

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

In the matter of:

THE APPLICATION OF EAST KENTUCKY NETWORK,)
LLC FOR THE ISSUANCE OF A CERTIFICATE OF)
PUBLIC CONVENIENCE AND NECESSITY TO) CASE NO 2021-00043
CONSTRUCT A REPLACEMENT TOWER IN ELLIOTT)
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 Elliott 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 180-foot telecommunications tower on a tract of land located at 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky (38°04'10.44"N 83°04'35.70"W). A map and detailed directions to the site can be found in Exhibit 7.

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

Exhibit 2 is a list of all Property owners or residents 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 records.

Pursuant to 807 KAR 5:063 Section 1(1)(L), Section 1(1)(m), and Section 2, all affected property owners according to the Property Valuation Administrator's record who reside or own property within 500 feet of the proposed Tower or who own property 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.

Elliott County has no formal local planning unit. In absence of this unit, the Elliott County Judge Executive's office was notified by certified mail, return receipt requested of East Kentucky Network, LLC's proposal and informed of its right to intervene. The Elliott 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 Elliott County News, February 12, 2021 edition. Enclosed in Exhibit 3 is a copy of that notice. The Elliott County News is the newspaper with the largest circulation in Elliott 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, LLC 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 applications 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 February 4, 2021, and will remain posted for at least two weeks after filing of this application as specified.

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

The proposed construction site is on a rugged mountaintop in close proximity to the existing tower. There is an existing 180' self-supporting tower owned by 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, and 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 at 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: 2/9/2021
Lynn Haney, Regulatory Compliance Director

APPROVED BY: W.A. Gillum DATE: 2/10/2021
W.A. Gillum, General Manager

ATTORNEY: Krystal Branham DATE: 2/9/2021
Hon. Krystal Branham, Attorney

CONTACT INFORMATION:

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

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

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

Mailing Address:

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

1	FCC License
2	Copies of Cell Site Notice to Land Owners
3	Notifications of County Judge Executive and Newspaper
4	Universal Soil Bearing Analysis
5	Tower Design
6	FAA and KAZC Applications
7	Driving Directions from County Court House and Map to Suitable Scale
8	Deed 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

Daniel and Cory Nuetzmann
4608 S 600 West
Trafalgar, IN 46181

Roger and Ithel
4806 Shaker Road
Franklin, OH 45005

Tracy and Sandra Kitchen
2801 S KY 32
Sandy Hook, KY 41171

Mary Kelly Barnett Wagoner
145 White Oak
Sandy Hook, KY 41171



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

February 12, 2021

Daniel and Cory Nuetzmann
4608 S 600 West
Trafalgar, IN 46181

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00043)

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 Elliott County. The facility will include a 180-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land near 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00043 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,

A handwritten signature in blue ink that reads "Lynn Haney".

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

February 12, 2021

Roger and Ithel
4806 Shaker Road
Franklin, OH 45005

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00043)

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 Elliott County. The facility will include a 180-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land near 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00043 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,

A handwritten signature in blue ink that reads "Lynn Haney".

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1



VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

February 12, 2021

Tracy and Sandra Kitchen
2801 S KY 32
Sandy Hook, KY 41171

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00043)

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 Elliott County. The facility will include a 180-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land near 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00043 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,

A handwritten signature in blue ink that reads "Lynn Haney".

Lynn Haney, CPA
Regulatory Compliance Director
Enclosure 1

VIA: U.S. CERTIFIED MAIL

PUBLIC NOTICE

February 12, 2021

Mary Kelly Barnett Wagoner
145 White Oak
Sandy Hook, KY 41171

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00043)

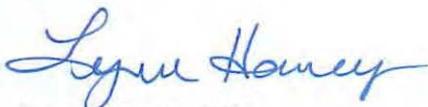
East Kentucky Network, LLC d/b/a Appalachian Wireless has applied to the Public Service Commission of Kentucky for a Certificate of Public Convenience and Necessity to construct and operate a new facility to provide cellular telecommunications service in Elliott County. The facility will include a 180-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land near 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you may own property within a 500' radius of the proposed tower or own property contiguous to the property upon which construction is proposed.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00043 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

