of the proposed tower and all property owners who own property contiguous to the property upon which construction is proposed in accordance with the Property Valuation Administrator's record.

Pursuant to 807 KAR 5:063 Section 1(1)(l), Section 1(m) and Section 2 all affected property owners according to the Property Valuation Administrator's record who own property

within 500 feet of the proposed Tower or contiguous to the property upon which construction is proposed were notified by certified mail return receipt requested of East Kentucky Network, LLC's proposed construction and informed of their right to intervene. They were given the docket number under which this application is filed. Enclosed in Exhibit 2 is a copy of that notification.

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

Notice of the location of the proposed construction was published in the The Floyd County Chronicle & Times, October 21, 2020, edition. Enclosed in Exhibit 3 is a copy of that notice. The Floyd County Chronicle & Times is the newspaper with the largest circulation in Floyd County.

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

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

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

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

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

Two notice signs meeting the requirements prescribed by 807 KAR 5:063, Section 1(2), measuring at least two (2) feet in height and four (4) feet in width and containing all required language in letters of required height, have been posted, one at a visible location on the proposed site and one on the nearest public road. The two signs were posted on October 19, 2020, 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 Amendment to Lease Agreement for the site location along with a lot description.

The proposed construction site is on a very rugged mountaintop in close proximity to the existing tower. There is an existing 240' tower owned by East Kentucky Network, LLC on the property which cannot meet the needs of East Kentucky Network, LLC and will be removed upon construction of the proposed tower.

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

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

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

[THE REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK.]

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

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

SUBMITTED BY: *Lynn Haney* DATE: 10/20/2020
Lynn Haney, Regulatory Compliance Director

APPROVED BY: *W.A. Gillum* DATE: 10/20/2020
W.A. Gillum, General Manager

ATTORNEY: *Krystal Branham* DATE: 10/20/2020
Hon. Krystal Branham, Attorney

CONTACT INFORMATION:

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

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

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

Mailing Address:

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

1	FCC License
2	Copies of Cell Site Notice to Land Owners
3	Notifications of County Judge Executive and Newspaper
4	Universal Soil Bearing Analysis
5	Tower Design
6	FAA and KAZC Determination
7	Driving Directions from County Court House and Map to Suitable Scale
8	Memo of Amendment to Lease for Proposed Site with Legal Description
9	Survey of Site Signed/Sealed by Professional Engineer Registered in State of Kentucky
10	Site Survey Map with Property Owners Identified in Accordance with PVA of County
11	Vertical Profile Sketch of Proposed Tower
12	List of Competitors
13	Qualifications
14	
15	

Exhibit 1

ULS License

Cellular License - KNKN880 - East Kentucky Network, LLC d/b/a Appalachian Wireless

Call Sign	KNKN880	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA451 - Kentucky 9 - Elliott	Channel Block	B
Submarket	0	Phase	2

Dates

Grant	08/30/2011	Expiration	10/01/2021
Effective	09/04/2014	Cancellation	

Five Year Buildout Date

10/23/1996

Control Points

1 U.S. 23, HAROLD, KY

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

Contact

Lukas, Nace, Gutierrez & Sachs, LLP	P:(703)584-8665
Pamela L Gist Esq	F:(703)584-8696
8300 Greensboro Drive	E:pgist@fcclaw.com
McLean, VA 22102	

Ownership and Qualifications

Radio Service Type	Mobile
Regulatory Status	Common Carrier Interconnected Yes

Alien Ownership

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

Basic Qualifications

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

Demographics

Race

Ethnicity

Gender

Exhibit 2

EXHIBIT 2 – LIST OF PROPERTY OWNERS

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

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

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

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

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

LIST OF PROPERTY OWNERS

Paul R. and Elaine W. Gearheart
C/O Susan Gearheart Schmoltd
P.O. Box 151
Harold, KY 41635

Paul D. and Linda Gearheart
P.O. Box 401
Harold, KY 41635

Ned H. and Lucille R. Bush
C/O Ned Hagan Bush II
42 James Street
Pikeville, KY 41501

Boldman Replacement

Location:

915 Boldman Tower Road
Harold, KY 41635

Coordinates:

37° 31' 13.89" N
82° 37' 40.81" W



Google Earth

© 2020 Google

4000 ft

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

October 20, 2020

Paul R. and Elaine W. Gearheart
C/O Susan Gearheart Schmoltdt
P.O. Box 151
Harold, KY 41635

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2020-00333)

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 Floyd County. The facility will include a 240-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land at 915 Boldman Tower Road, Harold, Floyd County. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2020-00333 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, CPA
Regulatory Compliance Director
Enclosure 1

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

October 20, 2020

Paul D. and Linda Gearheart
P.O. Box 401
Harold, KY 41635

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Sincerely,



Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

October 20, 2020

Ned H. and Lucille R. Bush
C/O Ned Hagan Bush II
42 James Street
Pikeville, KY 41501

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2020-00333)

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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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Sincerely,



Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

Exhibit 3

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

EAST KENTUCKY
NETWORK



To: The Floyd County Chronicle and Times **From:** Raina Helton
Attn: Classifieds Regulatory Compliance Assistant

Email: classads@news-expressky.com **Date:** October 19, 2020

Re: PUBLIC NOTICE ADVERTISEMENT **Pages:** 1

Please place the following Public Notice Advertisement in The Floyd County Chronicle Times to be ran on October 21, 2020.

PUBLIC NOTICE:

RE: Public Service Commission of Kentucky (CASE NO. 2020-00333)

Public Notice is hereby given that East Kentucky Network, LLC, dba Appalachian Wireless has applied to the Kentucky Public Service Commission to construct a replacement cellular telecommunications tower on a tract of land located at 915 Boldman Tower Road, Harold, Floyd County, Kentucky. The proposed tower will be a 240 foot monopole tower with attached antennas. If you would like to respond to this notice, please contact the Executive Director, Public Service Commission, 211 Sower Boulevard, PO Box 615, Frankfort, Kentucky 40602. Please refer to Case No. 2020-00333.

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

Thank you,

Raina Helton
Regulatory Compliance Paralegal

The message above and the information contained in the documents transmitted are confidential and intended only for the person(s) named above. Dissemination, distribution or copying of this communication by anyone other than the person(s) named above is prohibited. If you have received this communication in error, please notify us immediately by telephone and return the original message to us at the address listed above via regular mail. Thank you.

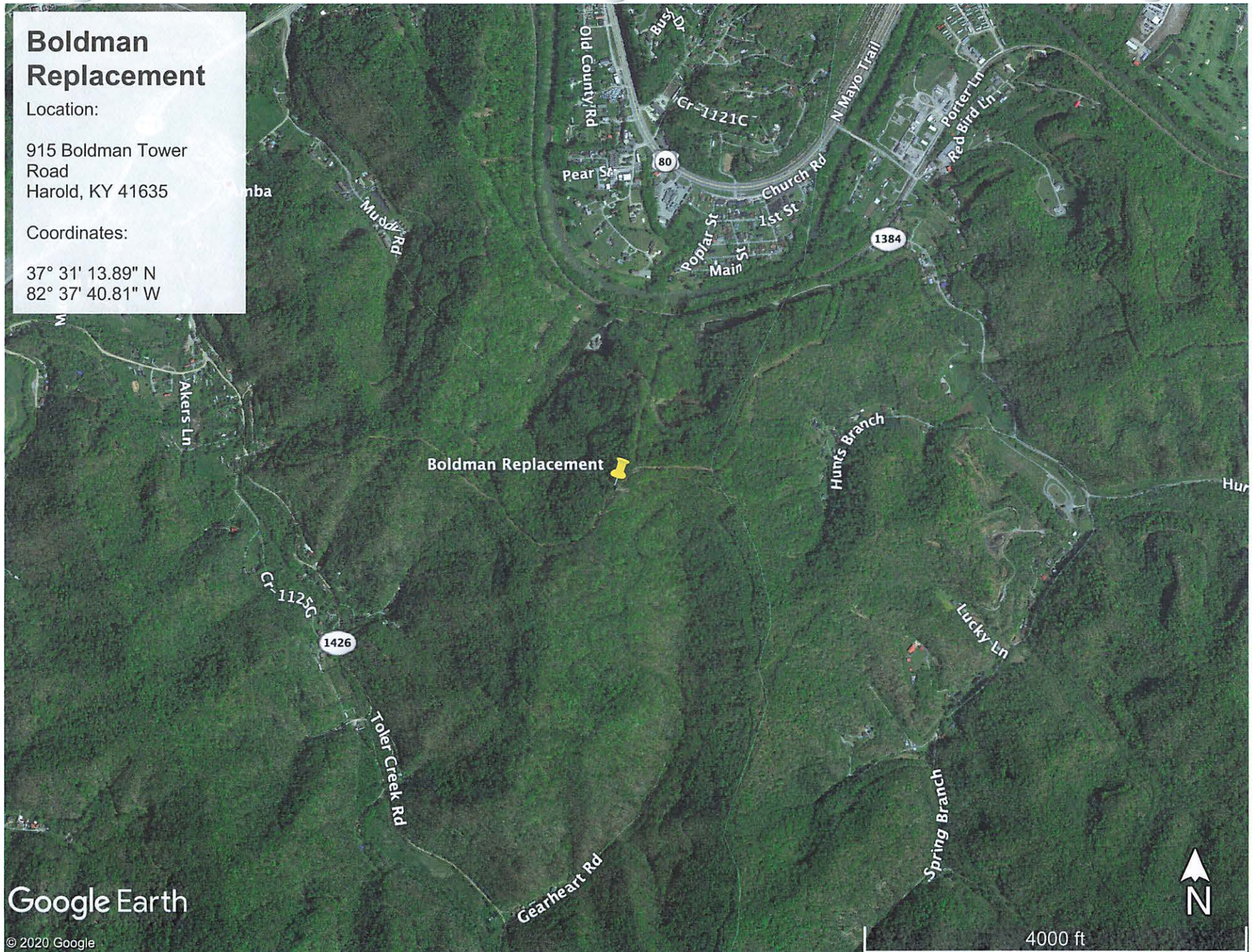
Boldman Replacement

Location:

915 Boldman Tower Road
Harold, KY 41635

Coordinates:

37° 31' 13.89" N
82° 37' 40.81" W



Google Earth

© 2020 Google

4000 ft

VIA: U.S. CERTIFIED MAIL

October 19, 2020

Robert Williams, Judge Executive
149 S Central Ave.
Prestonsburg, KY 41653

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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. 2020-00333 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, CPA
Regulatory Compliance Director
Enclosure

Exhibit 4



230 Swartz Drive • Hazard • Kentucky • 41701

Phone (606) 551-1050

EAST KENTUCKY ENGINEERING, LLC.

**APPALACHIAN WIRELESS
Geotechnical Investigation on the
Boldman Tower Site
Floyd County, Kentucky
EKYENG Project No. 165-000-0094**

PREPARED FOR:

Appalachian Wireless.
101 Technology Trail
Ivel, Kentucky 41642

PREPARED BY:

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



_____, 20215, July 17th, 2020



EAST KENTUCKY ENGINEERING, LLC.

EXECUTIVE SUMMARY

1.0 INTRODUCTION

2.0 PROJECT DESCRIPTION

3.0 SITE DESCRIPTION & HISTORICAL MINING

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3.2 SURFACE MINING

3.3 UNDERGROUND MINING

3.4 FLOOD HAZARD

4.0 FIELD EXPLORATION

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II – ENGINEERED FILL BENEATH STRUCTURES CLEARING AND GRADING SPECIFICATIONS

III – GUIDELINES FOR EXCAVATIONS AND TRENCHING

IV – DRILLED PIER INSTALLATION

V – GENERAL CONCRETE SPECIFICATIONS

APPENDIX A – BORING LOGS

APPENDIX B – CORE PHOTOGRAPHS

APPENDIX C – SEISMIC DATA

APPENDIX D – PHOTOGRAPHS

APPENDIX E – MAPS



EAST KENTUCKY ENGINEERING, LLC.

EXECUTIVE SUMMARY

A geotechnical investigation has been performed on the Boldman Tower Site, located in Floyd County, Kentucky. This site is readily accessible. A location map is shown in Figure 1 of this report. One (1) boring was advanced to a maximum depth of 46.0 ft. The following geotechnical considerations were identified:

- The boring utilized for this study encountered sandstone to a depth of 33.5' and extended to a total depth of 46.0'.
- The estimated maximum base elevation of the tower is to be 15 to 26 ft in depth within the sandstone unit.
- This site is on a ridgeline, next to an existing tower, in Boldman, KY.
- **The allowable bearing capacities are estimated at 4 tsf on this weathered sandstone unit from 1440' to 1420'.**
- The 2015 International Building Code seismic site classification for this site is "A."
- If, during the foundation design, it becomes necessary to lower or raise the footer, alternate design recommendations can be provided by EKYENG.
- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We, therefore, recommend that EKYENG is retained to monitor this portion of the work.

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



EAST KENTUCKY ENGINEERING, LLC.

1. INTRODUCTION

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

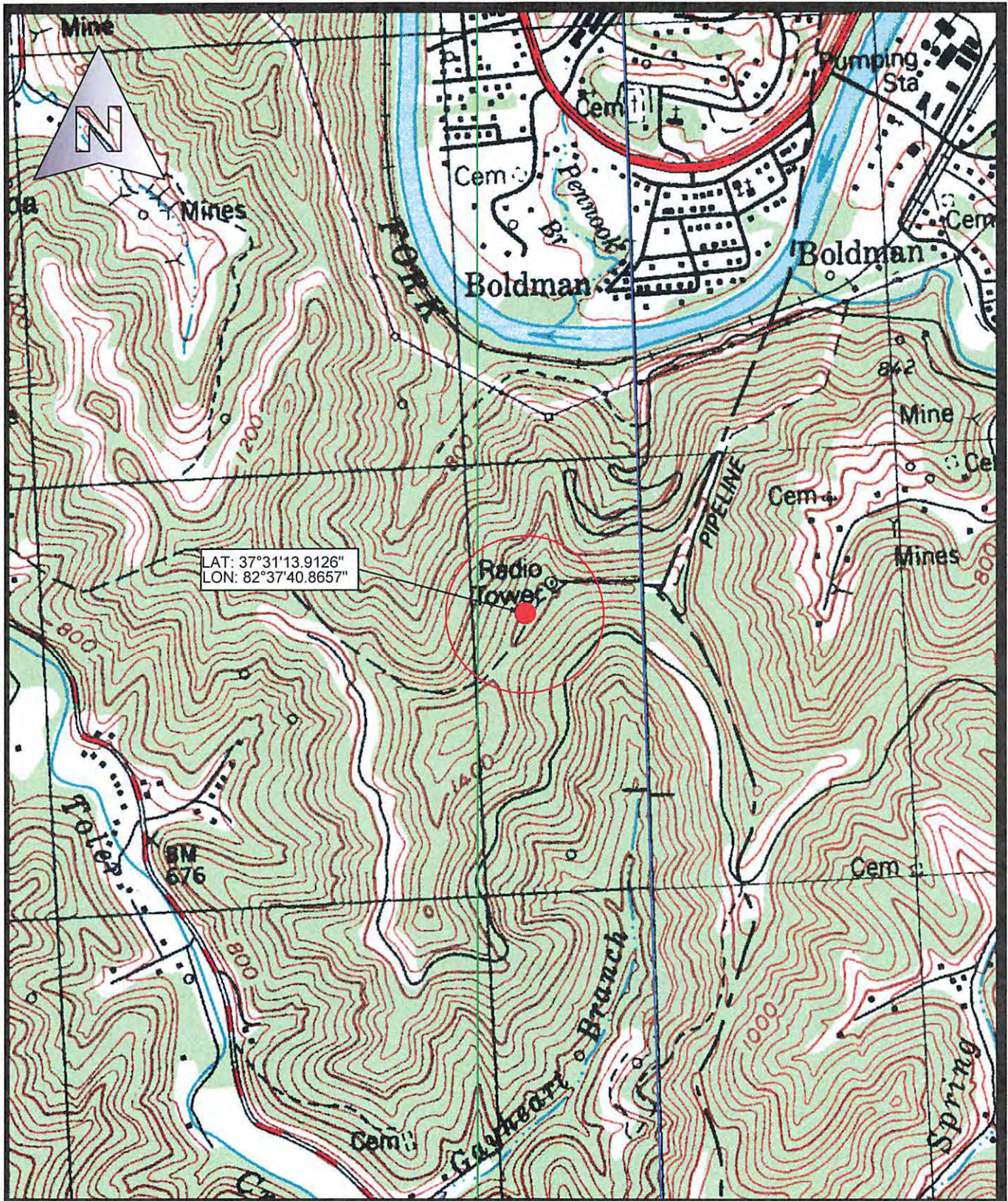
One (1) boring was advanced to a maximum depth of 46.0 ft. Horn and Associates, Inc. provided drilling services to obtain this boring. Logs of the boring along with a boring location plan are included in Appendix A and Appendix D. The purpose of these services is to provide information and geotechnical engineering recommendations about subsurface conditions, earthwork, seismic considerations, groundwater conditions, and foundation design.

2.0 PROJECT DESCRIPTION

The proposed communication facility will consist of a self-supporting tower of undetermined height and ancillary support areas. The footing area is estimated to be a 9 ft diameter circular pier, with an estimated base of the tower footer elevation at 1445'. Based on the information provided, we estimate the structural loads will be like the following conditions;

CONDITION	LOAD
Total Shear	40 Kips
Axial Load	50 Kips

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



Drawn: RDS	8/7/2020
Job: 165-094	Scale: 1"=1000'

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

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



EAST KENTUCKY ENGINEERING, LLC.

3.0 SITE DESCRIPTION & HISTORICAL MINING

3.1 GENERAL INFORMATION

The site location is on a ridgeline, adjacent to an existing tower, in Floyd County, Kentucky. The current surface elevation is approximately 1445 ft. The research on historical mining was conducted by obtaining previous mine license maps from the "Kentucky Mine Mappings Information System" (KMMIS).

3.2 SURFACE MINING

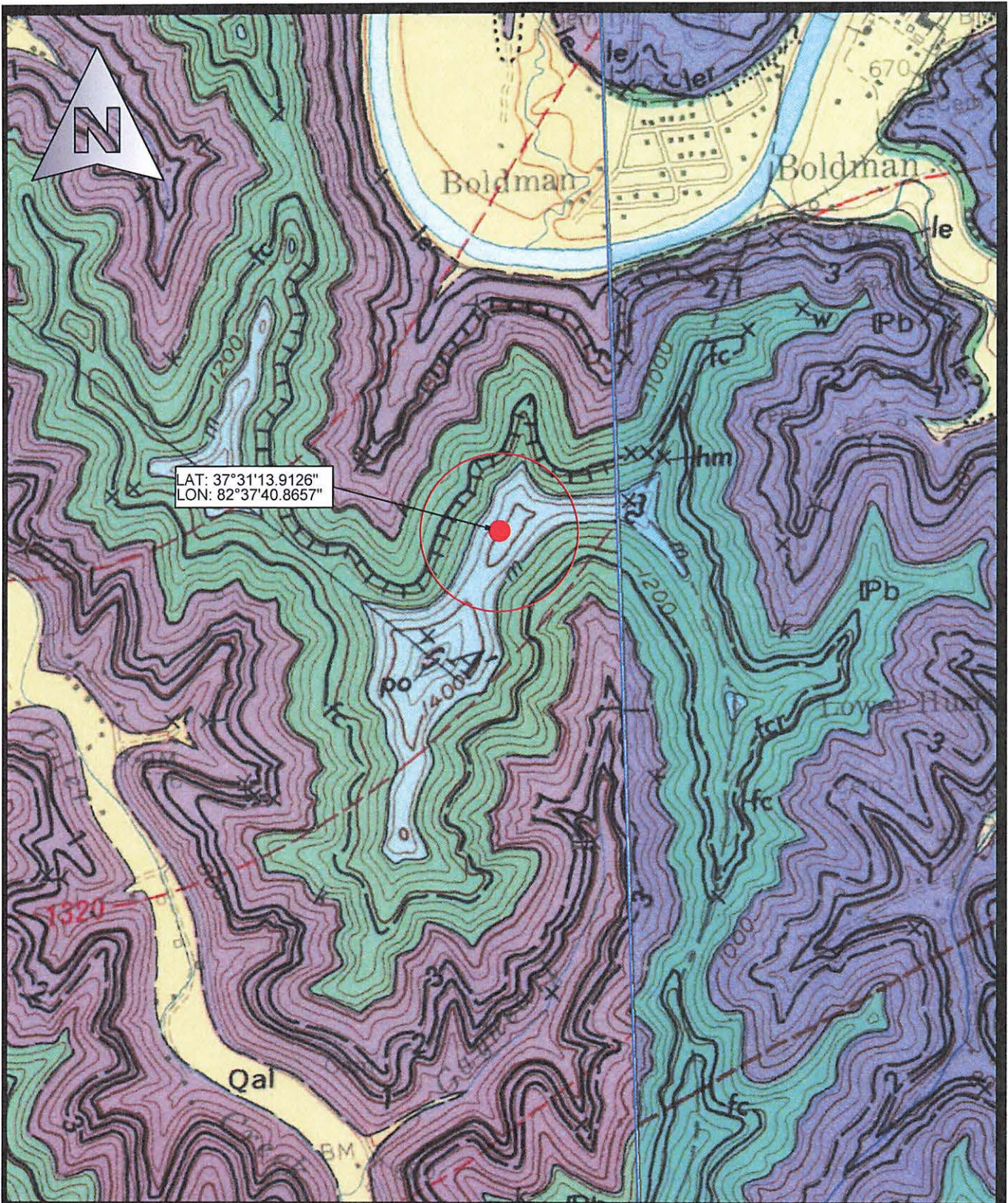
Surface mining has been conducted near the proposed tower location in the Elkhorn No. 2 Seam and the Elkhorn No. 4 & 5 Seams by Cedar Mining Company. These Elkhorn 4 & 5 Seams have also been represented as the Fireclay Seams. These seams were surface and auger mined north of the site. The Fireclay Seam was mined by Lower Hurricane Creek Mining. The review of mine maps does not show mining in any areas that would influence this proposed tower. Excerpts from these maps are included in the Maps Appendix section of this report.