Isonville Replacement

Location:

810 Sandy Hook Tower Road
Sandy Hook, Kentucky 41171

Coordinates:

38° 04' 10.44" N
83° 04' 35.70" W

Proposed Isonville Tower



Rice Hollow Rd

1621
32

Brier Fork Rd

Google Earth

© 2021 Google



2000 ft

EXHIBIT 3

VIA: U.S. CERTIFIED MAIL

February 12, 2021

Myron Lewis, Judge Executive
P.O. Box 710
Sandy Hook, KY 41171

RE: Public Notice-Public Service Commission of Kentucky (Case No. 2021-00043)

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 replacement facility to provide cellular telecommunications service in Elliott County. The facility will include a 180-foot monopole tower with attached antennas extending upwards, and an equipment shelter located on a tract of land at 810 Sandy Hook Tower Road, Sandy Hook, Elliott County, Kentucky. A map showing the location of the proposed new facility is enclosed. This notice is being sent to you because you are the County Judge Executive of Elliott County.

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

Your comments and request for intervention should be addressed to: Executive Director's Office, Public Service Commission of Kentucky, P.O. Box 615, Frankfort, KY 40602. Please refer to Case No. 2021-00043 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

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

EAST KENTUCKY
NETWORK



To: The Elliott County News
Attn: Classifieds

From: Raina Helton
Regulatory Compliance Assistant

Email: courier@mrtc.com
Date: February 2, 2021

Re: PUBLIC NOTICE ADVERTISEMENT
Pages: 1

Please place the following Public Notice Advertisement in The Elliott County News to be ran on February 12, 2021.

PUBLIC NOTICE:

RE: Public Service Commission of Kentucky (CASE NO. 2021-00043)

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 810 Sandy Hook Tower Road, Sandy Hook Elliott County, Kentucky. The proposed tower will be a 180 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. 2021-00043.

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.

Isonville Replacement

Location:

810 Sandy Hook Tower Road
Sandy Hook, Kentucky 41171

Coordinates:

38° 04' 10.44" N
83° 04' 35.70" W

Proposed Isonville Tower



Rice Hollow Rd

1621
32

Brier Fork Rd

Google Earth

© 2021 Google



2000 ft

EXHIBIT 4



230 Swartz Drive • Hazard • Kentucky • 41701

Phone (606) 551-1050

EAST KENTUCKY ENGINEERING, LLC.

**APPALACHIAN WIRELESS
Geotechnical Investigation on the
Isonville Tower Site
Elliott County, Kentucky
EKYENG Project No. 165-000-0119**

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



_____, 2015, January 11th, 2021



EAST KENTUCKY ENGINEERING, LLC.

EXECUTIVE SUMMARY

- 1.0 INTRODUCTION**
- 2.0 PROJECT DESCRIPTION**
- 3.0 SITE DESCRIPTION & HISTORICAL MINING**
 - 3.1 GENERAL INFORMATION
 - 3.2 SURFACE MINING
 - 3.3 UNDERGROUND MINING
 - 3.4 FLOOD HAZARD
- 4.0 FIELD EXPLORATION**
 - 4.1 SITE INFORMATION
 - 4.2 BORING DATA
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 - 4.4 SEISMIC SITE CLASSIFICATION
- 5.0 DISCUSSION AND RECOMMENDATIONS**
 - 5.1 GENERAL
 - 5.2 DRILLED PIERS FOUNDATION RECOMMENDATIONS
 - 5.3 BURIED UTILITIES
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 - 6.1 SUBSURFACE EXPLORATION
 - 6.2 LABORATORY AND FIELD TEST
 - 6.3 ANALYSIS AND RECOMMENDATIONS
 - 6.4 CONSTRUCTION MONITORING
 - 6.5 GENERAL

SPECIFICATIONS

- I – GENERAL**
- 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**



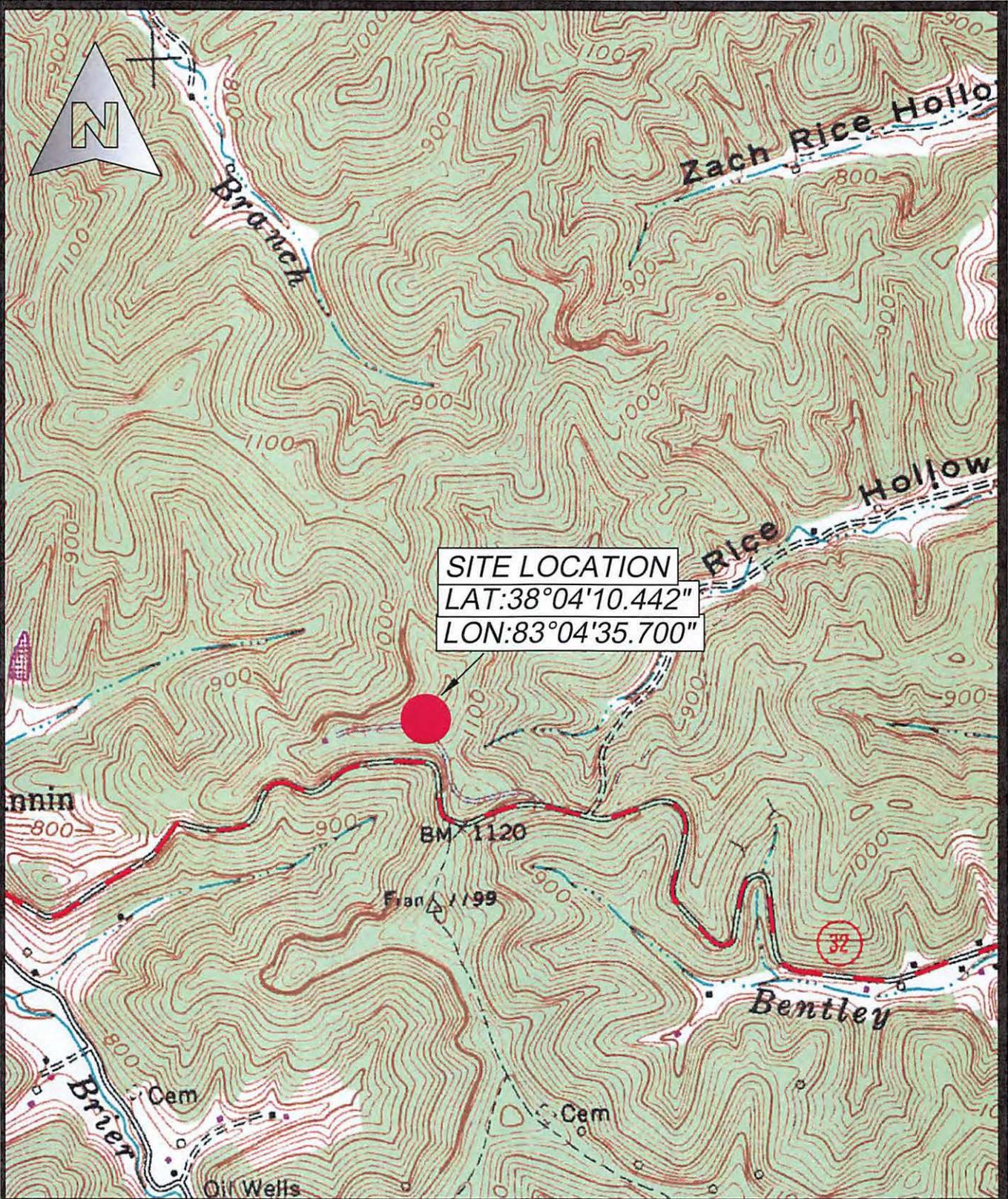
EAST KENTUCKY ENGINEERING, LLC.