3.3 UNDERGROUND MINING

Our research found underground mine workings beneath the tower site in the Elkhorn No. 1 Seam, Elkhorn No. 4 Seam which has also been shown as the Fire Clay Coal Seam on the map found in our research.

The Elkhorn No. 1 Seam was mined in the 1950s. Mining was conducted approximately 700 ft beneath the tower site by the Harold Fuel Company. The coal thickness is estimated to be approximately 60 inches thick. An Excerpt from the mine map is included in the appendices.

The Elkhorn No. 4 Seam was mined in the 1980s. Room and pillar mining was conducted approximately 220 ft below the tower site. The mining opening is estimated to be approximately 60 inches thick. No secondary mining was shown



Drawn: RDS	8/7/2020
Job: 165-0094	Scale: 1"=1000'

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

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



EAST KENTUCKY ENGINEERING, LLC.

on the maps found during our research. Two maps were found demonstrating this mining. One was the Lower Hurricane Creek Mining Company and the other was Express Coal Company. Excerpts from these maps are in Maps Appendix of this report.

These underground openings pose some potential subsidence due to the proximity to the tower site. A visual inspection of the surface features was conducted as part of the site investigation and no evidence was noted. Since two adjacent towers have been located on this site and no issues have been reported, we do not expect issues from subsidence on the proposed tower at this location.

3.4 FLOOD HAZARD

A flood determination was conducted by EKYENG. For this determination, the FEMA Flood Map Service was reviewed for this location. The flood map for the selected area is number **21071C0220E-210069**. The flood zone for this area is Zone X and is an area of minimal flood hazard. A FIRMette map is included in Appendix C of this report.

4.0 FIELD EXPLORATION

4.1 SITE INFORMATION

The proposed site is located on a ridgeline in Boldman, KY, next to an existing tower, in Floyd County, Kentucky. The site lies within the Harold Quadrangle. The site is readily accessible by conventional exploratory equipment. An estimated pad location was determined based on the information provided. Foundation dimensions were estimated to be a 9 ft in diameter circular pier footer for this report.



EAST KENTUCKY ENGINEERING, LLC.

4.2 BORING DATA

One (1) boring was made in the relative position shown on the Site Map in Appendix D. The boring logs and resulting data are included in Appendix A. This boring was made with a track-mounted boring rig using hollow-stem augers and employing standard penetration resistance methods (ASTM D-1586, which includes 140-pound hammer, 30-inch drop, and two-inch-O.D. split-spoon sampler) at maximum depth intervals of five feet or at major changes in stratum, whichever occurred first. There were no split spoon samples taken at this site.

The position at which the core was taken is indicated on the boring logs and shown on the sitemap in Appendix D. The corresponding Blow counts are shown in Table No. 2.

TABLE NO. 2
STANDARD PENETRATIONS

SAMPLE NO.	DEPTH INCREMENT	BLOW COUNT / RQD *	DESCRIPTION
B-1 S-1	0.0-1.1	--	Brown Clay Silt with Sand
B-1 S-2	1.1-2.0	--	Weathered Sandstone
B-1 S-3	2.0-33.5	10*	Brown Weathered Sandstone with Clay and Shale
B-1 S-4	33.5-34.6	24	Gray Shale
B-1 S-5	34.6-34.8	---	Coal
B-1 S-6	34.8-38.8	24	Gray Shale
B-1 S-7	38.8-39.0	---	Coal
B-1 S-8	39.0-40.3	42	Gray Shale
B-1 S-9	40.3-41.5	42	Gray Sandy Shale
B-1 S-10	41.5-43.3	44	Gray Sandstone
B-1 S-11	43.5-46.0	44	Gray Shale



EAST KENTUCKY ENGINEERING, LLC.

The boring encountered weathered sandstone to a depth of 33.5' ft. This formation is of poor quality based upon the Rock Quality Designation (RQD). This can be attributed to a narrow ridgeline and stress relief fractures that are commonly called hill seams. The boring was extended by "NX" size rock core that was taken to confirm the presence of rock at the site and to determine its physical characteristics. The core was made with "NX" size diamond coring equipment. This boring is between 2.0 ft. and 46.0 ft in depth and consisted of brown weathered sandstone. The position at which the core was taken is indicated on the boring logs and shown on the boring location map in Appendix D.

4.3 GROUNDWATER

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

4.4 SEISMIC SITE CLASSIFICATION

Based on the encountered soil conditions at the project site, the site classification was determined to be "Site Class A" per the 2015 Kentucky Building Code. In addition, an S_{D5} coefficient of 0.042 g was calculated, and an S_{D1} coefficient of 0.145 g was also calculated for design based on the aforementioned building code.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 GENERAL

The structure will be a self-supporting free-standing monopole tower. Due to wind loading, lattice tower foundations can experience both vertical loads and



EAST KENTUCKY ENGINEERING, LLC.

horizontal loads. The vertical loads act in both an upward and downward direction as the tower attempts to overturn and can act in any directions.

5.2 DRILLED PIER FOUNDATION RECOMMENDATIONS

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

TABLE NO. 3

Approx. Depth (ft.)	Allowable Skin Friction (psf.)	Allowable End Bearing Pressure (psf.)	Effective Unit Weight (pcf.)	Cohesion (psf.)	Internal Angle of Friction (Degrees)
Topsoil's 0 – 2.0	Ignore	Ignore	Ignore	Ignore	Ignore
Sandstone Weathered 2.0 -33.5	800	8,000	150	----	27

Note: Strata below is not recommended due to small coal seams at 34.8' & 39.0'. If additional information below these seams is needed it can be provided.

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

5.3 BURIED UTILITIES

Excavations for buried utility pipelines should follow the guidelines set forth in this report. Depending on the pipeline material, a minimum thickness of at least 0.5



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

6.0 WARRANTY

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

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

6.1 SUBSURFACE EXPLORATION

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



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The boring log includes sampling information, description of the materials recovered, approximate depth of boundaries between soil and rock strata and groundwater data. The boring log represents conditions specifically at the location and time the boring was made. The boundaries between different soil strata are indicated at specific depths; however, these depths are in fact approximate and are somewhat dependent upon the frequency of sampling (The transition between soil strata is often gradual). Free groundwater level readings are made at the times and under conditions stated on the boring logs (Groundwater levels change with time and season). The borehole does not always remain open sufficiently long enough for the measured water level to coincide with the groundwater table.

6.2 LABORATORY AND FIELD TESTS

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

6.3 ANALYSIS AND RECOMMENDATIONS

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

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

The geotechnical engineering report states our understanding as to the location, dimensions and structural features proposed for the site. Any significant changes



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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.



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This report has been prepared for the exclusive use of Appalachian Wireless, for specific application to the proposed cellular tower located on the Boldman Property located in Floyd County, Kentucky. Specific design and construction recommendations have been provided in the various sections of the report. The report shall, therefore, be used in its entirety. This report is not a bidding document and shall not be used for that purpose. Anyone reviewing this report must interpret and draw their conclusions regarding specific construction techniques and methods that were chosen. EKYENG is not responsible for the independent conclusions, opinions, or recommendations made by others based on the field exploratory and laboratory test data presented in this report.



SPECIFICATIONS

I – GENERAL

1.0 STANDARDS AND DEFINITIONS

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

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

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

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

1.2 DEFINITIONS

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

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

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

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

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

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



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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.



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II - ENGINEERED FILL BENEATH STRUCTURES CLEARING AND GRADING SPECIFICATIONS

1.0 GENERAL CONDITIONS

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

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

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

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

2.0 SUBSURFACE CONDITIONS

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

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

3.0 SITE PREPARATION

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

All cut and fill areas shall be properly stripped. Topsoil will be removed to its full depth and stockpiled for use in finish grading. Any rubbish, organic and other objectionable soils, and other deleterious material shall be disposed of off the site,



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or as directed by the Owner or his designated representative if on site disposal is provided. In no case shall such objectionable material be allowed in or under the fill unless specifically authorized in writing.

Prior to the addition of fill, the original ground shall be compacted to job specifications as outlined below. Special notice shall be given to the proposed fill area now. If wet spots, spongy conditions, or groundwater seepage is found, corrective measures must be taken before the placement of fill.

4.0 FORMATION OF FILL AREAS

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

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

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

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

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



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

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

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

5.0 SLOPE RATIO AND STORM WATER RUN-OFF

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

6.0 GRADING

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

7.0 COMPACTING

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

8.0 TESTING AND INSPECTION SERVICES

Testing and inspection services will be provided by the Owner.



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GUIDELINES FOR EXCAVATIONS AND TRENCHES

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

1. Check with the following utilities prior to breaking ground:
 - Sewer
 - Telephone
 - Fuel
 - Electric
 - Water
 - Gas
 - Cable

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

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

2. Access and egress ramps must be designed by a "competent person" and structural ramps used for equipment must be designed by a "competent person" with qualified knowledge in structural design. In addition:
 - Ramps must be secured to prevent displacement;
 - Ramps used in lieu of steps must have cleats to prevent slipping; and
 - Trenching excavations four feet or greater in depth must have a stairway, ladder, ramps or other safe means to egress with lateral travel no more than 25 feet.
3. Workers must be provided with reflector garments, such as warning orange or red vests, when exposed to vehicular traffic.
4. Contractors must not allow workers to work under or near equipment when there is danger of falling debris, spillage or equipment-related injuries.



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5. Mobile equipment, operating adjacent to an open excavation or approaching the edge of an excavation, must have one of the following when the operator's view is obstructed:
 - Warning System
 - Mechanical Signals
 - Barricades
 - Stop Logs
 - Hand Signals
6. The contractor must check the atmosphere for hazardous gases and oxygen deficiencies when excavating four feet or greater around landfills, or when hazardous substances are stored nearby, and when the contractor expects there could be any exposure to the workers.
7. When hazardous atmospheric conditions exist, or when conditions could change, the contractor must make emergency rescue equipment readily available including breathing apparatus, safety harnesses with life lines and a basket stretcher.
8. When workers enter bell-bottom pier holes or other deep and confined excavations, the worker must wear (always while performing work in the confined space) a separate life line attached to a harness. The line must be attended by someone above while work is being performed. The worker must check for hazardous atmospheric conditions prior to entry.
9. The contractor must ensure that water does not accumulate in open excavations and must inspect the excavation prior to allowing workers to re-enter after heavy rains.
10. Adjacent structures (buildings, walls, etc.) must be supported or secured to prevent worker exposure to unsafe conditions and damage to existing structures.
11. A registered professional engineer must approve operations when a contractor underpins existing structures to ensure worker safety and prevent damage to existing structures.
12. Workers must not be exposed to loose soil and rock or materials in and around excavations. Materials, such as removed soil and rock, must not be stored closer than two feet from the edge of the excavation.
13. Daily inspections of the excavation, the adjacent areas and protective systems must be made by a "competent person" for evidence of possible cave-ins, indications of failure of protective systems, hazardous



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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.



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IV - DRILLED PIER INSTALLATION

1.0 DRILLING PROCEDURE

- 1.1 Drilled piers will be installed with large caisson drill rigs capable of torque and crowd forces sufficient to install drilled piers at the project site given the in-situ soil conditions.
- 1.2 The drill rig kelly bar and auger will be carefully and accurately placed over the centerline of the drilled pier. The Contractor is responsible for providing necessary surveying to verify drilled pier location before, during, and after the drilled pier installation.
- 1.3 The augers are advanced downwards as they are rotated such that drilling of the soil mass is efficiently accomplished. Depending on the subsurface conditions, and the requirements for the given project, a temporary steel casing should be installed at this time to preclude caving of the soil and/or broken rock mass being penetrated.

2.0 CASING INSTALLATION

- 2.1 The casing will be checked for centerline accuracy and plumbness by the Contractor's survey crew. During casing installation, the 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



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"Sonotube" shall be inserted into the borehole to preclude cave-ins and/or instability in the borehole.

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

3.0 INSTALLATION OF THE REBAR CAGE

- 3.1** An epoxy coated spiral reinforcing steel cage will be installed while in the drilled pier borehole.
- 3.2** To assist in assuring that the reinforcing steel cage does not settle during concrete pumping, a mat of reinforcing steel bars will be installed across the bottom of the reinforcing steel cage perpendicular to the vertical axis of the cage. The exact number of bars will be determined and installed by the Structural Engineer. The number of rebar boots used on the bottom of the cage will also be determined by the Structural Engineer.
- 3.3** The reinforcing steel cage will be lowered into the drilled pier borehole, while drilled pier spacers are placed at intervals as required by the Structural Engineer. The reinforcing steel cage will be checked for alignment by the Contractors survey crew.
- 3.4** The crane will remain attached to the reinforcing steel cage while the concrete pump outlet pipe is lowered to just above the bottom of the drilled pier. The concrete pump pipe sections will be welded together to assure that do not separate during pumping.



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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.



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V - GENERAL CONCRETE SPECIFICATIONS

1.0 GENERAL

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

2.0 SCOPE

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

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

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

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

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

3.0 MATERIALS

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

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

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



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

2. Coarse Aggregate: Cement concrete shall consist of crushed rock or screened gravel and shall be composed essentially of clean, hard, strong and impermeable particles, resistant to wear and frost and free from deleterious amounts of organic matter, loam, clay, salts, mica, and soft, thin, elongated, laminated or disintegrated stone, and shall be inert to water and cement.
- B. Portland Cement: Portland cement shall conform to ASTM Specification C150. Type I or Type II Portland Cement shall be used provided that they are not intermixed during any one batch. Type II Portland Cement shall not be used unless indicated on the plans.
- C. Water: Water for mixing and curing shall be clean, fresh, and free from deleterious materials.
- D. Metal Reinforcement: Rebar shall be Grade 60 and with deformations conforming to ASTH Specification A305. Welded wire mesh shall conform to W4 x W4 size and be of Grade 60 steel.
- E. Admixtures: Except as herein noted, admixtures shall not be used.
 1. Under adverse weather conditions only retarding or accelerating agents containing no chloride may be used.
 2. Air-Entraining Agent shall be used for all concrete will give an entrained air range of not less than 4 percent but no greater than 8 percent in the finished product. Under no circumstances shall the air-entraining be interground with cement.
 3. Approval in writing shall be required from Owner prior to the use of any admixture.

4.0 FORM

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

5.0 INSERTS, ETC.

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



6.0 REINFORCEMENT

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

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

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

7.0 CONCRETE

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

8.0 DEPOSITING CONCRETE

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

1. Remove from space to be occupied by concrete all debris, including snow, ice, and water unless otherwise permitted by Owner.
2. Provide diversion, satisfactory to Owner, of any flow of water to an excavation to avoid washing the freshly deposited concrete.
3. 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



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aggregates. Each batch of concrete delivered at the job site shall be accompanied by a time slip issued at the batching plant, bearing the time of charging of the mixer drum with the cement and aggregates.

- C. Transporting of Concrete from Mixer to Place of Final Deposit: Transportation shall be done as rapidly as practical by means which shall prevent the separation or loss of the ingredients. If chutes are used, they shall be at a slope not flatter than one vertical to two horizontal. Buggies or carts shall be equipped with pneumatic rubber tires or surfaces of runways shall be sufficiently smooth or both so as not to cause separation or segregation of concrete ingredients. Concrete shall not be allowed to drop freely more than 4 feet. Where greater drops are required, canvas "elephant trunks" or galvanized iron chutes equipped with suitable hopper heads shall be employed and a sufficient number placed to ensure that the concrete may be effectively compacted into horizontal layers not exceeding 12 inches in thickness with minimum lateral movements.
- D. Depositing of Concrete: Depositing of concrete shall:
1. Proceed continuously after once starting until reaching the end of a section of construction joint location shown on the drawings, or as approved by the Owner. The operations shall be conducted so that no concrete is deposited on concrete sufficiently hardened to cause formation of seams, and planes of weakness.
 2. Be as near as practical to its final position in the forms.
 3. Proceed to maintain constantly a top surface which is approximately level.
 4. Be placed before initial set has occurred, and in no event after it has contained its water content for more than 90 minutes.
 5. Be thoroughly worked and compacted by means of suitable tools to provide impermeability, durability and strength and shall be thoroughly worked around reinforcements and embedded items and into corners of forms and to be free from voids, pockets or honeycombing. Care shall be taken to provide impermeability.
- E. Vibration Equipment: Vibration equipment shall be of the appropriate type and shall, always, be adequate in number of units and power of each unit to properly consolidate all concrete.



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

9.0 CURING

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

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

10.0 CONCRETE FINISHES

Finishes of all exposed concrete shall be free of defects which impair its durability or adversely affect 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.



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APPENDIX A BORING LOGS

Project Name <u>BOLDMAN TOWER</u>	Hole Number <u>B-1</u> Total Depth <u>46</u>
Federal Project No. _____	Location <u>AS DIRECTED</u>
State Project No. _____	Surface Elevation <u>N/A</u>
Drilling/Sampling Method _____	Date Started <u>7-16-20</u> Date Completed <u>7-16-2020</u>
Boring Diameter _____	Driller <u>GRANT</u> Weather _____

From To	Soil and Rock Description	Sample/Run Interval	Blow Counts/RQD	Sample/Run No.	Sample Type	% Recovery
0.0 1.1	BR CL SILT W/SAND	2.0-7.0	0.9 18%	1	NXB	4.2 84%
1.1 2.0	WEA SS	7.0-16.0	0.0 0	2		6.3 63
	A.R 2.0	16.0-26.0	2.5 10	3		7.6 76
2.0 33.5	BR SS (WEA) w/CLAY/SHALS	26.0-30.0	0.3 10	4		11 28
	SEAM 23.2-25.2	30.0-33.5	0.0 0	5		1.1 31
33.5 34.6	GR SHALE	33.5-36.0	0.5 24	6	N	2.1 84
34.6 34.8	COAL	36.0-41.0	2.1 42	7	V	4.2 84
34.8 38.8	GR SHALE	41.0-46.0	2.2 44	8		4.3 86
38.8 39.0	COAL					
39.0 40.3	GR SHALE					
40.3 41.5	GR SANDY SHALE					
41.5 43.3	GR SS					
43.3 46.0	GR SHALE					
	TERM 46.0'					
	LOST H2O 4.0'					
	RUNS 4, 5, 6 BLOCKED OFF					

Water Level @ Drilling _____	24 Hr. Water Level _____	7 Day Water Level _____
Moving/Delay Time _____	Hammer Weight <u>140 lbs.</u>	Hammer Drop <u>30 in.</u>

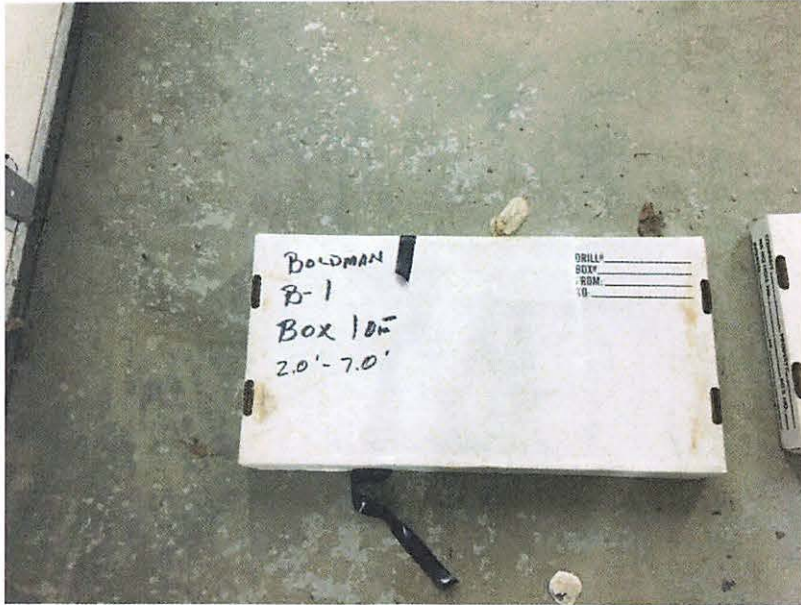


EAST KENTUCKY ENGINEERING, LLC.