EXECUTIVE SUMMARY

A geotechnical investigation has been performed on the Isonville Tower Site, located in Elliott 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 38.5 ft. The following geotechnical considerations were identified:

- Borings utilized for this study encountered silty clay to 3.5 ft, gray and white weathered shale to 5.5 ft, brown weathered shale to 7.5 ft, brown and red sandstone to 31.2 ft., gray shale to 31.6 ft., brown sandstone to 36.5 ft., and gray shale to 38.5 ft.
- This site is on a ridgeline adjacent to an existing tower.
- **The allowable bearing capacities of the brown & red sandstone is estimated at 8 tsf from 1061.0 ft to 1042.0 ft. Additional information on the bearing capacities is included in Section 5.2 of this report.**
- **The 2018 Kentucky Building Codes seismic site classification for this site is "A".**
- If during the foundation design it becomes necessary to lower, raise, or change the footer configuration, alternate design recommendations can be provided by EKYENG.
- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We, therefore, recommend that EKYENG is retained to monitor this portion of the work.

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



SITE LOCATION
 LAT: 38°04'10.442"
 LON: 83°04'35.700"

Drawn: RDS	Date: 1/18/21
Job: 165-119	Scale: 1"=1000'

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

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



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 Isonville Property, in Elliott County, Kentucky. A site location map is shown in Figure No. 1.

One (1) boring was advanced to a maximum depth of 38.5 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 an 8 ft diameter pier, with a base of the tower elevation at 1170.3 ft. 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.



SITE LOCATION
 LAT:38°04'10.442"
 LON:83°04'35.700"

Drawn: RDS	Date: 1/18/21
Job: 165-119	Scale: 1"=1000'

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

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 in Elliott County, Kentucky. The current surface elevation is approximately 1170.3 ft. Research on the historical mining was conducted by obtaining previous mine license maps from the "Kentucky Mine Mapping Information System" (KMMIS).

3.2 SURFACE MINING

Surface mining has been conducted to the north, east and west of the proposed tower site. The nearest disturbance is approximately 550 ft east of the site. We expect no issues from surface mining activities at this site.

3.3 UNDERGROUND MINING

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

3.4 FLOOD HAZARD

A potential flood determination was conducted by EKYENG. For this determination, the FEMA Flood Map Service was reviewed for this location. The flood map for the selected area is number **21063C0180A-210372**. The flood zone for this area is Zone X and is an area of minimal flood hazard. A FIRMette map is included in Appendix E of this report.

4.0 FIELD EXPLORATION

4.1 SITE INFORMATION

The proposed site is located on a ridgeline in Elliott County, Kentucky. The site lies within the Isonville Quadrangle. The site is readily accessible by conventional exploratory equipment. An estimated pad location was determined based on the



EAST KENTUCKY ENGINEERING, LLC.

information provided. Foundation dimensions were estimated to be an 8 ft. diameter circular pier footer for this report.

4.2 BORING DATA

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

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

SAMPLE NO.	DEPTH INCREMENT, (FT.)	NATURAL MOISTURE CONTENT, %
B1 S-1	1.5 – 3.0	13.5%
B1 S-2	4.5 – 5.5	8.1%

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



EAST KENTUCKY ENGINEERING, LLC.

TABLE NO. 3
STANDARD PENETRATIONS

SAMPLE NO.	DEPTH INCREMENT	BLOW COUNT / RQD *	DESCRIPTION
B-1	0.0-0.5		Gravel (fill)
B-1	0.5-3.5	2-5-8	Brown and white silty clay
B-1	3.5-5.5	10-50/5	Gray and white weathered shale
B-1	5.5-7.5	63*	Brown weathered shale
B-1	7.5-31.2	100*	Brown and red sandstone
B-1	31.2-31.6	65*	Gray Shale
B-1	31.6-36.5	65*	Brown sandstone
B-1	36.5-38.5	65*	Gray shale

The boring encountered weathered shale and sandstone. This boring was extended by "NX" size rock core that was taken to confirm the presence of rock at the site and to determine its physical characteristics. The core was made with "NX" size diamond coring equipment. This boring is between 5.5 ft and 38.5 ft in depth. The position at which the core was taken is indicated on the boring log and shown on the boring location map in Appendix D.