APPENDIX B CORE PHOTOGRAPHS

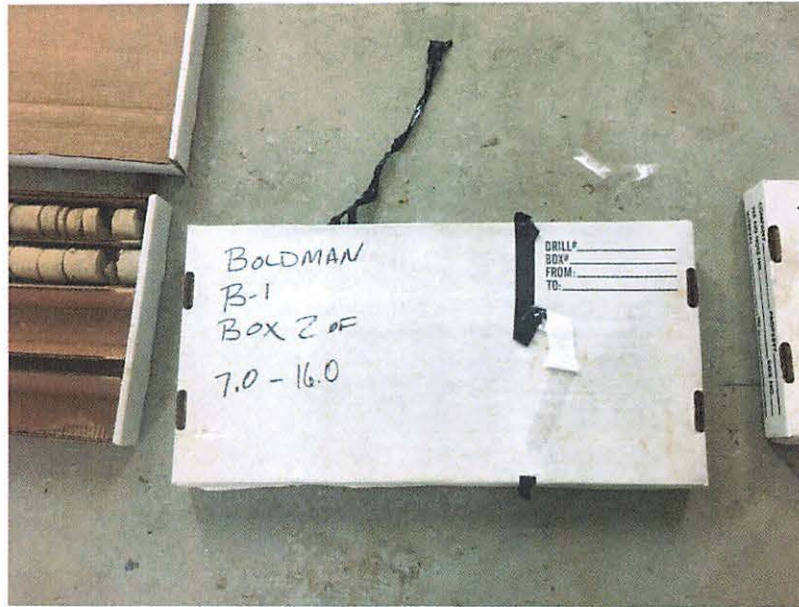


EAST KENTUCKY ENGINEERING, LLC.



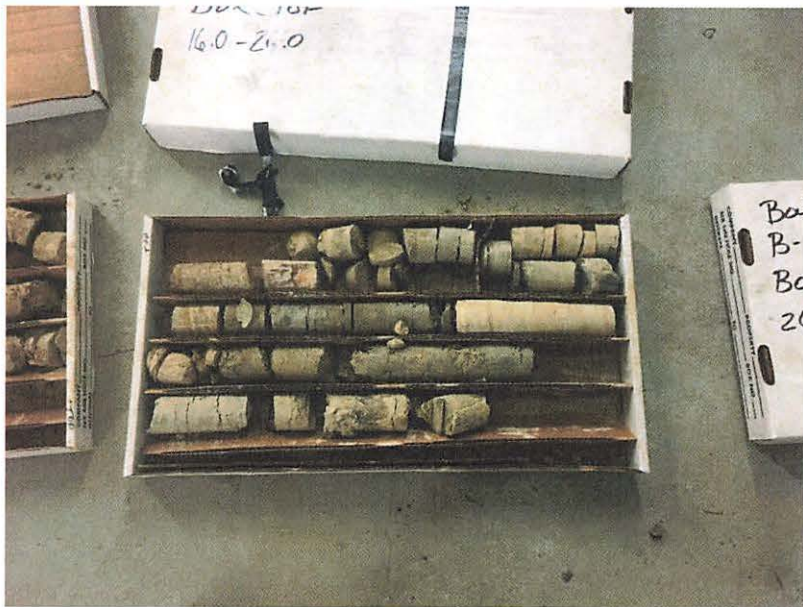
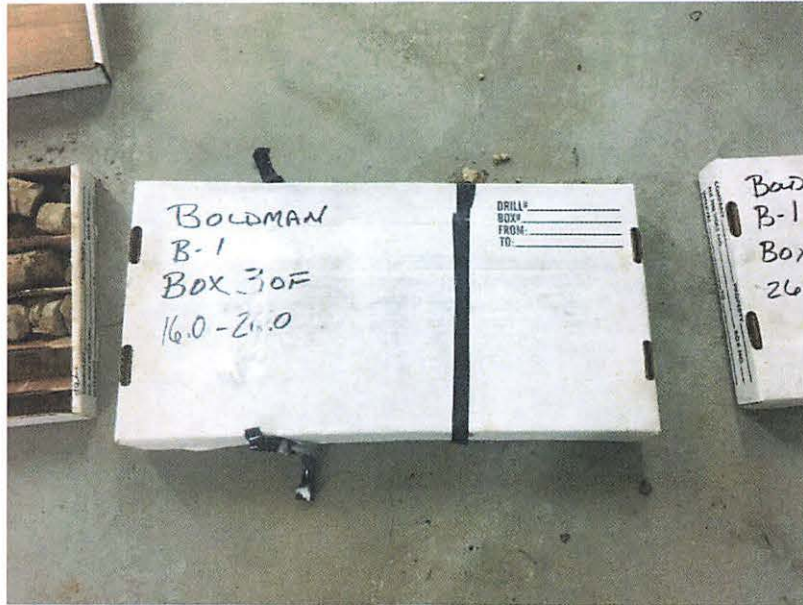


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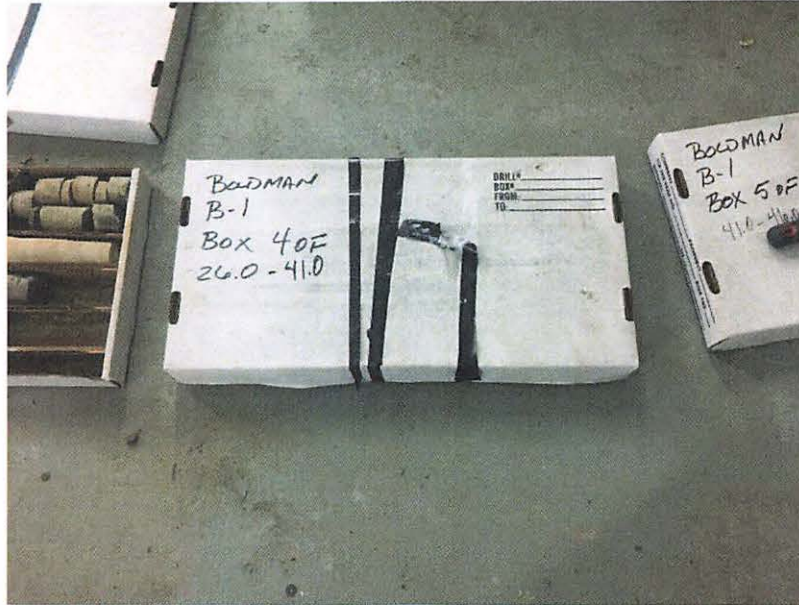


EAST KENTUCKY ENGINEERING, LLC.



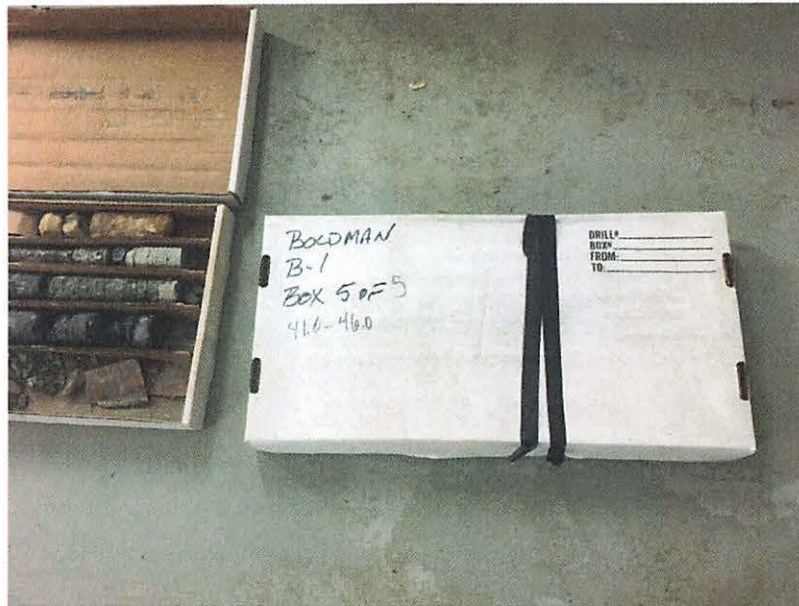


EAST KENTUCKY ENGINEERING, LLC.





EAST KENTUCKY ENGINEERING, LLC.





EAST KENTUCKY ENGINEERING, LLC.

APPENDIX C SEISMIC DATA



Latitude, Longitude: 37.520531, -82.628019



Map data ©2020

Date

8/7/2020, 2:01:04 PM

Design Code Reference Document

IBC-2015

Risk Category

II

Site Class

A - Hard Rock

Type	Value	Description
S _S	0.191	MCE _R ground motion. (for 0.2 second period)
S ₁	0.084	MCE _R ground motion. (for 1.0s period)
S _{MS}	0.153	Site-modified spectral acceleration value
S _{M1}	0.067	Site-modified spectral acceleration value
S _{DS}	0.102	Numeric seismic design value at 0.2 second SA
S _{D1}	0.045	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	A	Seismic design category
F _a	0.8	Site amplification factor at 0.2 second
F _v	0.8	Site amplification factor at 1.0 second
PGA	0.092	MCE _G peak ground acceleration
F _{PGA}	0.8	Site amplification factor at PGA
PGA _M	0.074	Site modified peak ground acceleration
T _L	12	Long-period transition period in seconds
SsRT	0.191	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.209	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.084	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.093	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
C _{RS}	0.915	Mapped value of the risk coefficient at short periods
C _{R1}	0.908	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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EAST KENTUCKY ENGINEERING, LLC.

APPENDIX D PHOTOGRAPHS



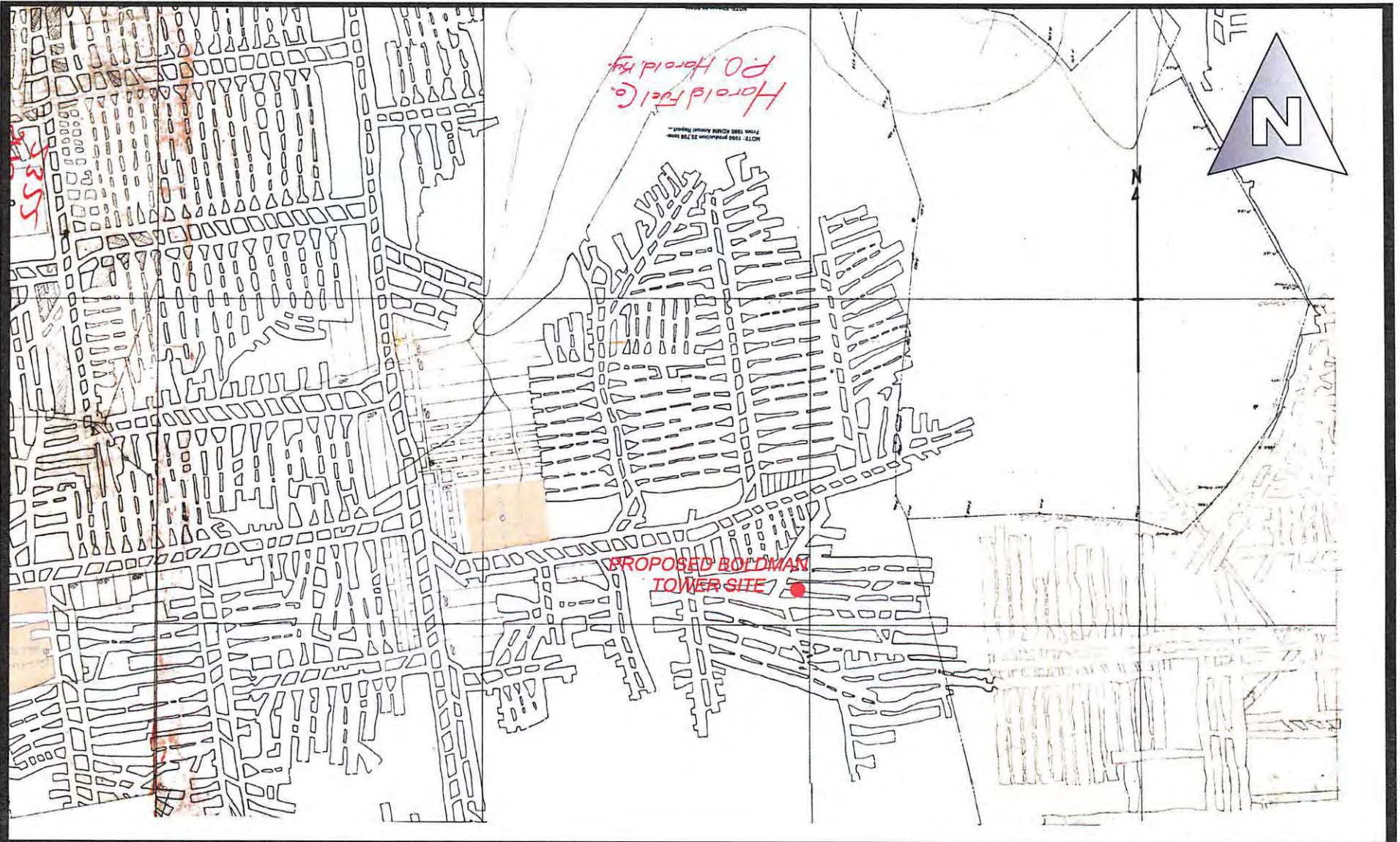
EAST KENTUCKY ENGINEERING, LLC.



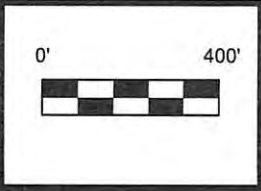


EAST KENTUCKY ENGINEERING, LLC.

APPENDIX E MAPS



Drawn:	Date: 7/17/20
Job:	Scale: 1" = 400'
Drawing:	
Tool Palette EKYENG	

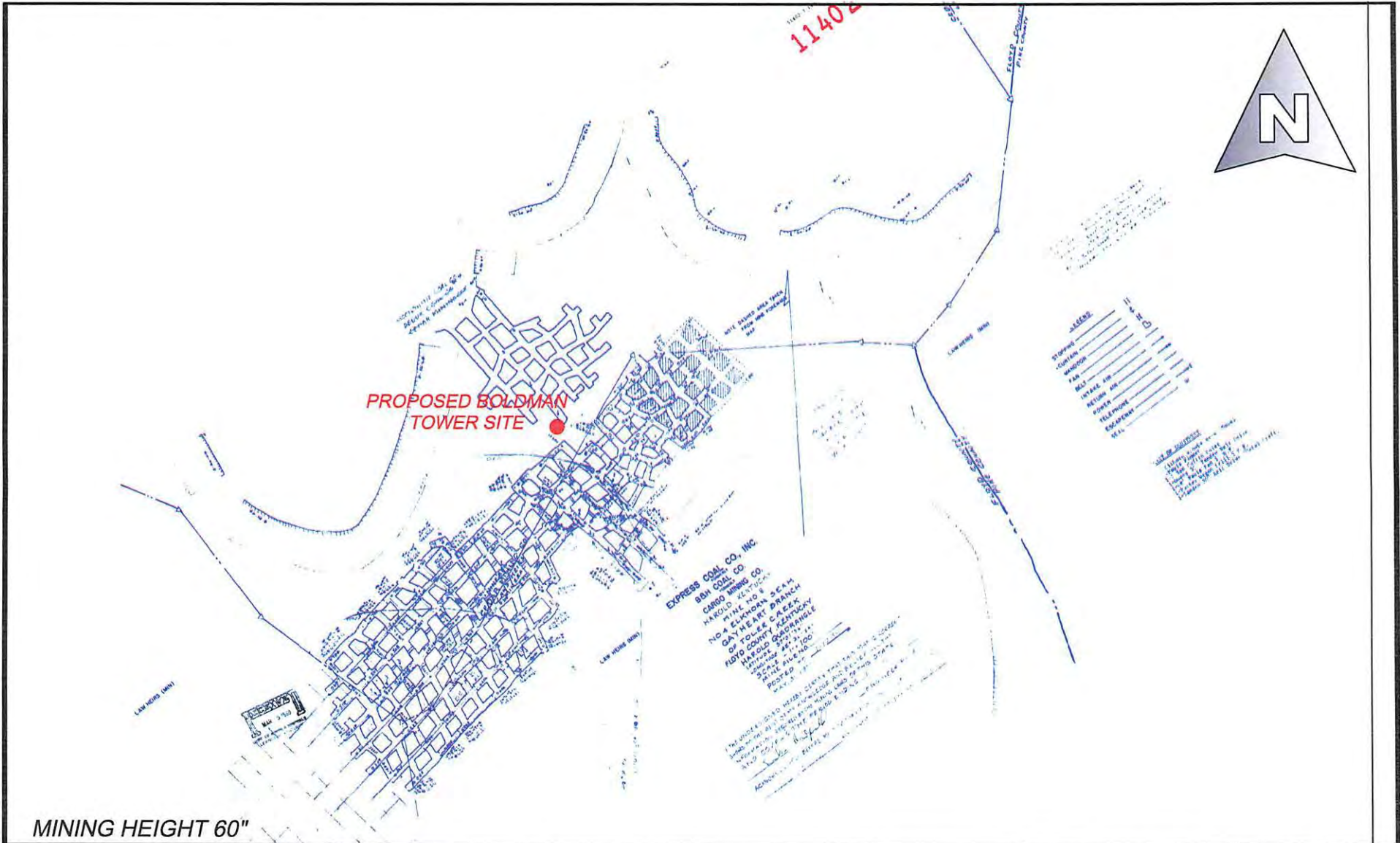


BOLDMAN PROPOSED TOWER SITE
FLOYD COUNTY KENTUCKY
HAROLD FUEL COMPANY
ELKHORN NO 1 SEAM

East Kentucky Engineering, LLC



230 Swartz Drive
 Hazard, KY 41701
 (606) 551-1050



MINING HEIGHT 60"

Drawn:	Date: 7/17/20
Job:	Scale: 1" = 400'
Drawing:	
Tool Palette EKYENG	

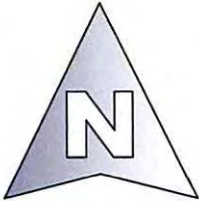


**BOLDMAN PROPOSED TOWER SITE
 FLOYD COUNTY KENTUCKY
 EXPRESS COAL
 ELKHORN NO 4 SEAM**

East Kentucky Engineering, LLC



230 Swartz Drive
 Hazard, KY 41701
 (606) 551-1050



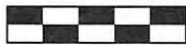
Drawn: Date: 7/17/20

Job: Scale: 1"= 400'

Drawing:

Tool Palette EKYENG

0' 400'

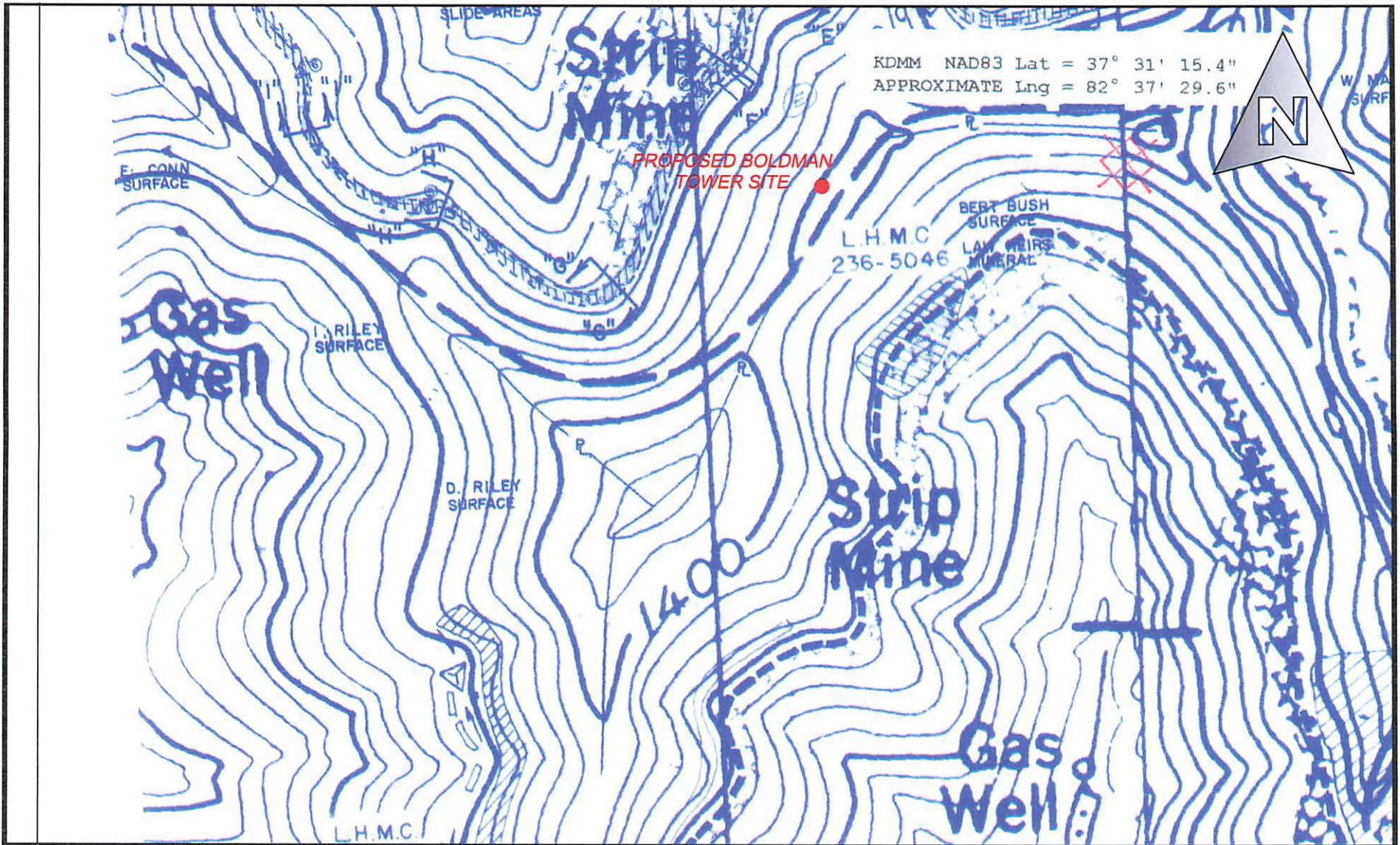


**BOLDMAN PROPOSED TOWER SITE
 FLOYD COUNTY KENTUCKY
 LOWER HURRICANE CREEK MINING CO
 FIRECLAY SEAM**

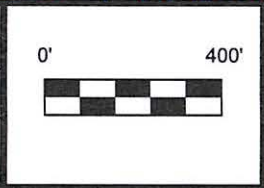
East Kentucky Engineering, LLC



230 Swartz Drive
 Hazard, KY 41701
 (606) 551-1050



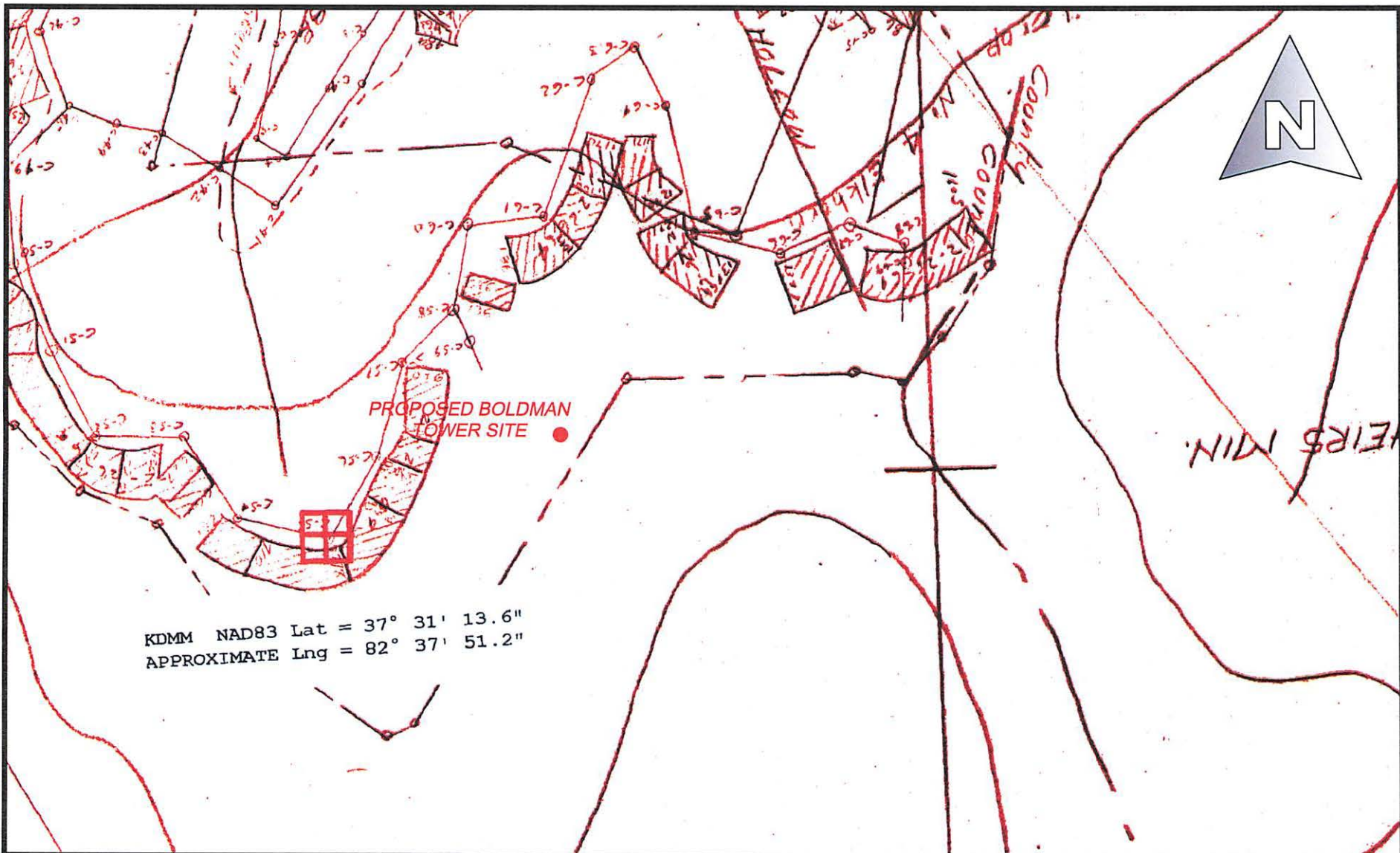
Drawn:	Date: 7/17/20
Job:	Scale: 1" = 400'
Drawing:	
Tool Palette: EKYENG	



BOLDMAN PROPOSED TOWER SITE
FLOYD COUNTY KENTUCKY
LOWER HURRICANE CREEK MINING CO
FIRECLAY SEAM AUGER MINING

East Kentucky Engineering, LLC

 230 Swartz Drive
 Hazard, KY 41701
 (606) 551-1050

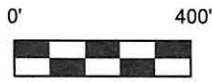


KDMM NAD83 Lat = 37° 31' 13.6"
 APPROXIMATE Lng = 82° 37' 51.2"

Drawn: Date: 7/17/20

Job: Scale: 1" = 400'

Drawing:
 Tool Palette: EKYENG

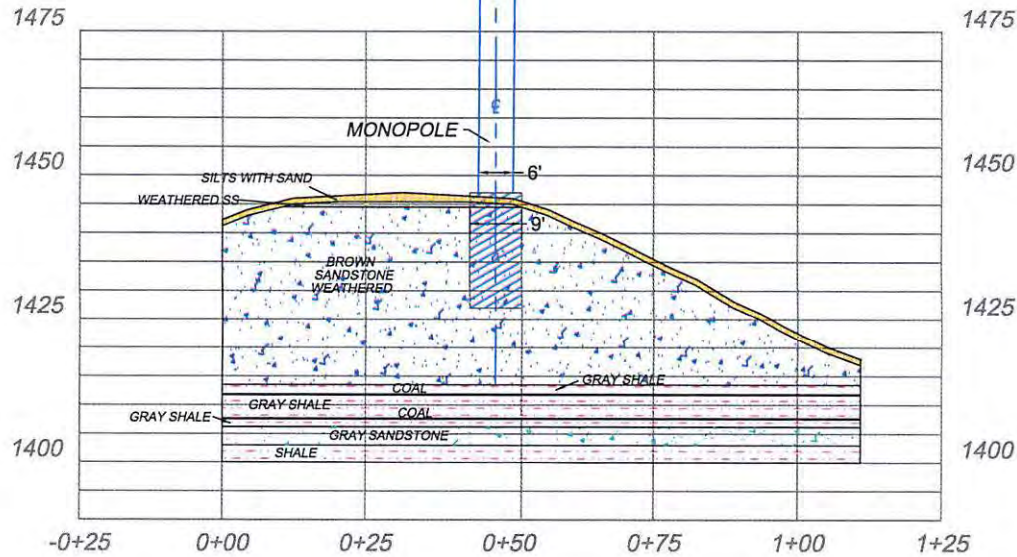


**BOLDMAN PROPOSED TOWER SITE
 FLOYD COUNTY KENTUCKY
 CEDAR MINING COMPANY
 ELKHORN NO 2 - 5 SEAM SURFACE MAP**

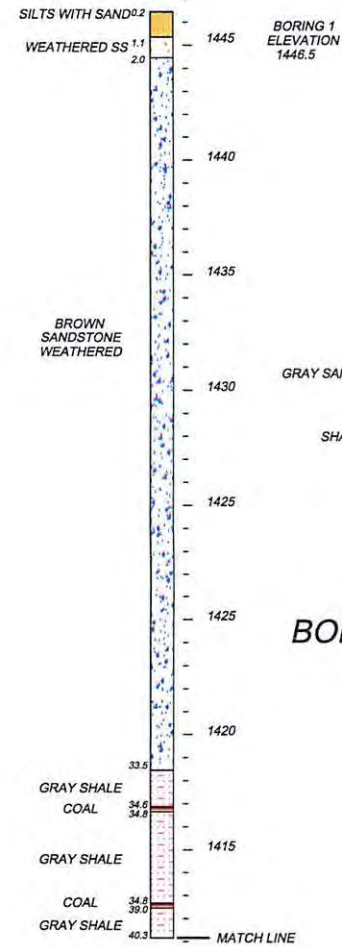
East Kentucky Engineering, LLC



230 Swartz Drive
 Hazard, KY 41701
 (606) 551-1050

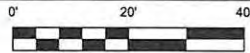


SITE CROSS SECTION
1" = 20'



East Kentucky Engineering, LLC

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



Drawn by: RDS 7/17/2020
Job #: 165-0094 Scale: 1" = AS NOTED
File Location:

**APPALACHIAN WIRELESS
PROPOSED TOWER LOCATION
BOLDMAN SITE
FLOYD COUNTY, KENTUCKY**

Exhibit 5

Page 1 of 2	Job Number: 23520-246
Eng: MFP	Customer Ref: TP-19153
	Date: 8/12/2020
Structure: 240-FT MONOPOLE	
Site: BOLDMAN	
Location: FLOYD CO., KY / 37°31'13", -82°37'40"	
Owner: WORLD TOWER	
Revision No.: Revision Date:	

DESIGN

Building Code: 2018 KENTUCKY BUILDING CODE
Design Standard: ANSI/TIA-222-G
Wind Speed Load Cases: ASCE-7-05 CONVERTED TO ASCE-7-10
Load Case #1: 90 MPH Design Wind Speed - V_{ASD} ($V_{ASD} = 116$ MPH)
Load Case #2: 30 MPH Wind with 0.75" Ice Accumulation
Load Case #3: 60 MPH Service Wind Speed
Structure Class II Risk Category C Exposure Cat. I Topography Cat. I Crest Height

STRUCTURE MEETS THE MINIMUM REQUIREMENTS OF TIA-222-H

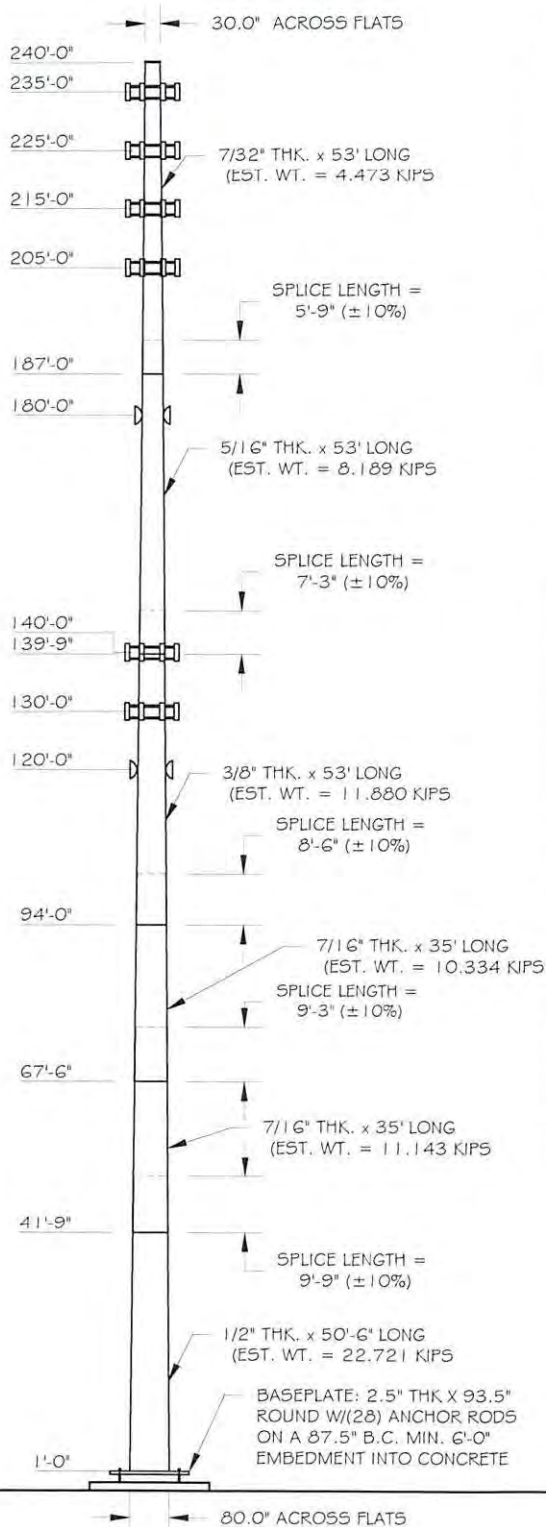
EQUIPMENT LIST

Elev.	Description
TOP	(1) BEACON LIGHT + 4' LIGHTNING ROD
235	(12) NN-65A-M ANTENNAS + (12) RRU
235	SECTOR FRAMES
225	(12) NN-65A-M ANTENNAS + (12) RRU
225	SECTOR FRAMES
215	(12) NN-65A-M ANTENNAS + (12) RRU
215	SECTOR FRAMES
205	(12) NN-65A-M ANTENNAS + (12) RRU
205	SECTOR FRAMES
180	(2) 6-FT DISH
180	DUAL MICROWAVE MOUNT
140	(12) NN-65A-M ANTENNAS + (12) RRU
140	SECTOR FRAMES
130	(12) NN-65A-M ANTENNAS + (12) RRU
130	SECTOR FRAMES
120	(2) 8-FT DISH
120	DUAL MICROWAVE MOUNT

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE

STRUCTURE PROPERTIES

Cross-Section: 18-Sided	Taper: 0.22411 in/ft				
Shaft Steel: ASTM A572 GR 65	Baseplate Steel: ASTM A572 GR 50				
Anchor Rods: 2.25 in. AG 15 GR. 75 X 7'-0"					
Secl.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	53.00	0.2188	5.75	30.00	41.88
2	53.00	0.3125	7.25	40.15	52.03
3	53.00	0.3750	8.50	49.78	61.66
4	35.00	0.4375	9.25	59.00	66.85
5	35.00	0.4375	9.75	63.90	71.74
6	50.50	0.5000	0.00	68.68	80.00

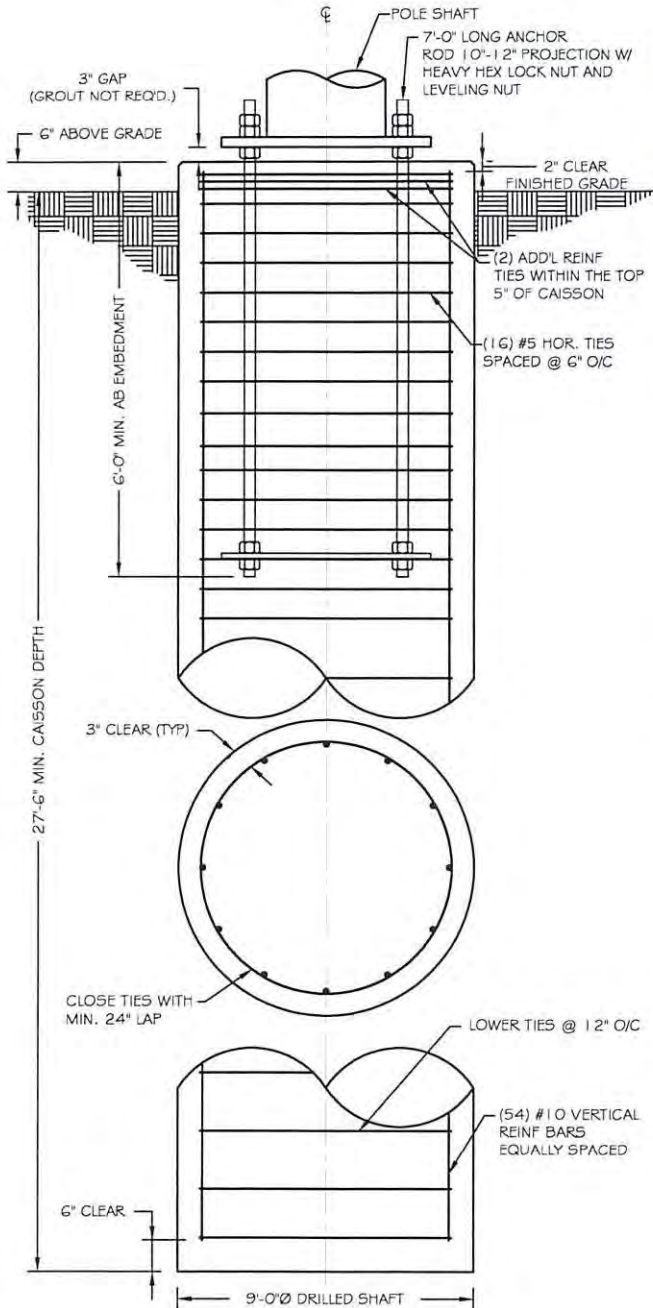


MICHAEL F. PLAHOVINSAK, P.E. #25466
 State: Kentucky - Independent Engineer
 18301 S.R. Rd., Plain City, OH 43064
 614-396-6250 / mick@mtpeco.com

BASE REACTIONS FOR FOUNDATION DESIGN

Moment: 12197 ft-kip
 Shear: 75 kip
 Axial: 128 kip

Page 2 of 2	Job Number: 23520-246
Eng: MFP	Customer Ref: TP-19153
	Date: 8/12/2020
Structure: 240-FT MONOPOLE	
Site: BOLDMAN	
Location: FLOYD CO., KY / 37°31'13", -82°37'40"	
Owner: WORLD TOWER	
Revision No.: Revision Date:	



CAISSON FOUNDATION

NOT TO SCALE

FOUNDATION NOTES:

- ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.46. IN AREAS OF POTENTIAL FREEZING, CONCRETE SHALL BE AIR ENTRAINED 6% ($\pm 1.5\%$). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.
- ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.
- CAISSON FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 336, "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DRILLED PIERS", LATEST EDITION.
- THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.
- FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: EAST KENTUCKY ENGINEERING
REPORT NO.: 165-00-0094 (DATED 7/17/20)
- ESTIMATED CONCRETE VOLUME = 66 CUBIC YARDS.
- THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 12197 FT*KIPS
SHEAR: 75 KIPS
AXIAL: 128 KIPS
- GEOTECHNICAL REPORT INDICATES POTENTIAL MINE WORKINGS BENEATH THE SITE. OWNER SHOULD CONSULT GEOTECHNICAL ENGINEER ABOUT RISKS ASSOCIATED WITH SITE.



tnxTower Michael F. Plahovinsak, PE 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 240-ft Monopole - MFP #23520-246 r1	Page 1 of 11
	Project Boldman	Date 16:07:19 08/12/20
	Client TP-19153	Designed by JC

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Floyd County, Kentucky.