4.3 GROUNDWATER

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

4.4 SEISMIC SITE CLASSIFICATION

Based on the encountered soil conditions at the project site, the site classification was determined to be "Site Class A" per the 2018 Kentucky Building Code. In



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In addition, an S_{DS} coefficient of 0.094 was calculated, and an S_{D1} coefficient of 0.043 g was also calculated for design based on the aforementioned building code.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 GENERAL

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

5.2 DRILLED PIER FOUNDATION RECOMMENDATIONS

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

TABLE NO. 4

Approx. Depth (ft.)	Allowable Skin Friction (psf.)	Allowable End Bearing Pressure (psf.)	Effective Unit Weight (pcf.)	Cohesion (psf.)	Internal Angle of Friction (Degrees)
Brown & White Silty Clays 0.0 – 3.5	Ignored				
Grey & White Weathered Shale 3.5 – 5.5	1200	6,000	150	-----	24
Gray Shale 5.5 – 7.5	1500	6,000	150	-----	27



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Approx. Depth (ft.)	Allowable Skin Friction (psf.)	Allowable End Bearing Pressure (psf.)	Effective Unit Weight (pcf.)	Cohesion (psf.)	Internal Angle of Friction (Degrees)
Brown & Red Sandstone 7.5 – 31.2	2500	16,000	165	-----	35
Grey Shale 31.2 to 31.6	1500	8,000	150	-----	27
Brown Sandstone 31.6 – 36.5	2500	13,000	165	-----	32
Gray 36.5 – 38.5	1500	8,000	150		27

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

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



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

5.3 BURIED UTILITIES

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



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6.0 WARRANTY

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

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

6.1 SUBSURFACE EXPLORATION

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

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



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

6.2 LABORATORY AND FIELD TESTS

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

6.3 ANALYSIS AND RECOMMENDATIONS

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

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

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



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6.4 CONSTRUCTION MONITORING

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

6.5 GENERAL

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

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

This report has been prepared for the exclusive use of Appalachian Wireless, for specific application to the proposed cellular tower located on the Isonville Property located in Elliott 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



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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.



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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, or as directed by the Owner or his designated representative if on site disposal is



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provided. In no case shall such objectionable material be allowed in or under the fill unless specifically authorized in writing.

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

4.0 FORMATION OF FILL AREAS

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

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

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

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

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



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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 atmospheres or other hazardous conditions. The "competent person" must



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



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

3.0 INSTALLATION OF THE REBAR CAGE

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

4.0 CONCRETING OF THE DRILLED PIER

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



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- 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 grains,



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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.



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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 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.



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- C. Transporting of Concrete from Mixer to Place of Final Deposit: Transportation shall be done as rapidly as practical by means which shall prevent the separation or loss of the ingredients. If chutes are used, they shall be at a slope not flatter than one vertical to two horizontal. Buggies or carts shall be equipped with pneumatic rubber tires or surfaces of runways shall be sufficiently smooth or both so as not to cause separation or segregation of concrete ingredients. Concrete shall not be allowed to drop freely more than 4 feet. Where greater drops are required, canvas "elephant trunks" or galvanized iron chutes equipped with suitable hopper heads shall be employed and a sufficient number placed to ensure that the concrete may be effectively compacted into horizontal layers not exceeding 12 inches in thickness with minimum lateral movements.
- D. Depositing of Concrete: Depositing of concrete shall:
1. Proceed continuously after once starting until reaching the end of a section of construction joint location shown on the drawings, or as approved by the Owner. The operations shall be conducted so that no concrete is deposited on concrete sufficiently hardened to cause formation of seams, and planes of weakness.
 2. Be as near as practical to its final position in the forms.
 3. Proceed to maintain constantly a top surface which is approximately level.
 4. Be placed before initial set has occurred, and in no event after it has contained its water content for more than 90 minutes.
 5. Be thoroughly worked and compacted by means of suitable tools to provide impermeability, durability and strength and shall be thoroughly worked around reinforcements and embedded items and into corners of forms and to be free from voids, pockets or honeycombing. Care shall be taken to provide impermeability.
- E. Vibration Equipment: Vibration equipment shall be of the appropriate type and shall, always, be adequate in number of units and power of each unit to properly consolidate all concrete.
- F. Monolithic Pours: Proper delivery of concrete shall be the Contractor's responsibility to make a mono-lithic pour without delays and changes of cold joints.