Basic wind speed of 90 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 30 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	240.00-187.00	53.00	5.75	18	30.0000	41.8779	0.2188	0.8750	A572-65 (65 ksi)
L2	187.00-139.75	53.00	7.25	18	40.1517	52.0296	0.3125	1.2500	A572-65 (65 ksi)
L3	139.75-94.00	53.00	8.50	18	49.7798	61.6577	0.3750	1.5000	A572-65 (65 ksi)
L4	94.00-67.50	35.00	9.25	18	59.0027	66.8466	0.4375	1.7500	A572-65 (65 ksi)
L5	67.50-41.75	35.00	9.75	18	63.8986	71.7425	0.4375	1.7500	A572-65 (65 ksi)
L6	41.75-1.00	50.50		18	68.6824	80.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	30.4291	20.6775	2316.9742	10.5723	15.2400	152.0324	4636.9972	10.3407	4.8950	22.377
	42.4902	28.9245	6341.9517	14.7890	21.2740	298.1086	12692.2483	14.4650	6.9855	31.934
L2	42.0315	39.5155	7923.6904	14.1429	20.3971	388.4717	15857.8069	19.7615	6.5167	20.853
	52.7840	51.2969	17333.9400	18.3596	26.4310	655.8174	34690.6885	25.6533	8.6072	27.543
L3	52.1398	58.8041	18133.5734	17.5387	25.2881	717.0781	36291.0073	29.4076	8.1012	21.603
	62.5510	72.9417	34609.0006	21.7554	31.3221	1104.9385	69263.5407	36.4778	10.1918	27.178
L4	61.7798	81.3252	35240.5230	20.7907	29.9734	1175.7268	70527.4165	40.6703	9.6145	21.976
	67.8104	92.2174	51381.3775	23.5752	33.9581	1513.0822	102830.364	46.1174	10.9950	25.131
L5	66.9219	88.1237	44837.8973	22.5287	32.4605	1381.3069	89734.7934	44.0702	10.4762	23.945
	72.7817	99.0159	63603.6521	25.3133	36.4452	1745.1869	127290.995	49.5173	11.8567	27.101

tnxTower Michael F. Plahovinsak, PE 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 240-ft Monopole - MFP #23520-246 r1	Page 2 of 11
	Project Boldman	Date 16:07:19 08/12/20
	Client TP-19153	Designed by JC

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L6	71.8836	108.2055	63552.2965	24.2048	34.8907	1821.4702	127188.216	54.1130	11.2081	22.416
	81.1570	126.1665	100743.204	28.2225	40.6400	2478.9174	201618.970	63.0952	13.2000	26.4
			9				7			
							4			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 240.00-187.00				1	1	1			
L2 187.00-139.75				1	1	1			
L3 139.75-94.00				1	1	1			
L4 94.00-67.50				1	1	1			
L5 67.50-41.75				1	1	1			
L6 41.75-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A	Weight	
							ft ² /ft	plf	
1 5/8	B	No	Yes	Inside Pole	235.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
1 5/8	B	No	Yes	Inside Pole	225.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
1 5/8	B	No	Yes	Inside Pole	215.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
1 5/8	B	No	Yes	Inside Pole	205.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
1 5/8	B	No	Yes	Inside Pole	140.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
1 5/8	B	No	Yes	Inside Pole	130.00 - 1.00	18	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
EW63	B	No	Yes	Inside Pole	180.00 - 1.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.51 0.51 0.51
EW63	B	No	Yes	Inside Pole	120.00 - 1.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.51 0.51 0.51

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	240.00-187.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	2.47

tnxTower Michael F. Plahovinsak, PE 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 240-ft Monopole - MFP #23520-246 r1	Page 3 of 11
	Project Boldman	Date 16:07:19 08/12/20
	Client TP-19153	Designed by JC

Tower Section	Tower Elevation ft	Face	A_R	A_F	C_{iA_i}	C_{oA_o}	Weight K
			ft ²	ft ²	In Face ft ²	Out Face ft ²	
L2	187.00-139.75	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	3.62
L3	139.75-94.00	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	5.10
L4	94.00-67.50	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	3.08
L5	67.50-41.75	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	3.00
L6	41.75-1.00	C	0.000	0.000	0.000	0.000	0.00
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	4.74
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R	A_F	C_{iA_i}	C_{oA_o}	Weight K
				ft ²	ft ²	In Face ft ²	Out Face ft ²	
L1	240.00-187.00	A	1.807	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	2.47
		C		0.000	0.000	0.000	0.000	0.00
L2	187.00-139.75	A	1.759	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	3.62
		C		0.000	0.000	0.000	0.000	0.00
L3	139.75-94.00	A	1.702	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	5.10
		C		0.000	0.000	0.000	0.000	0.00
L4	94.00-67.50	A	1.640	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	3.08
		C		0.000	0.000	0.000	0.000	0.00
L5	67.50-41.75	A	1.577	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	3.00
		C		0.000	0.000	0.000	0.000	0.00
L6	41.75-1.00	A	1.439	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	4.74
		C		0.000	0.000	0.000	0.000	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C_{iA_i}	C_{oA_o}	Weight
			Horz	Lateral			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
Beacon Lighting	A	From Leg	0.00	0.0000	240.00	No Ice	1.50	1.50	0.05
			0.00	0.0000		1/2" Ice	2.00	2.00	0.07
			1.00	0.0000		1" Ice	2.50	2.50	0.09
Lightning Rod 5/8x4'	C	From Leg	0.00	0.0000	240.00	No Ice	0.25	0.25	0.03
			0.00	0.0000		1/2" Ice	0.66	0.66	0.03
			2.00	0.0000		1" Ice	0.97	0.97	0.04

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	Client		TP-19153		Designed by	JC

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
WD13X53 Antenna Mounting Frame	A	From Leg	1.50	0.0000	235.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	235.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	235.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	235.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	235.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	235.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	235.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	235.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	235.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10

WD13X53 Antenna Mounting Frame	A	From Leg	1.50	0.0000	225.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	225.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	225.00	No Ice	9.71	5.18	0.40
			0.00			1/2" Ice	13.89	7.60	1.60
			0.00			1" Ice	18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	225.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	225.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	225.00	No Ice	12.31	4.91	0.08
			0.00			1/2" Ice	12.77	5.54	0.16
			0.00			1" Ice	13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	225.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	225.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	225.00	No Ice	3.14	1.25	0.06
			0.00			1/2" Ice	3.36	1.41	0.08
			0.00			1" Ice	3.59	1.56	0.10

WD13X53 Antenna	A	From Leg	1.50	0.0000	215.00	No Ice	9.71	5.18	0.40

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	Client	TP-19153	Designed by	JC

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
Mounting Frame			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	215.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	215.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	215.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	215.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	215.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	215.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	215.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	215.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10

WD13X53 Antenna Mounting Frame	A	From Leg	1.50	0.0000	205.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	205.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	205.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60
			0.00		1" Ice	18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	205.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	205.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	205.00	No Ice	12.31	4.91
			0.00		1/2" Ice	12.77	5.54	0.16
			0.00		1" Ice	13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	205.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	205.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	205.00	No Ice	3.14	1.25
			0.00		1/2" Ice	3.36	1.41	0.08
			0.00		1" Ice	3.59	1.56	0.10

WD13X53 Antenna Mounting Frame	A	From Leg	1.50	0.0000	140.00	No Ice	9.71	5.18
			0.00		1/2" Ice	13.89	7.60	1.60

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Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K
			0.00			1" Ice 18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	140.00	No Ice 9.71	5.18	0.40
			0.00			1/2" Ice 13.89	7.60	1.60
			0.00			1" Ice 18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	140.00	No Ice 9.71	5.18	0.40
			0.00			1/2" Ice 13.89	7.60	1.60
			0.00			1" Ice 18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	140.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	140.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	140.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	140.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	140.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	140.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10

WD13X53 Antenna Mounting Frame	A	From Leg	1.50	0.0000	130.00	No Ice 9.71	5.18	0.40
			0.00			1/2" Ice 13.89	7.60	1.60
			0.00			1" Ice 18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	B	From Leg	1.50	0.0000	130.00	No Ice 9.71	5.18	0.40
			0.00			1/2" Ice 13.89	7.60	1.60
			0.00			1" Ice 18.07	10.02	2.80
WD13X53 Antenna Mounting Frame	C	From Leg	1.50	0.0000	130.00	No Ice 9.71	5.18	0.40
			0.00			1/2" Ice 13.89	7.60	1.60
			0.00			1" Ice 18.07	10.02	2.80
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	A	From Leg	3.00	0.0000	130.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	B	From Leg	3.00	0.0000	130.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) Commscope NN-65A-M w/ mt. pipe* (54.9" x 26.9" x 7.1")	C	From Leg	3.00	0.0000	130.00	No Ice 12.31	4.91	0.08
			0.00			1/2" Ice 12.77	5.54	0.16
			0.00			1" Ice 13.23	6.18	0.25
(4) RRU-12	A	From Leg	2.00	0.0000	130.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10
(4) RRU-12	B	From Leg	2.00	0.0000	130.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10
(4) RRU-12	C	From Leg	2.00	0.0000	130.00	No Ice 3.14	1.25	0.06
			0.00			1/2" Ice 3.36	1.41	0.08
			0.00			1" Ice 3.59	1.56	0.10

Dish Mount	B	From Leg	0.50	0.0000	180.00	No Ice 1.62	1.62	0.02
			0.00			1/2" Ice 2.34	2.34	0.04
			0.00			1" Ice 2.69	2.69	0.06

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Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₁ Side ft ²	Weight K	
Dish Mount	C	From Leg	0.50	0.0000	180.00	No Ice	1.62	1.62	0.02
			0.00			1/2" Ice	2.34	2.34	0.04
			0.00			1" Ice	2.69	2.69	0.06
Dish Mount	B	From Leg	0.50	0.0000	120.00	No Ice	1.62	1.62	0.02
			0.00			1/2" Ice	2.34	2.34	0.04
			0.00			1" Ice	2.69	2.69	0.06
Dish Mount	C	From Leg	0.50	0.0000	120.00	No Ice	1.62	1.62	0.02
			0.00			1/2" Ice	2.34	2.34	0.04
			0.00			1" Ice	2.69	2.69	0.06

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K	
8 FT DISH	B	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		120.00	8.00	No Ice	50.30	0.25
				0.00					1/2" Ice	51.29	0.51
				0.00					1" Ice	52.28	0.78
8 FT DISH	C	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		120.00	8.00	No Ice	50.30	0.25
				0.00					1/2" Ice	51.29	0.51
				0.00					1" Ice	52.28	0.78
6 FT DISH	B	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		180.00	6.00	No Ice	28.27	0.14
				0.00					1/2" Ice	29.05	0.29
				0.00					1" Ice	29.83	0.44
6 FT DISH	C	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		180.00	6.00	No Ice	28.27	0.14
				0.00					1/2" Ice	29.05	0.29
				0.00					1" Ice	29.83	0.44

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

tnxTower Michael F. Plahovinsak, PE 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job	240-ft Monopole - MFP #23520-246 r1	Page	8 of 11
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	Client	TP-19153	Designed by	JC

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	240 - 187	Pole	Max Tension	3	0.00	-0.00	-0.00
			Max. Compression	8	-98.27	0.08	-0.19
			Max. Mx	4	-17.47	-858.57	0.08
			Max. My	2	-17.52	0.04	857.81
			Max. Vy	4	32.15	-858.57	0.08
			Max. Vx	2	-32.11	0.04	857.81
			Max. Torque	4			0.10
L2	187 - 139.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-118.19	0.08	-2.73
			Max. Mx	4	-30.99	-2573.94	3.46
			Max. My	2	-31.13	0.04	2547.52
			Max. Vy	4	41.44	-2573.94	3.46
			Max. Vx	2	-40.69	0.04	2547.52
			Max. Torque	4			-1.78
L3	139.75 - 94	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-187.49	0.08	-6.98
			Max. Mx	4	-57.34	-5030.96	10.77
			Max. My	2	-57.53	0.04	4949.11
			Max. Vy	4	64.36	-5030.96	10.77
			Max. Vx	2	-62.43	0.04	4949.11
			Max. Torque	5			-5.24
L4	94 - 67.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-206.96	0.08	-6.96
			Max. Mx	4	-73.19	-6735.72	18.26
			Max. My	2	-73.34	0.04	6604.24
			Max. Vy	4	67.85	-6735.72	18.26
			Max. Vx	2	-65.93	0.04	6604.24
			Max. Torque	5			-5.23
L5	67.5 - 41.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-228.09	0.08	-6.94
			Max. Mx	4	-90.54	-8491.42	25.60
			Max. My	2	-90.64	0.04	8311.38
			Max. Vy	4	70.92	-8491.42	25.60
			Max. Vx	2	-69.01	0.04	8311.38
			Max. Torque	5			-5.22
L6	41.75 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-271.43	0.08	-6.89
			Max. Mx	4	-127.63	-12197.30	40.11
			Max. My	2	-127.63	0.04	11921.69
			Max. Vy	4	75.15	-12197.30	40.11
			Max. Vx	2	-73.29	0.04	11921.69
			Max. Torque	5			-5.22

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	240 - 187	52.253	13	1.9252	0.0015
L2	192.75 - 139.75	33.787	13	1.7172	0.0016
L3	147 - 94	19.210	13	1.2795	0.0012
L4	102.5 - 67.5	9.144	13	0.8423	0.0007
L5	76.75 - 41.75	5.119	13	0.6227	0.0005
L6	51.5 - 1	2.310	13	0.4091	0.0003

tnxTower Michael F. Plahovinsak, PE 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mfpeng.com	Job 240-ft Monopole - MFP #23520-246 r1	Page 9 of 11
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Critical Deflections and Radius of Curvature - Service Wind

Elevation <i>ft</i>	Appurtenance	Gov. Load Comb.	Deflection <i>in</i>	Tilt °	Twist °	Radius of Curvature <i>ft</i>
240.00	Beacon Lighting	13	52.253	1.9252	0.0015	62767
235.00	WD13X53 Antenna Mounting Frame	13	50.229	1.9099	0.0015	62767
225.00	WD13X53 Antenna Mounting Frame	13	46.199	1.8775	0.0015	20922
215.00	WD13X53 Antenna Mounting Frame	13	42.226	1.8396	0.0016	12552
205.00	WD13X53 Antenna Mounting Frame	13	38.349	1.7926	0.0016	8965
180.00	6 FT DISH	13	29.317	1.6140	0.0015	6343
140.00	WD13X53 Antenna Mounting Frame	13	17.354	1.2063	0.0011	5719
130.00	WD13X53 Antenna Mounting Frame	13	14.880	1.1042	0.0010	5770
120.00	8 FT DISH	13	12.614	1.0054	0.0009	5821

Maximum Tower Deflections - Design Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt °	Twist °
L1	240 - 187	211.598	4	7.8089	0.0053
L2	192.75 - 139.75	136.899	4	6.9661	0.0059
L3	147 - 94	77.873	4	5.1913	0.0046
L4	102.5 - 67.5	37.074	4	3.4169	0.0028
L5	76.75 - 41.75	20.755	4	2.5256	0.0018
L6	51.5 - 1	9.365	4	1.6589	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation <i>ft</i>	Appurtenance	Gov. Load Comb.	Deflection <i>in</i>	Tilt °	Twist °	Radius of Curvature <i>ft</i>
240.00	Beacon Lighting	4	211.598	7.8089	0.0053	16005
235.00	WD13X53 Antenna Mounting Frame	4	203.410	7.7469	0.0054	16005
225.00	WD13X53 Antenna Mounting Frame	4	187.111	7.6155	0.0057	5332
215.00	WD13X53 Antenna Mounting Frame	4	171.043	7.4619	0.0058	3196
205.00	WD13X53 Antenna Mounting Frame	4	155.360	7.2714	0.0060	2280
180.00	6 FT DISH	4	118.805	6.5476	0.0057	1604
140.00	WD13X53 Antenna Mounting Frame	4	70.350	4.8944	0.0043	1430
130.00	WD13X53 Antenna Mounting Frame	4	60.325	4.4799	0.0039	1439
120.00	8 FT DISH	4	51.141	4.0787	0.0035	1449

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Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	240 - 187 (1)	TP41.8779x30x0.2188	53.00	0.00	0.0	28.0297	-17.47	1641.27	0.011
L2	187 - 139.75 (2)	TP52.0296x40.1517x0.3125	53.00	0.00	0.0	49.6853	-30.99	3133.82	0.010
L3	139.75 - 94 (3)	TP61.6577x49.7798x0.375	53.00	0.00	0.0	70.6744	-57.34	4483.41	0.013
L4	94 - 67.5 (4)	TP66.8466x59.0027x0.4375	35.00	0.00	0.0	89.3387	-73.19	5855.29	0.013
L5	67.5 - 41.75 (5)	TP71.7425x63.8986x0.4375	35.00	0.00	0.0	95.9816	-90.54	6095.14	0.015
L6	41.75 - 1 (6)	TP80x68.6824x0.5	50.50	0.00	0.0	126.166	-127.63	7988.20	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio M _{ux} / φM _{ux}	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio M _{uy} / φM _{uy}
L1	240 - 187 (1)	TP41.8779x30x0.2188	858.57	1365.81	0.629	0.00	1365.81	0.000
L2	187 - 139.75 (2)	TP52.0296x40.1517x0.3125	2573.94	3233.23	0.796	0.00	3233.23	0.000
L3	139.75 - 94 (3)	TP61.6577x49.7798x0.375	5030.97	5482.65	0.918	0.00	5482.65	0.000
L4	94 - 67.5 (4)	TP66.8466x59.0027x0.4375	6735.75	7754.47	0.869	0.00	7754.47	0.000
L5	67.5 - 41.75 (5)	TP71.7425x63.8986x0.4375	8491.42	8676.42	0.979	0.00	8676.42	0.000
L6	41.75 - 1 (6)	TP80x68.6824x0.5	12197.33	13079.33	0.933	0.00	13079.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u / φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u / φT _n
L1	240 - 187 (1)	TP41.8779x30x0.2188	32.15	820.63	0.039	0.10	2737.20	0.000
L2	187 - 139.75 (2)	TP52.0296x40.1517x0.3125	41.44	1566.91	0.026	1.77	6480.47	0.000
L3	139.75 - 94 (3)	TP61.6577x49.7798x0.375	64.36	2241.71	0.029	5.22	10989.17	0.000
L4	94 - 67.5 (4)	TP66.8466x59.0027x0.4375	67.85	2927.64	0.023	5.22	15543.83	0.000
L5	67.5 - 41.75 (5)	TP71.7425x63.8986x0.4375	70.92	3047.57	0.023	5.21	17390.58	0.000
L6	41.75 - 1 (6)	TP80x68.6824x0.5	75.15	3994.10	0.019	5.20	26215.58	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P _u / φP _n	Ratio M _{ux} / φM _{ux}	Ratio M _{uy} / φM _{uy}	Ratio V _u / φV _n	Ratio T _u / φT _n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	240 - 187 (1)	0.011	0.629	0.000	0.039	0.000	0.641	1.000	4.8.2 ✓
L2	187 - 139.75 (2)	0.010	0.796	0.000	0.026	0.000	0.807	1.000	4.8.2 ✓
L3	139.75 - 94 (3)	0.013	0.918	0.000	0.029	0.000	0.931	1.000	4.8.2 ✓
L4	94 - 67.5 (4)	0.013	0.869	0.000	0.023	0.000	0.882	1.000	4.8.2 ✓

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Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L5	67.5 - 41.75 (5)	0.015	0.979	0.000	0.023	0.000	0.994 ✓	1.000	4.8.2 ✓
L6	41.75 - 1 (6)	0.016	0.933	0.000	0.019	0.000	0.949 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	240 - 187	Pole	TP41.8779x30x0.2188	1	-17.47	1641.27	64.1	Pass
L2	187 - 139.75	Pole	TP52.0296x40.1517x0.3125	2	-30.99	3133.82	80.7	Pass
L3	139.75 - 94	Pole	TP61.6577x49.7798x0.375	3	-57.34	4483.41	93.1	Pass
L4	94 - 67.5	Pole	TP66.8466x59.0027x0.4375	4	-73.19	5855.29	88.2	Pass
L5	67.5 - 41.75	Pole	TP71.7425x63.8986x0.4375	5	-90.54	6095.14	99.4	Pass
L6	41.75 - 1	Pole	TP80x68.6824x0.5	6	-127.63	7988.20	94.9	Pass
Summary								
Pole (L5)							99.4	Pass
RATING =							99.4	Pass

Michael F. Plahovinsak, P.E. 18301 State Route 161 W Plain City, OH 43064 Phone: 614-398-6250 email: mike@mfpeng.com	Job 240-ft monopole - MFP #23520-246	Page BP & AB Calc
	Project Boldman	Date 8/12/2020
	Client TAPP TP-19153	Designed by Mike

Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G

Factored Base Reactions:		Pole Shape:	Anchor Rods:	Base Plate:
Moment:	12197 ft-kips	18-Sided	(28) 2.25 in. A615 GR. 75	2.5 in. x 93.5 in. Round
Shear:	75 kips	Pole Dia. (D_p):	Anchor Rods Evenly Spaced	f _y = 50 ksi
Axial:	128 kips	80.00 in	On a 87.5 in Bolt Circle	

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

$\phi_t, \phi_v = 0.80$ TIA 4.9.9
 $I_{bolts} = 26796.88 \text{ in}^2$ Moment of Inertia
 $P_u = 244 \text{ kips}$ Compr Force
 $V_u = 2.7 \text{ kips}$ Shear Force
 $R_{nt} = 325.00 \text{ kips}$ Nominal Tensile Strength
 $n = 0.50$ for detail type (d)
Stress Rating = 95.7% Satisfies TIA-G 4.9.9

Base Plate Calculation According to TIA-222-G

$\phi = 0.90$ TIA 4.7
 $M_{PL} = 576.9 \text{ in-kip}$ Plate Moment
 $L = 9.0 \text{ in}$ Section Length
 $Z = 14.0$ Plastic Section Modulus
 $M_p = 701.2 \text{ in-kip}$ Plastic Moment
 $\phi M_n = 631.1 \text{ in-kip}$ Factored Resistance

Calculated Moment vs Factored Resistance

$576.91 \text{ in-kip} \leq 631 \text{ in-kip}$

Stress Rating = 91.4%

Anchor Rods Are Adequate	95.7% <input checked="" type="checkbox"/>
Base Plate is Adequate	91.4% <input checked="" type="checkbox"/>

Michael F. Plahovinsak, P.E. 18301 State Route 161 W Plain City, OH 43064 Phone: 614-398-6250 email: mike@mfpeng.com	Job	240-ft monopole - MFP #23520-246	Page	FND
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	Client	TAPP TP-19153	Designed by	Mike

Caisson Calculation

According to ANSI/TIA-222-G

- Foundation overturning resistance calculated with PLS Caisson, for Brom's method for rigid piles. Soil layers modeled after recommendations from the geotechnical report.
- Cohesion strength for the upper 27 ft has been reduced by 50%
- In lieu of a soil resistance factor $f_s = 0.75$ (TIA-9.4.1) an additional safety factor against soil failure of 1.33 has been applied.
- Foundation has been designed with factored loads per TIA-222-G.
- No groundwater within the depth of the foundation.

*** PIER PROPERTIES	CONCRETE STRENGTH (ksi) = 4.00	STEEL STRENGTH (ksi) = 60.00					
	DIAMETER (ft) = 9.000	DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50					
*** SOIL PROPERTIES	LAYER TYPE THICKNESS (ft) DEPTH AT TOP OF LAYER (ft) DENSITY (pcf) CU (pcf) KP (psf) PHI (degrees)						
	1 S 4.00 0.00 100.0 1.000 -0.00						
	2 S 29.00 4.00 150.0 2.663 27.00						
*** DESIGN (FACTORED) LOADS AT TOP OF PIER	MOMENT (ft-k) = 12197.0	VERTICAL (k) = 128.0 SHEAR (k) = 75.0					
	ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33						
*** CALCULATED PIER LENGTH (ft) = 28.000							
*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER							
TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (pcf)	KP (psf)	FORCE (k)	ARM (ft)
S	0.50	4.00	100.0		1.000	21.60	3.17
S	4.50	16.13	150.0		2.663	1866.55	14.58
S	20.63	7.37	150.0		2.663	-1787.37	24.52
*** SHEAR AND MOMENTS ALONG PIER							
	DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	MOMENT (ft-k)		
	0.00	100.8	16528.0	75.6	12396.3		
	2.80	93.6	16804.7	70.2	12603.8		
	5.60	41.0	17020.0	30.8	12765.3		
	8.40	-115.0	16936.1	-86.3	12702.4		
	11.20	-355.6	16297.0	-266.7	12223.1		
	14.00	-680.7	14865.9	-510.6	11149.7		
	16.80	-1090.4	12406.0	-817.8	9304.8		
	19.60	-1594.7	9680.7	-1188.5	6510.7		
	22.40	-1411.3	4109.4	-1058.5	3082.1		
	25.20	-747.9	1066.8	-560.9	800.1		
	28.00	0.0	-0.0	0.0	-0.0		
*** TOTAL REINFORCEMENT PCT = 0.72	REINFORCEMENT AREA (in ²) = 65.96						
*** USABLE AXIAL CAP. (k) = 128.0	USABLE MOMENT CAP. (ft-k) = 13074.9						

For Design:

9-ft Diameter caisson x 28-ft long (27.5-ft Embedded with 0.5-ft above grade)
 Concrete strength = 4000 PSI @ 28 days. Estimated Concrete Volume = 66 CY3.
 (54) #10 Vertical Rebar. Steel Cross-Section = 68.58 in²

Exhibit 6



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

Aeronautical Study No.
 2020-ASO-23851-OE
 Prior Study No.
 2017-ASO-7185-OE

Issued Date: 10/15/2020

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

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

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: Monopole Boldman
 Location: Boldman, KY
 Latitude: 37-31-13.89N NAD 83
 Longitude: 82-37-40.81W
 Heights: 1447 feet site elevation (SE)
 250 feet above ground level (AGL)
 1697 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 should continue to be marked/lighted utilizing 24-hr med-strobes.

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.

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)

As a result of this structure being critical to flight safety, it is required that the FAA be kept apprised as to the status of the project. Failure to respond to periodic FAA inquiries could invalidate this determination.

This aeronautical study included evaluation of a structure that exists at this time. Action will be taken to ensure aeronautical charts are updated to reflect the most current coordinates, elevation and height as indicated in the case description.

See attachment for additional condition(s) or information.

The use of a 24-hour medium intensity flashing white light system in urban and rural areas often results in complaints.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

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

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

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

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

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

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact our office at (718) 553-2611, or angelique.eersteling@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ASO-23851-OE.

Signature Control No: 447970900-453948501

(DNE)

Angelique Eersteling
Technician

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

cc: FCC

Additional information for ASN 2020-ASO-23851-OE

CORRECTION: TO ADD SUPPLEMENTAL NOTICE 7460-2 NOTIFICATION.

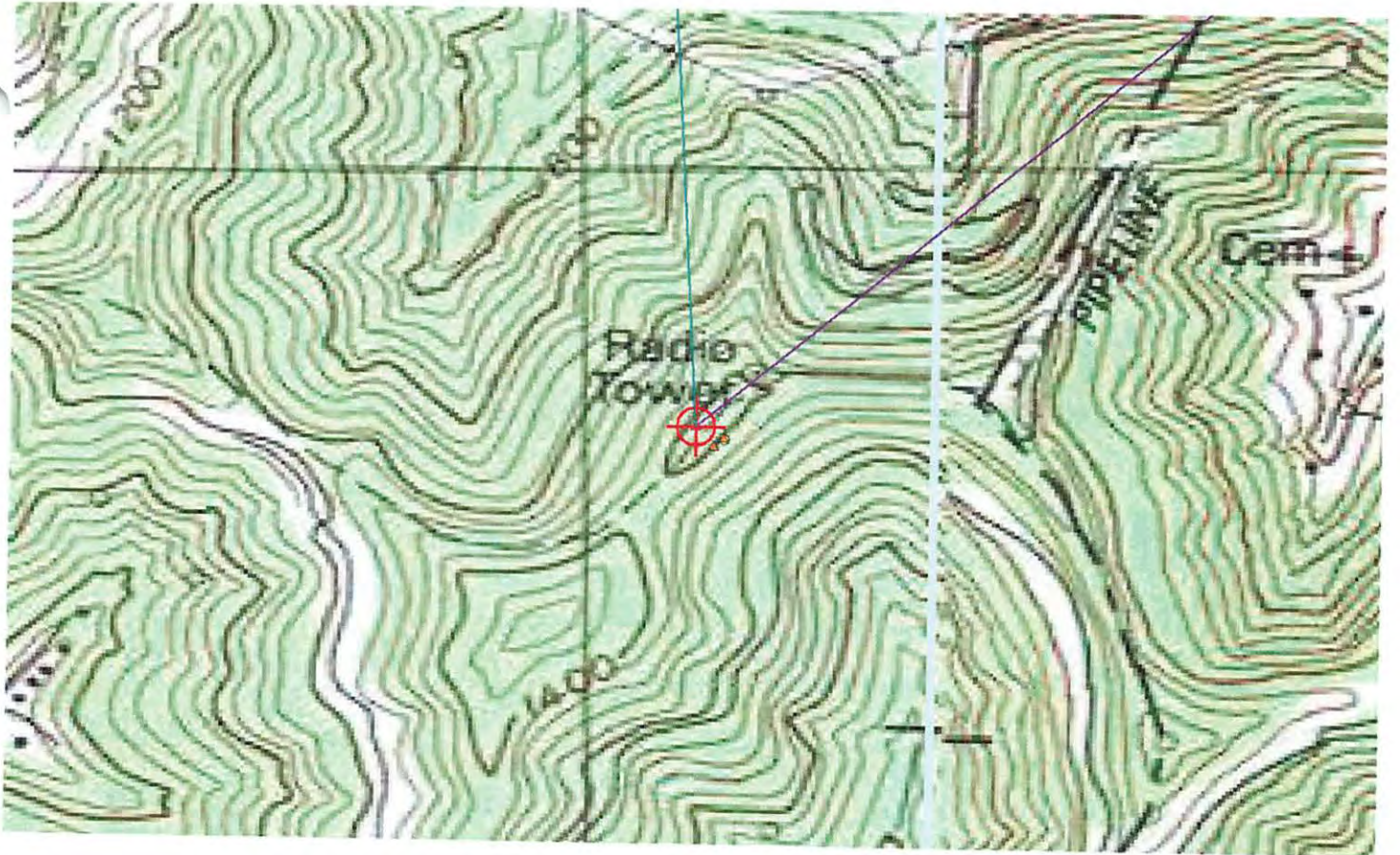
Request new tower has Night Vision Goggles (NVG) compatible lighting, along with any other required FAA markings.

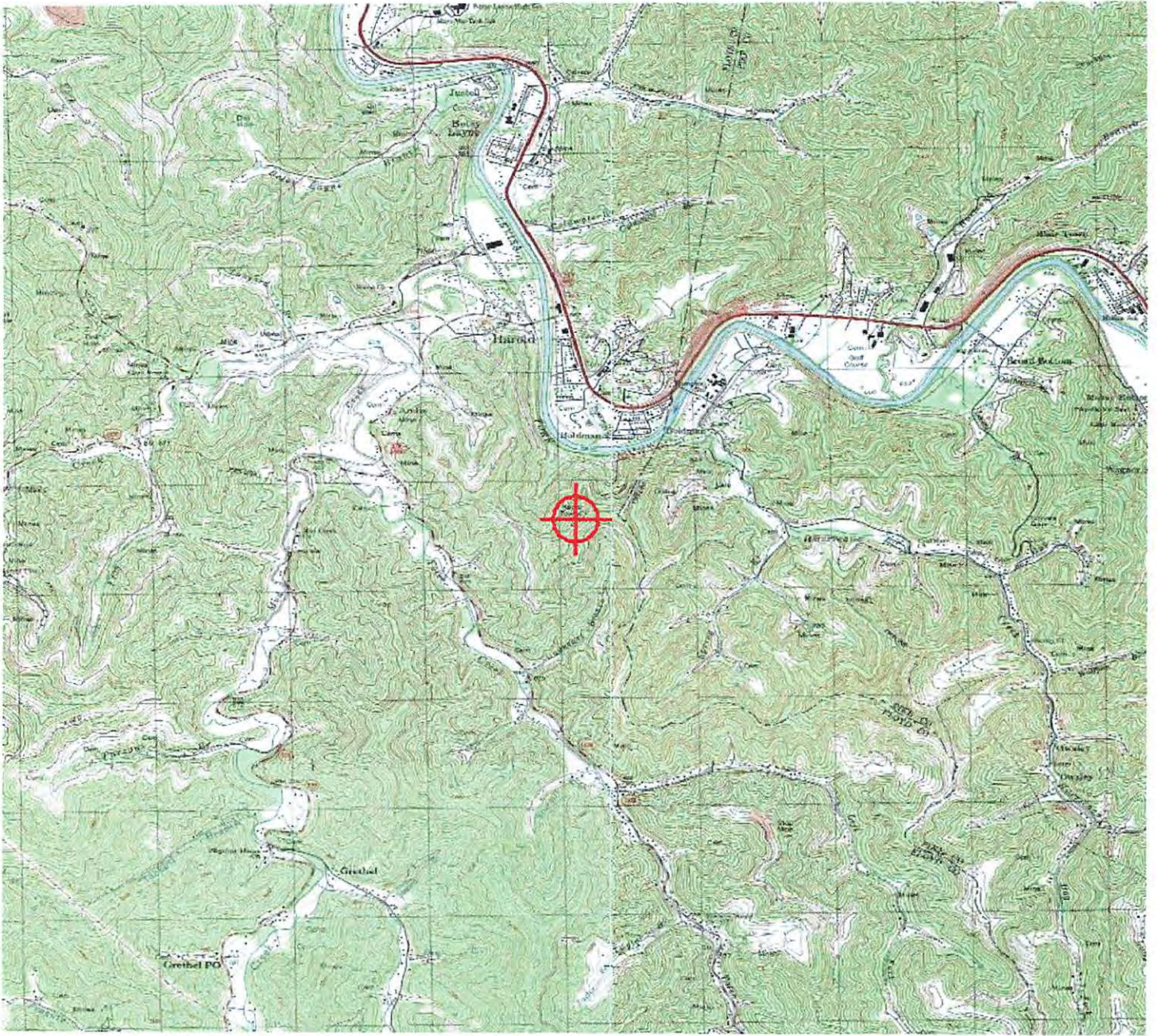
Case Description for ASN 2020-ASO-23851-OE

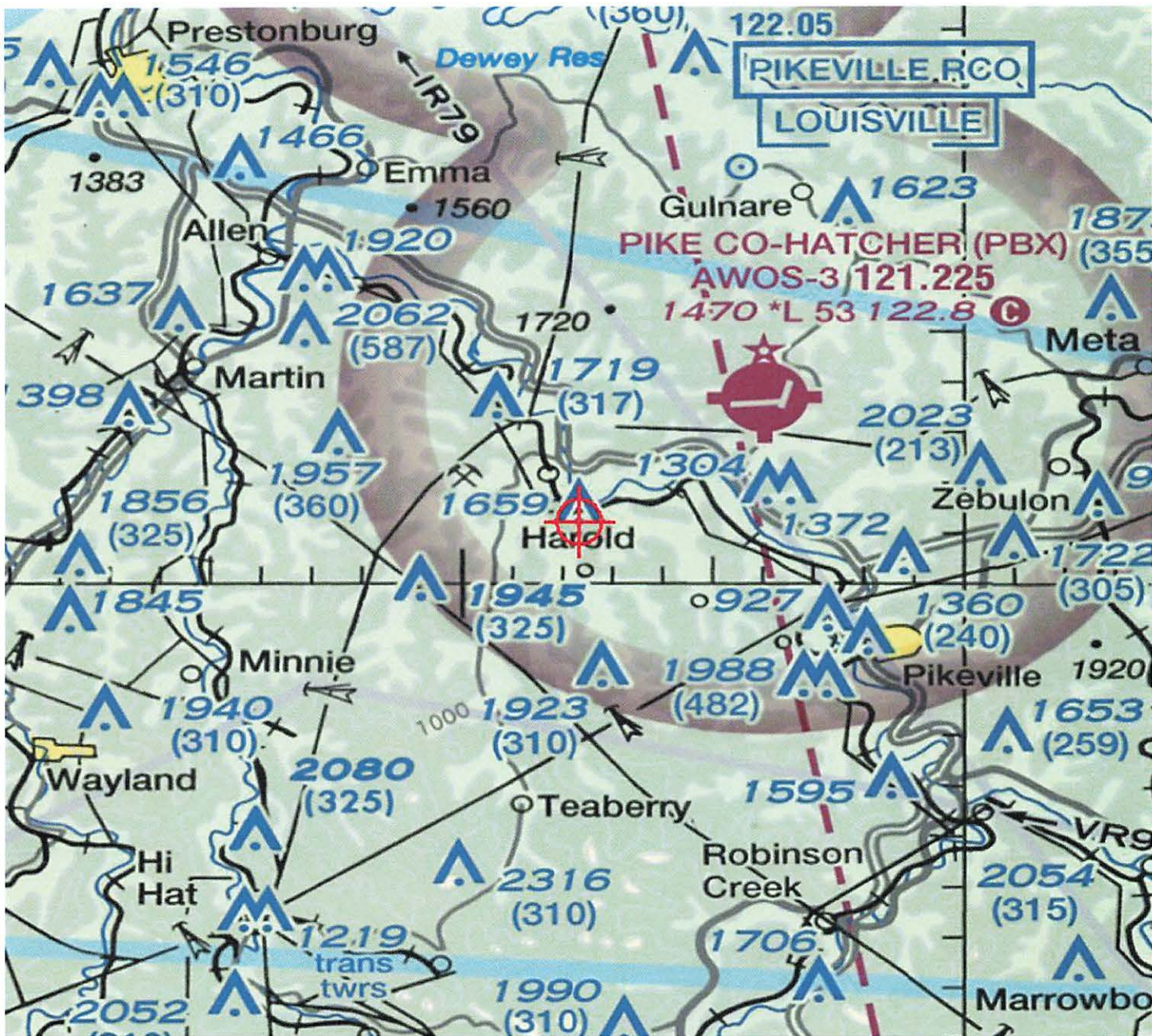
Replace the existing 259' structure with a new 240' tower with top mounted antennas (overall height of 250' AGL)

Frequency Data for ASN 2020-ASO-23851-OE

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









ANDY BESHEAR
Governor

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

JIM GRAY
Secretary

APPROVAL OF APPLICATION

October 15, 2020

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

SUBJECT: AS-FLOYD-PBX-2020-114

STRUCTURE: Antenna Tower (Replacement)
LOCATION: Boldman, KY
COORDINATES: 37° 31' 13.89" N / 82° 37' 40.81" W
HEIGHT: 250' AGL/1696' AMSL

The Kentucky Airport Zoning Commission has approved your application for a permit to construct 250' AGL/1696' AMSL Antenna Tower near Boldman, KY 37° 31' 13.89" N / 82° 37' 40.81" 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.

Medium Dual Obstruction Lighting Required.

Randall S. Royer

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



An Equal Opportunity Employer M/F/D

Exhibit 7

Driving Directions for Boldman

Starting at the intersection of Court Street and Central Avenue, head east in Prestonsburg, Kentucky. Drive .3 miles to the intersection of Central Avenue and South Lake Drive. Turn left onto South Lake Drive and travel 2.6 miles. Turn right onto KY-80 and travel 2.6 miles. Exit to your left onto U.S. 23. Drive approximately 13 miles and exit to your right onto KY 1384. Continue across the bridge and drive .6 miles. Turn right onto the gravel road. Turn right onto Still House Hollow (sign posted). Access thru the gate by appointment only (Private Property). Continue approximately one mile up the hill following the gravel road to the tower site. (sign posted).

Prepared By:
Daryl Bartley
Appalachian Wireless
606-477-2355

Boldman Replacement


Location:

915 Boldman Tower Road
Harold, KY 41635

Coordinates:

37° 31' 13.89" N
82° 37' 40.81" W

Legend

 1/2 Mile Search Area

Boldman Replacement 

Google Earth

© 2020 Google



4000 ft

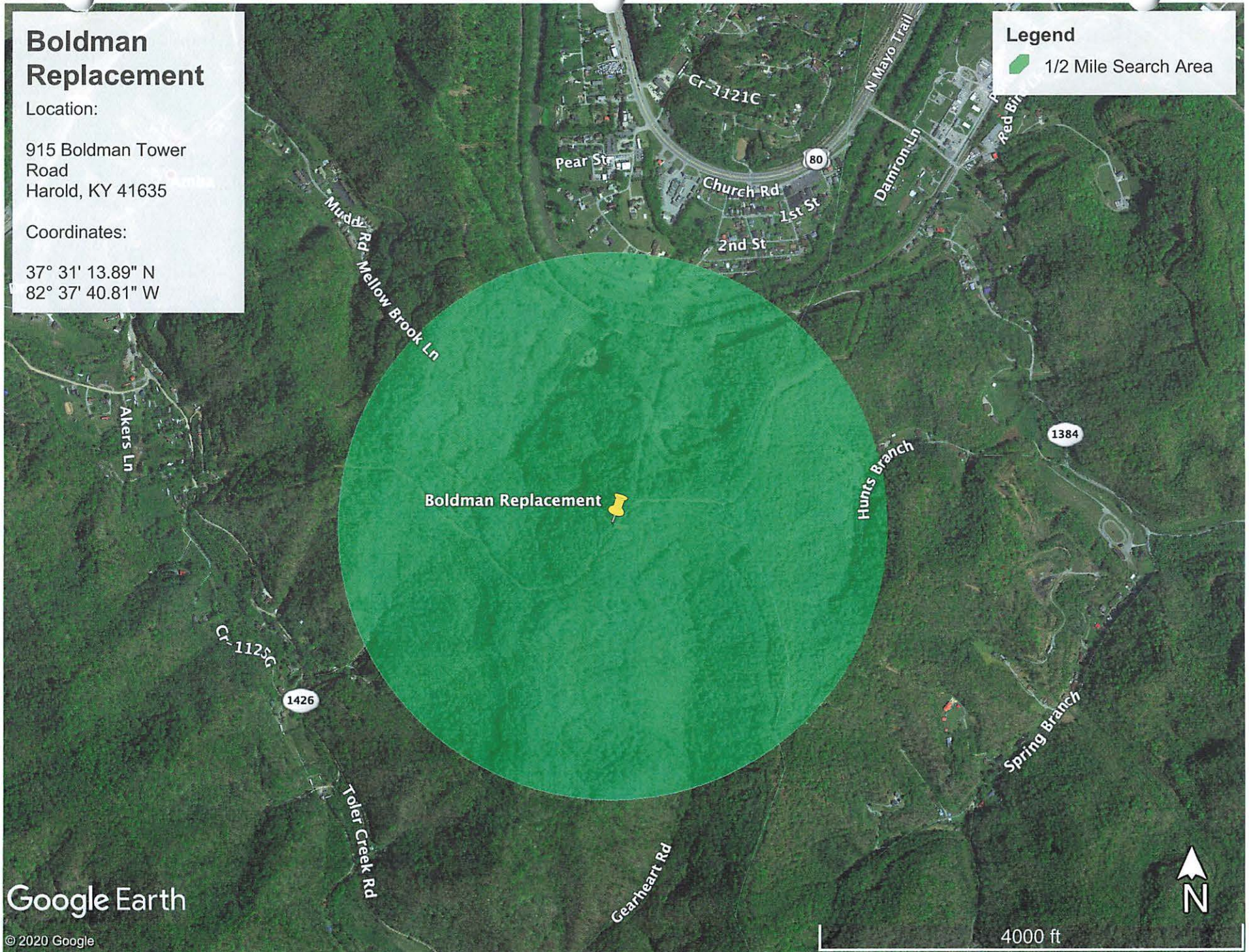


Exhibit 8

LODGED FOR RECORD

DATE 12-27-17

TIME 12:06 PM

FEE 23.00 JD

Chris Waugh
Clerk of Floyd County

BY [Signature]

Book 634 Page 310

MEMORANDUM OF AMENDMENT TO LEASE

THIS MEMORANDUM OF AMENDMENT TO LEASE (“Memorandum”) is made and entered into on this 20th day of December, 2017, with an effective date of June 1, 2016 (the “Effective Date”), by and between **PAUL DOUGLAS GEARHEART** and **LINDA GEARHEART**, husband and wife, with a mailing address of P.O. Box 401, Harold, Kentucky 41653, hereinafter referred to as “Lessors”, and **EAST KENTUCKY NETWORK, LLC D/B/A APPALACHIAN WIRELESS**, a Kentucky limited liability company, with a mailing address of 101 Technology Trail, Ivel, Kentucky, 41642, hereinafter referred to as “Lessee.”