9.0 CURING



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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

FIELD BORING LOG

##

1070.35

PF 23.7
23.7



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APPENDIX B CORE PHOTOGRAPHS





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APPENDIX C SEISMIC DATA



Isonville Tower

Latitude, Longitude: 38.06957, -83.07658



Map data ©2021

Date	1/18/2021, 12:51:17 PM
Design Code Reference Document	IBC-2015
Risk Category	IV
Site Class	A - Hard Rock

Type	Value	Description
S _S	0.176	MCE _R ground motion. (for 0.2 second period)
S ₁	0.081	MCE _R ground motion. (for 1.0s period)
S _{MS}	0.141	Site-modified spectral acceleration value
S _{M1}	0.064	Site-modified spectral acceleration value
S _{DS}	0.094	Numeric seismic design value at 0.2 second SA
S _{D1}	0.043	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	0.085	MCE _G peak ground acceleration
F _{PGA}	0.8	Site amplification factor at PGA
PGA _M	0.068	Site modified peak ground acceleration
T _L	12	Long-period transition period in seconds
S _{sRT}	0.176	Probabilistic risk-targeted ground motion. (0.2 second)
S _{sJH}	0.191	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S _{sD}	1.5	Factored deterministic acceleration value. (0.2 second)
S _{1RT}	0.081	Probabilistic risk-targeted ground motion. (1.0 second)
S _{1UH}	0.089	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S _{1D}	0.6	Factored deterministic acceleration value. (1.0 second)
PGA _d	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
C _{RS}	0.922	Mapped value of the risk coefficient at short periods
C _{R1}	0.903	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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EAST KENTUCKY ENGINEERING, LLC.

APPENDIX D PHOTOGRAPHS





EAST KENTUCKY ENGINEERING, LLC.





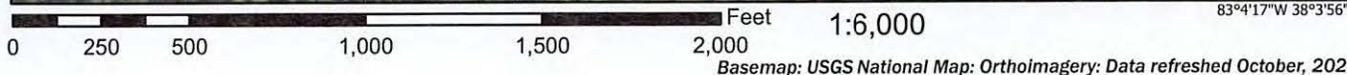
EAST KENTUCKY ENGINEERING, LLC.