WHEREAS, by Lease dated May 2, 1991, of record in the Floyd County Clerk’s Office in Contract Book 12, Page 635 (the “1991 Lease”), Paul R. Gearheart and Elaine Gearheart leased certain property described therein to Harold Telephone Company, Inc.; Foothills Rural Telephone Cooperative Corporation, Inc.; Mountain Rural Telephone Cooperative Corporation, Inc.; and Thacker-Grigsby Telephone Company, Inc., corporate partners doing business as Appalachian Cellular General Partnership (“ACGP”); and

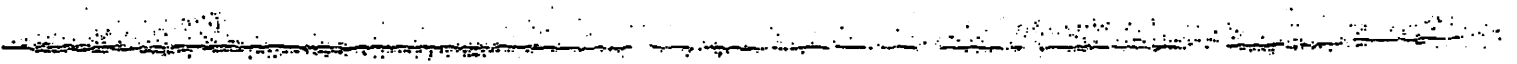
WHEREAS, the 1991 Lease was for a term of fifty (50) years, to expire on May 22, 2041; and

WHEREAS, the 1991 Lease was supplemented by the unrecorded Supplement to Lease dated October 1, 1998; and

WHEREAS, Lessors are the current owners of the property subject to the 1991 Lease by virtue of the Deed dated October 7, 2009, of record in the Floyd County Clerk’s Office in Deed Book 563, Page 81; and

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Fourth line of faint, illegible text.

Fifth line of faint, illegible text.

Sixth line of faint, illegible text.

Seventh line of faint, illegible text.

Eighth line of faint, illegible text.

Ninth line of faint, illegible text.

Tenth line of faint, illegible text.

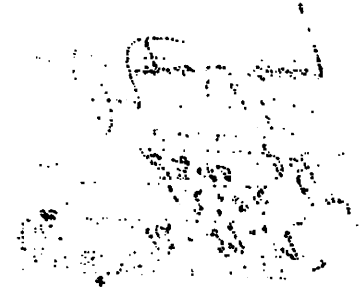


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Twelfth line of faint, illegible text.

Thirteenth line of faint, illegible text.

Fourteenth line of faint, illegible text.



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WHEREAS, Lessee is the successor in interest of ACGP and current lessee under the 1991 Lease; and

WHEREAS, the parties have amended the 1991 Lease by virtue of the Amendment to Lease executed on even date herewith; and

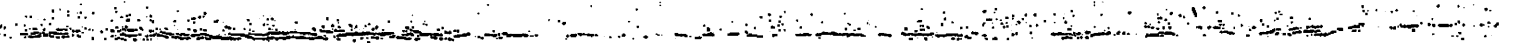
NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties set forth this Memorandum of the 1991 Lease, as amended:

WITNESSETH

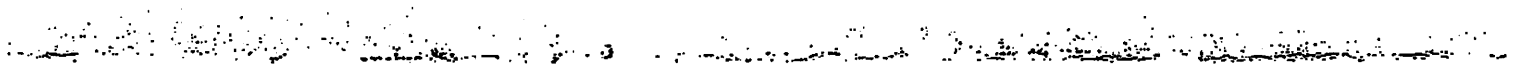
1. **Demised Premises.** For good and valuable consideration, Lessors leased to Lessee, and Lessee has leased from Lessors that certain tract of real estate located in Floyd County, Kentucky, and being a portion of the same land conveyed to Paul D. Gearheart and Linda Gearheart, by Deed dated October 7, 2009, and recorded on October 29, 2009, in the Floyd County Clerk's Office in Deed Book 563, Page 81, and by Deed dated January 17, 2011, and recorded on May 24, 2011, in the Floyd County Clerk's Office in Deed Book 579, Page 47. Said property is further described in the description attached hereto and made a part hereof as **Exhibit A** and the plat attached hereto and made a part hereof as **Exhibit B**, prepared by Steven Haywood, Licensed Professional Land Surveyor (hereinafter referred to as the "**Premises**"). The Lessors have also granted unto Lessee full and complete rights of ingress, egress and regress to and from the Premises over any property owned by Lessors, an easement over property adjacent to the Premises for the placement of guy wires and guy wire anchors, and other associated rights for installation of utilities, maintenance, and other purposes.

2. **Term.** The current term of the 1991 Lease, as amended, shall continue for a period of five (5) years from the Effective Date of this Amendment set forth above.

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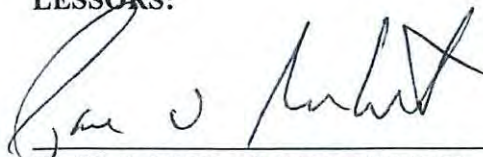
3. **Renewals.** The 1991 Lease, as amended, shall automatically renew for an additional seven (7) terms of five (5) years each, unless Lessee provides sixty (60) days written notice prior to the end of the current term that it does not wish to renew.

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

5. **Purpose.** This Memorandum of Amendment to Lease is prepared solely for the purpose of recordation, and is not intended to, nor shall it be deemed to, modify any of the terms and conditions set forth in the 1991 Lease, as amended, nor to construe any of the rights, duties or responsibilities of Lessors and Lessee. In the event of any conflict between the terms and conditions of this Memorandum and the terms and conditions of the 1991 Lease, as amended, the terms and conditions of the 1991 Lease, as amended, shall supersede and control.

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

LESSORS:



PAUL DOUGLAS GEARHEART



LINDA GEARHEART

COMMONWEALTH OF KENTUCKY
COUNTY OF Pike

The foregoing instrument was acknowledged before me on this 20 day of December, 2017, by Paul Douglas Gearheart and Linda Gearheart, Lessors.

Maury Marie Sanders
Notary Public

My Commission Expires 12-29-2018

LESSEE:

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

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

COMMONWEALTH OF KENTUCKY
COUNTY OF Floyd

The foregoing instrument was acknowledged before me on this 21st day of December, 2017, by W.A. Gillum, CEO/General Manager of East Kentucky Network, LLC d/b/a Appalachian Wireless, Lessee.

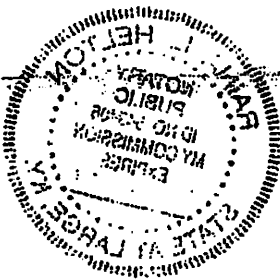
Raina L. Helton
Notary Public

My Commission Expires Feb 16, 2020



This instrument was prepared by:

Cindy D. McCarty
Cindy D. McCarty, Attorney
101 Technology Trail
Ivel, Kentucky 41642
(606) 339-1006





East Kentucky Network
Lease Description
Portion of the Paul D. Gearheart property

The tract of land shown hereon lies on the ridge between the Levisa Fork of the Big Sandy River and Gearheart Branch of Toler Creek of Big Mud Creek of the Levisa Fork of the Big Sandy River near Boldman in Floyd County, Kentucky and more particularly described as follows.

Unless stated otherwise any monument referred to herein as a Re-Bar and Cap is a set 1/2" steel re-bar eighteen (18") in length with a yellow plastic cap stamped Summit L.S. #2661. All bearings stated herein are referred to Grid North based on NAD83 Kentucky Single Zone State Plane Coordinates.

Beginning at a set Re-bar and Cap being 10.32' north west of the approximate center of the ridge and having NAD 83 Kentucky Single Zone Coordinates of N:3,728,267.64 E:5,826,508.67. Thence, S 25°24'30" W a distance of 100.00' to a set Re-Bar and Cap; Thence, down the hill N 64°35'31" W a distance of 100.00' to a Set Re-Bar and Cap; Thence, around the hill N 25°24'35" E a distance of 100.00' to a set Re-Bar and Cap; Thence, up the hill S 64°35'40" E a distance of 99.99' to the point of beginning and containing 0.23 acres more or less according to a survey conducted by persons under the direct supervision of Steven E. Haywood, PLS with Summit Engineering, Inc. on November 15th, 2017 and being a portion of the same property conveyed to Paul D. Gearheart and Linda Gearheart, his wife, by deed from Paul D. Gearheart by deed dated October 7th, 2009 and recorded in the records of the Floyd County Court Clerk's office in Deed Book 563 Page 81.

Steven E. Haywood, PLS #2661

Date: 11/17/2017



STATE OF KENTUCKY, COUNTY OF FLOYD, U.S.
I, CHRIS WAUGH, Clerk of Floyd County, Certify that the foregoing Memorandum Amendment To Lease was on the 29th day of Dec, 2017 at 12:00 o'clock P. m. lodged for record whereupon the same with the foregoing and this certificate have been duly recorded in my office.
Witness my hand this 29th day of Dec, 2017.
CHRIS WAUGH, CLERK by Mary Ann Henry D.C.



The tract of land shown hereon lies on the ridge between the Levisa Fork of the Big Sandy River and Gearheart Branch of Toler Creek of Big Mud Creek of the Levisa Fork of the Big Sandy River near Boldman, Floyd County, Kentucky

Adjoining property owners information provided by the Floyd County, Kentucky PVA office on November 9th, 2017.



Vicinity Map
Not to Scale
Harold and Broad Bottom
7 1/2" Quadrangle Maps

Grid North
KY Single Zone
NAD83

Existing Tower Location:
LAT: 37°31'13.4783"
LON: 82°37'41.0254"
N: 3,728,210.04
E: 5,826,468.44
EL: 1,444.34+/-

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

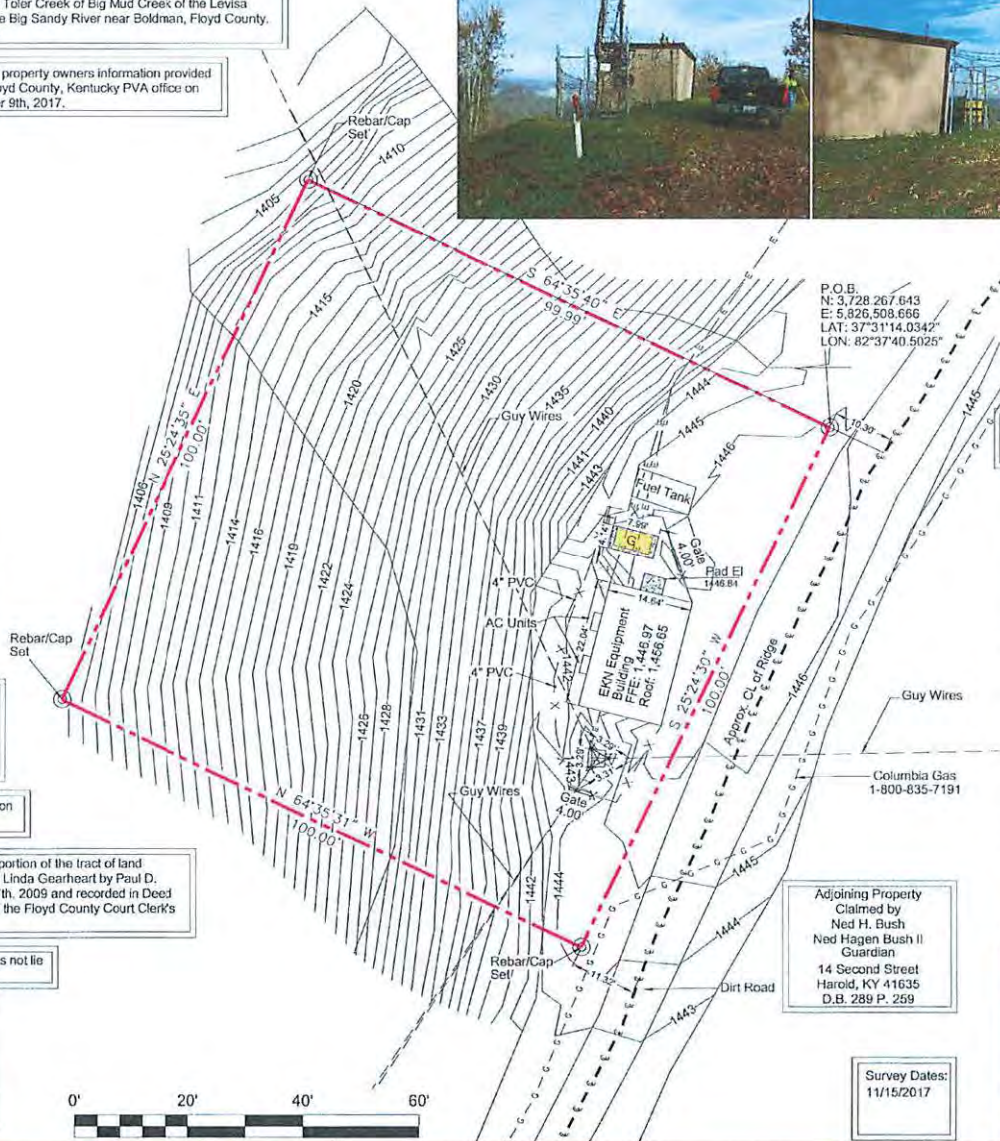
Surveyor
Steven E. Haywood, PLS #2661
Summit Engineering, Inc.
265 Hambley Boulevard
Pikeville, KY 41501
606-432-1447

Contours shown hereon are based on
Survey Data

The tract of land shown hereon is a portion of the tract of land conveyed to Paul D. Gearheart and Linda Gearheart by Paul D. Gearheart by deed dated October 7th, 2009 and recorded in Deed Book 563 Page 81 in the records of the Floyd County Court Clerk's office.

The tract of land shown hereon does not lie within a Flood Hazard Area.

Flood Hazard Information:
The tract of land shown hereon does not lie within the 100 year flood hazard area.
FIRM Panel 220 of 395
Map Number 21071C0220E
Map Revised: Sept. 16, 2015
Floyd County, Kentucky



P.O.B
N: 3,728,267.643
E: 5,826,508.666
LAT: 37°31'14.0342"
LON: 82°37'40.5025"

Area of tract of land shown hereon:
9,999.4 sq. ft.
0.23 Acres +/-

Property Owner
Deed and PVA Information
Paul D. Gearheart
P.O. Box 401
Harold, KY 41635
Deed Book 563 Page 81
PVA #107-00-00-002.00

Note:
Control Building Constructed with
Concrete Blocks

Legend

- 1/2" re-bar set with a plastic cap
- Stamped Summit Engineering, L.S. #2661 Unless otherwise noted.
- Monument - Found - Type Noted
- Utility Pole
- Lease Line
- Electric & Phone Line
- Gas Line
- Chain Link Fence
- Approx. CL of Ridge
- Concrete
- Generator

SURVEYOR'S STATEMENTS

1. The survey shown hereon was conducted under my direct supervision.
2. The method used was random traverse with sideshots.
3. The mathematical error of closure was 1:217,280.
4. The bearings and distances were not adjusted for closure.
5. The basis for the bearings Grid North, NAD83 KY Single Zone
6. This is a rural survey.
7. This plat of survey represents a Boundary Survey and complies with 201 KAR 18:150.

Signature of Steven E. Haywood
Steven E. Haywood PLS No. 2661

Signature of Steve Haywood
Steve Haywood 2661
Date: 11-17-17

STATE OF KENTUCKY
STEVE HAYWOOD
2661
LICENSED PROFESSIONAL LAND SURVEYOR

EAST KENTUCKY NETWORK d/b/a Appalachian Wireless 101 Technology trail, Ivel, KY 41642			
Plat Map Existing Boldman Tower Site Part of the Paul D. Gearheart property located near Boldman Floyd County, Kentucky			
Scale: 1"=20'	Drawn By: SEH/DLM	Chk By: SEH	Apprvd. By: SEH
Plot Date: 17 NOVEMBER 2017 - 11:06 AM	PER. NO:		ATT:
File Name: Z:\East Ky Network\Boldman\EN111517.dwg			

SUMMIT ENGINEERING, INC.
265 HAMBLEY BLVD
PO BOX 3007
PIKEVILLE, KY 41502
606-432-1447

PIKEVILLE, LEICESTER, HENDERSON, KY
SOUTH DARMSTADT, WV



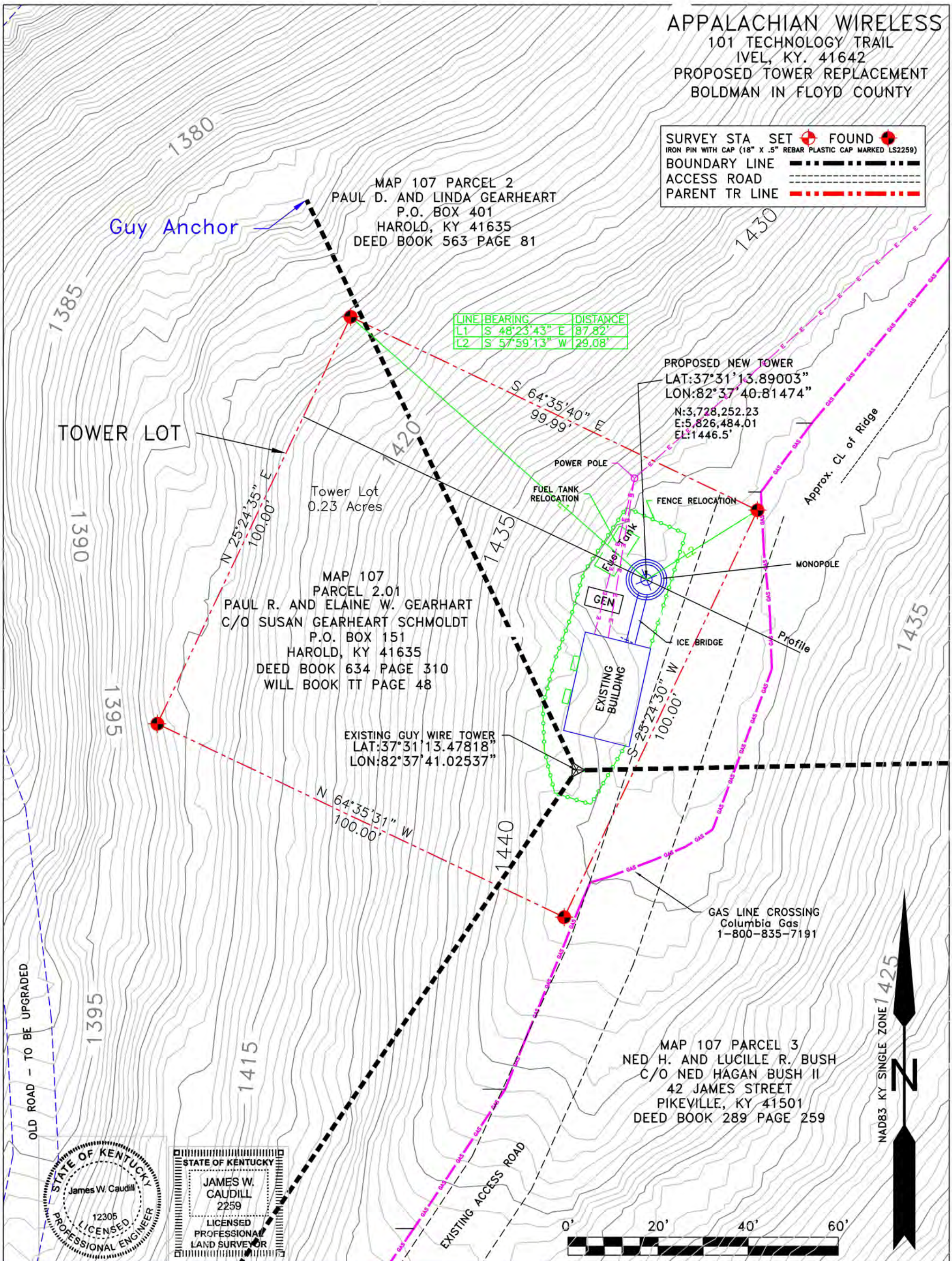
Survey Dates:
11/15/2017

Exhibit 9

APPALACHIAN WIRELESS

101 TECHNOLOGY TRAIL
 IVEL, KY. 41642
 PROPOSED TOWER REPLACEMENT
 BOLDMAN IN FLOYD COUNTY

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



PROPOSED NEW TOWER
 LAT: 37°31'13.89003"N
 LON: 82°37'40.81474"W
 N: 3,728,252.23
 E: 5,826,484.01
 EL: 1446.5'

EXISTING GUY WIRE TOWER
 LAT: 37°31'13.47818"N
 LON: 82°37'41.02537"W

MAP 107 PARCEL 3
 NED H. AND LUCILLE R. BUSH
 C/O NED HAGAN BUSH II
 42 JAMES STREET
 PIKEVILLE, KY 41501
 DEED BOOK 289 PAGE 259

MAP 107 PARCEL 2.01
 PAUL R. AND ELAINE W. GEARHART
 C/O SUSAN GEARHART SCHMOLDT
 P.O. BOX 151
 HAROLD, KY 41635
 DEED BOOK 634 PAGE 310
 WILL BOOK TT PAGE 48

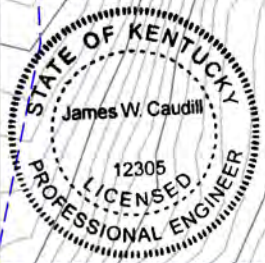
MAP 107 PARCEL 2
 PAUL D. AND LINDA GEARHEART
 P.O. BOX 401
 HAROLD, KY 41635
 DEED BOOK 563 PAGE 81

Guy Anchor

TOWER LOT

Tower Lot
 0.23 Acres

OLD ROAD - TO BE UPGRADED



-THE PROPOSED TOWER HAS BEEN LOCATED USING DUAL FREQUENCY GPS UNIT PROCESSED BY "OPUS"
 -STATE PLANE COORDINATES NAD 83 KY SINGLE ZONE N:3728252.23, E:5826484.01, EL 1446' EXISTING GRD TOP OF PROPOSED FOUNDATION EL 1446.5'-TOP TOWER EL 1686.5'
 -PRECISION: HORIZONTAL=0.30' VERTICAL=0.50'
 -THIS SURVEY MEETS OBSTACLE ACCURACY CODE 2C.
 -PROPERTY LINE INFORMATION TAKEN FROM DEEDS

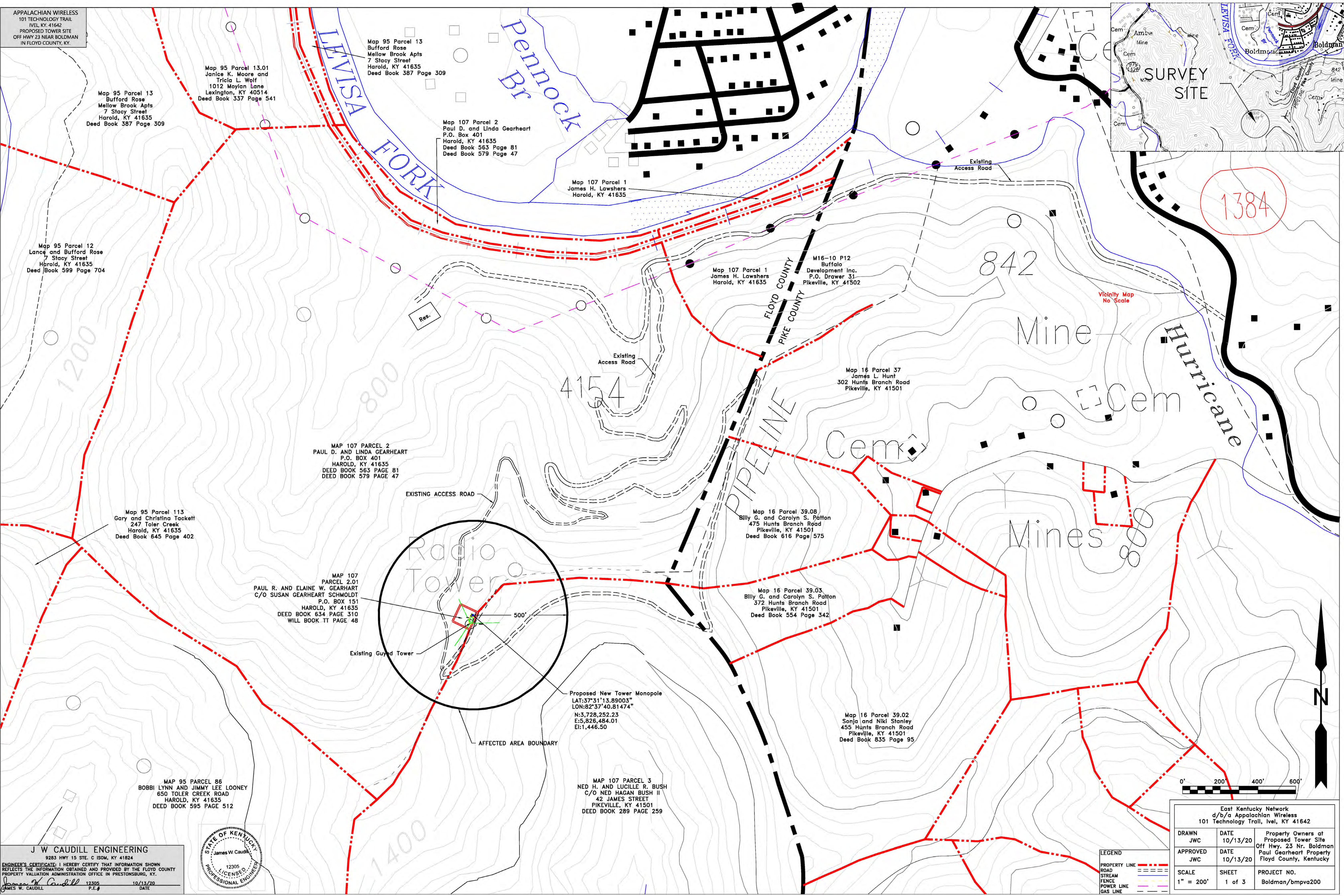
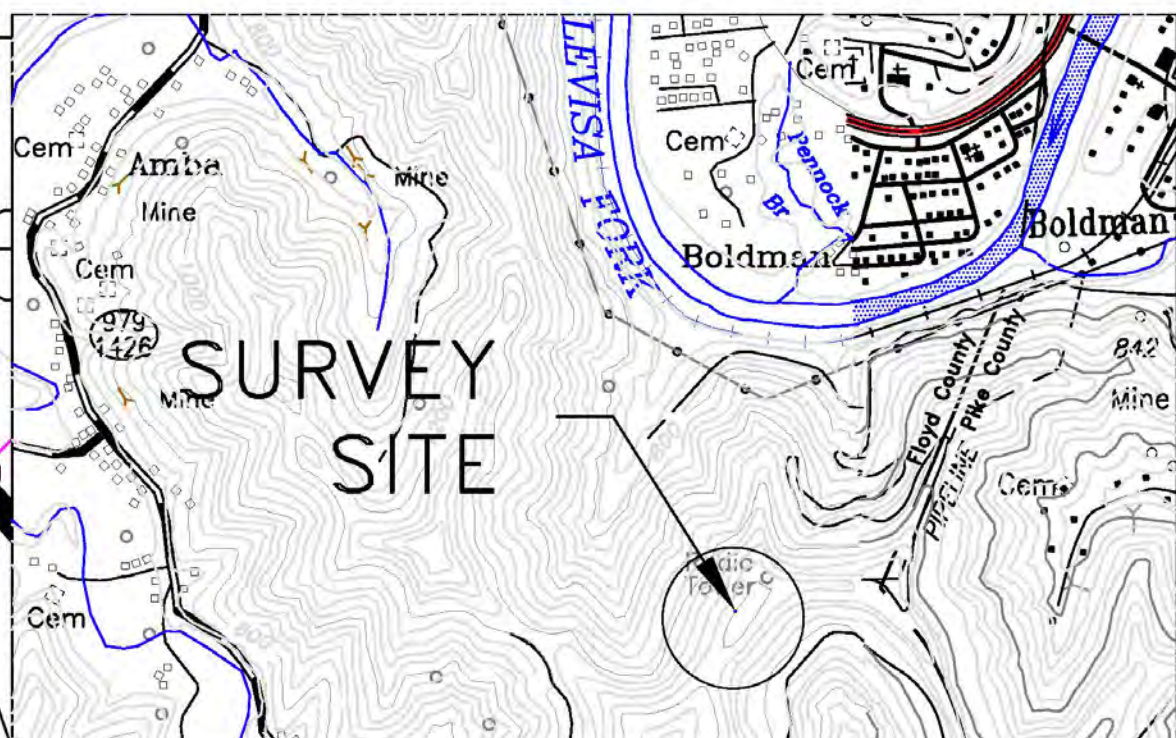
"I certify that the latitude 37°31'13.89003"N and longitude 82°37'40.81474"W are within +/- 50 feet horizontally; and the site elevation 1446.5 ft. MSL, is within +/- 20 feet vertically. With a structure height of 240 ft AGL, the overall height is 1686.5 ft, AMSL. The horizontal datum (coordinates) is in terms of the North American Datum Of 1983 (NAD 83). The vertical datum heights are in terms of the North American Vertical Datum of 1988, and are determined to the nearest foot."

SIGNED: *James W. Caudill* 12305/2259 10/13/2020
 PRINTED: JAMES W. CAUDILL PE #12305 & LS #2259 DATE

East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 10/13/20	Proposed Site Plan and Structure Location Boldman Tower Replacement Guyed Tower to 240' Monopole GEARHEART PROPERTY NEAR BOLDMAN, KY
APPROVED	DATE	
SCALE 1" = 20'	SHEET 2 OF 3	PROJECT NO. BOLDMAN/BOLDMAN_2C_20

Exhibit 10

APPALACHIAN WIRELESS
101 TECHNOLOGY TRAIL
IVEL, KY 41642
PROPOSED TOWER SITE
OFF HWY 23 NEAR BOLDMAN
IN FLOYD COUNTY, KY.

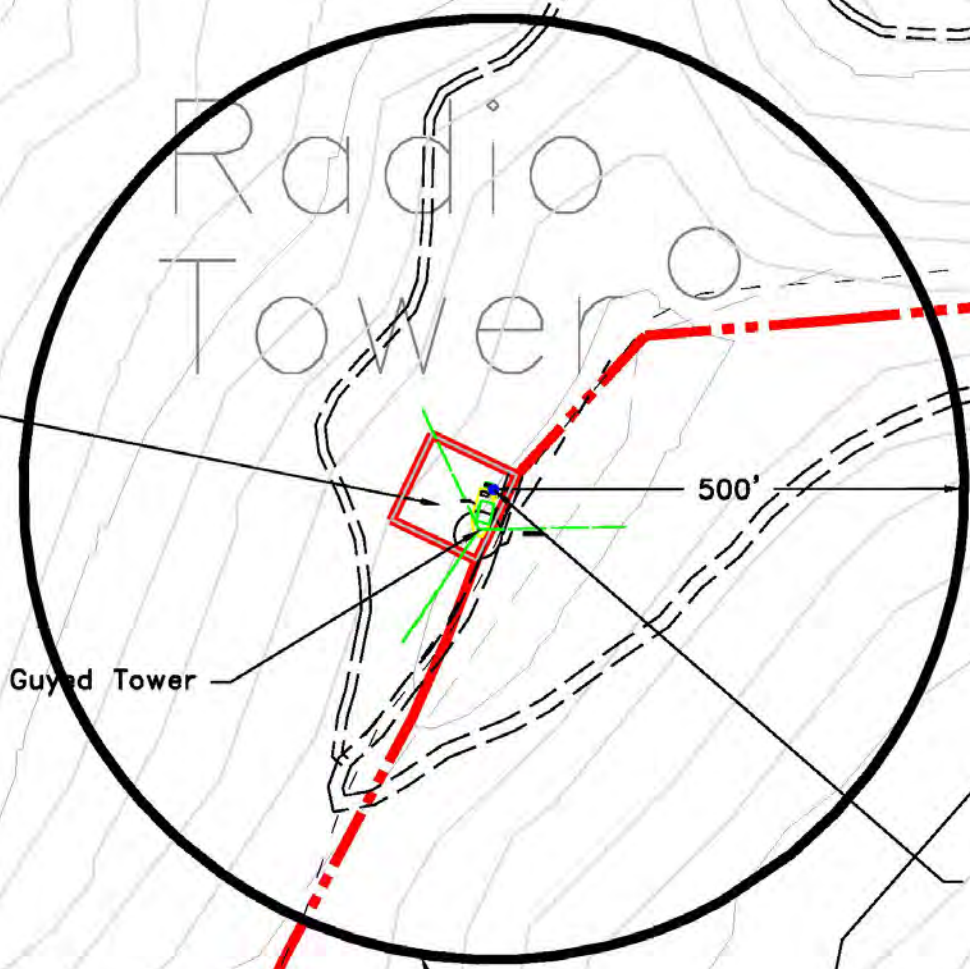


1384

842

4154

800



Proposed New Tower Monopole
LAT: 37°31'13.89003"
LON: 82°37'40.81474"
N: 3,728,252.23
E: 5,826,484.01
Ei: 1,446.50

MAP 107 PARCEL 3
NED H. AND LUCILLE R. BUSH
C/O NED HAGAN BUSH II
42 JAMES STREET
PIKEVILLE, KY 41501
DEED BOOK 289 PAGE 259

Map 16 Parcel 39.02
Sanja and Niki Stanley
455 Hunts Branch Road
Pikeville, KY 41501
Deed Book 835 Page 95

Map 16 Parcel 39.03
Billy G. and Carolyn S. Patton
372 Hunts Branch Road
Pikeville, KY 41501
Deed Book 554 Page 342

Map 16 Parcel 39.08
Billy G. and Carolyn S. Patton
475 Hunts Branch Road
Pikeville, KY 41501
Deed Book 616 Page 575

Map 16 Parcel 37
James L. Hunt
302 Hunts Branch Road
Pikeville, KY 41501

Map 107 Parcel 1
James H. Lawshers
Harold, KY 41635

M16-10 P12
Buffalo
Development Inc.
P.O. Drawer 31
Pikeville, KY 41502

Map 107 Parcel 1
James H. Lawshers
Harold, KY 41635

Map 107 Parcel 2
Paul D. and Linda Gearheart
P.O. Box 401
Harold, KY 41635
Deed Book 563 Page 81
Deed Book 579 Page 47

Map 95 Parcel 13
Bufford Rose
Mellow Brook Apts
7 Stacy Street
Harold, KY 41635
Deed Book 387 Page 309

Map 95 Parcel 13.01
Janice K. Moore and
Tricia L. Wolf
1012 Maylan Lane
Lexington, KY 40514
Deed Book 337 Page 541

Map 95 Parcel 13
Bufford Rose
Mellow Brook Apts
7 Stacy Street
Harold, KY 41635
Deed Book 387 Page 309

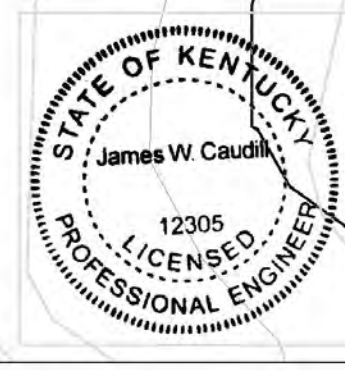
Map 95 Parcel 12
Lance and Bufford Rose
7 Stacy Street
Harold, KY 41635
Deed Book 599 Page 704

Map 95 Parcel 113
Gary and Christina Tackett
247 Toler Creek
Harold, KY 41635
Deed Book 645 Page 402

MAP 107 PARCEL 2.01
PAUL R. AND ELAINE W. GEARHART
C/O SUSAN GEARHEART SCHMOLDT
P.O. BOX 151
HAROLD, KY 41635
DEED BOOK 634 PAGE 310
WILL BOOK TT PAGE 48

MAP 95 PARCEL 86
BOBBI LYNN AND JIMMY LEE LOONEY
650 TOLER CREEK ROAD
HAROLD, KY 41635
DEED BOOK 595 PAGE 512

J W CAUDILL ENGINEERING
9283 HWY 15 STE. C ISOM, KY 41824
ENGINEER'S CERTIFICATE: I HEREBY CERTIFY THAT INFORMATION SHOWN
REFLECTS THE INFORMATION OBTAINED AND PROVIDED BY THE FLOYD COUNTY
PROPERTY VALUATION ADMINISTRATION OFFICE IN PRESTONSBURG, KY.
James W. Caudill 12305 10/13/20
JAMES W. CAUDILL P.E.# DATE



LEGEND

- PROPERTY LINE
- ROAD
- STREAM
- FENCE
- POWER LINE
- GAS LINE



East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 10/13/20	Property Owners at Proposed Tower Site Off Hwy. 23 Nr. Boldman Paul Gearheart Property Floyd County, Kentucky
APPROVED JWC	DATE 10/13/20	
SCALE 1" = 200'	SHEET 1 of 3	PROJECT NO. Boldman/bmpva200

Exhibit 11

APPALACHIAN WIRELESS
 101 TECHNOLOGY TRAIL
 IVEL, KY. 41642
 PROPOSED TOWER REPLACEMENT
 BOLDMAN IN FLOYD COUNTY

PROFILE WITH TOWER

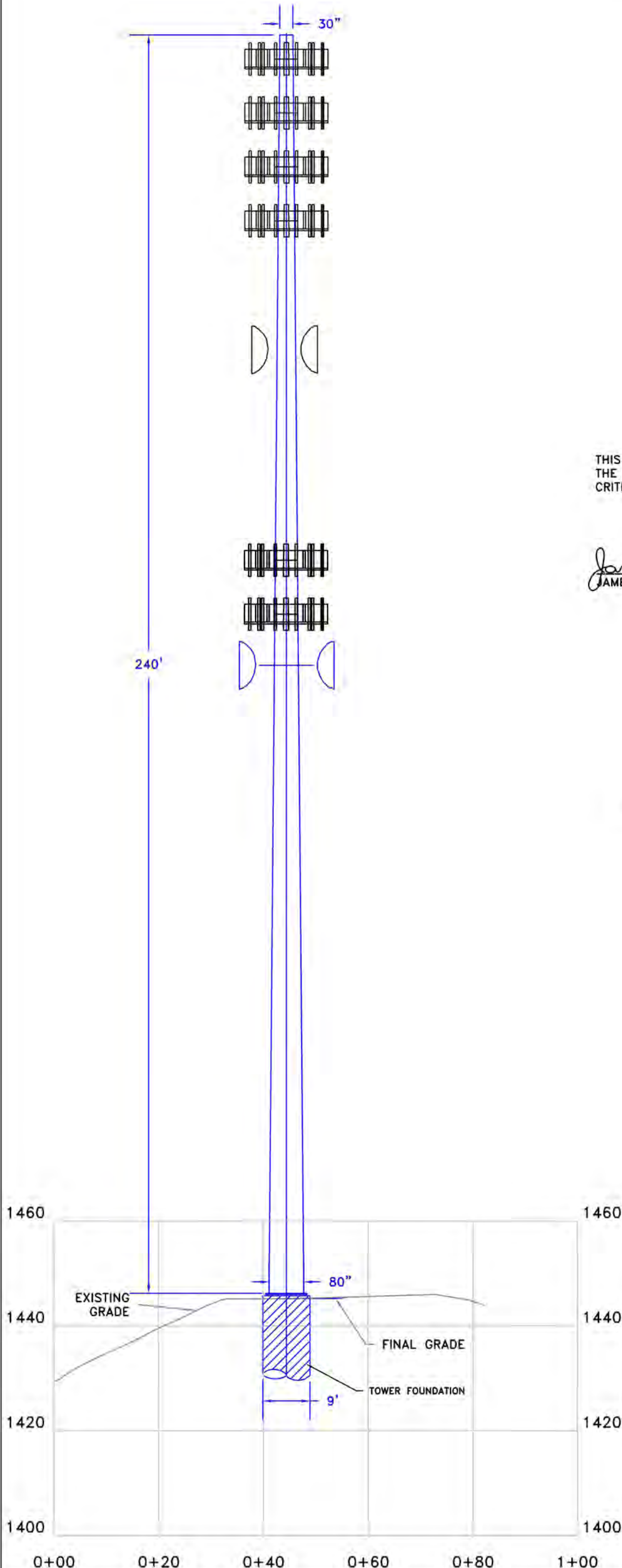
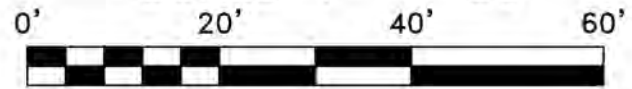
THIS IS A VERTICAL PROFILE SKETCH OF THE TOWER INDICATING THE PROPOSED ANTENNA AND DISH ELEVATIONS. NO DESIGN CRITERIA WAS CONSIDERED IN THE PREPARATION OF THIS DRAWING.

James W. Caudill 12305 10/13/2020
 JAMES W. CAUDILL PE #. DATE

NOTE: SEE FOUNDATION DRAWINGS FOR DETAILS

10/13/20

SCALE 1" = 20'



East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 10/13/20	Proposed Site Plan and Structure Location Boldman Tower Replacement Guyed Tower to 240' Monopole GEARHEART PROPERTY NEAR BOLDMAN, KY
APPROVED	DATE	
SCALE 1" = 20'	SHEET 3 OF 3	PROJECT NO. BOLDMAN/BOLDMAN_PRO_20

Exhibit 12

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

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

Exhibit 13

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

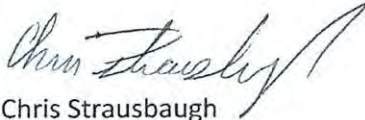
Kentucky Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, KY 40602-0615

Dear Commissioners:

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

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

Thank you,



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