**APPENDIX E
MAPS**

National Flood Hazard Layer FIRMette



83°4'55"W 38°4'25"N



Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

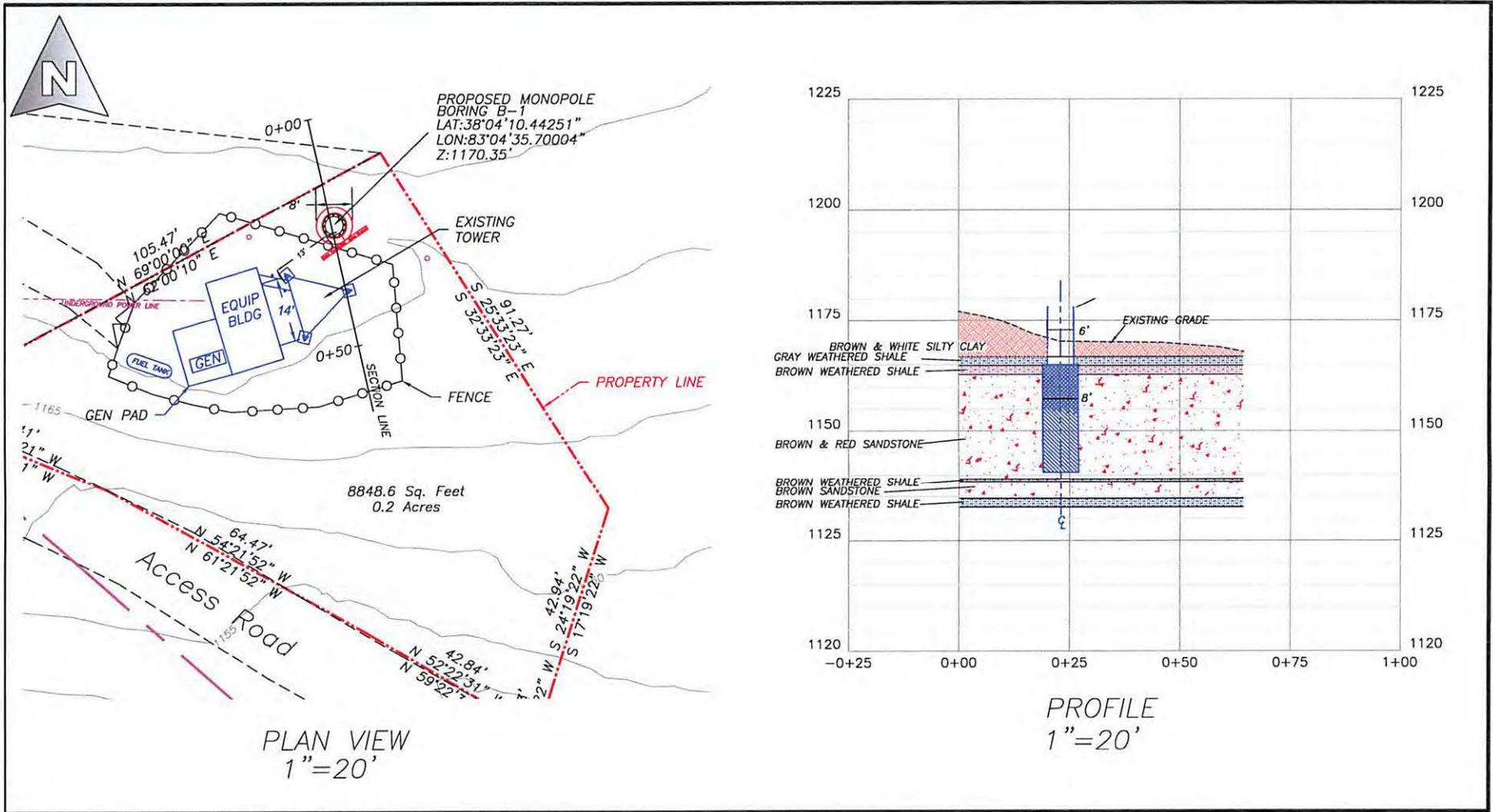
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | |
|------------------------------------|---|
| SPECIAL FLOOD HAZARD AREAS | <ul style="list-style-type: none"> Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | <ul style="list-style-type: none"> 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | <ul style="list-style-type: none"> NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> Effective LOMRs Area of Undetermined Flood Hazard <i>Zone D</i> |
| GENERAL STRUCTURES | <ul style="list-style-type: none"> Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall |
| OTHER FEATURES | <ul style="list-style-type: none"> 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5 Coastal Transect 212 Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature |
| MAP PANELS | <ul style="list-style-type: none"> Digital Data Available No Digital Data Available Unmapped |
-
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **1/11/2021 at 2:11 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



East Kentucky Engineering, LLC

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 Hazard, KY 41701
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 Email: ekyceng@ekyceng.net

Richard D. Smith
 RICHARD D. SMITH
 10215
 LICENSED PROFESSIONAL ENGINEER
 1/16/2021

0' 20' 40'

Drawn by: RDS 1/16/2021

Job #: 165-000-0119 Scale: 1" = AS NOTED

File Location:



APPALACHIAN WIRELESS
 PROPOSED ISONVILLE TOWER LOCATION
 ELLIOTT COUNTY
 KENTUCKY

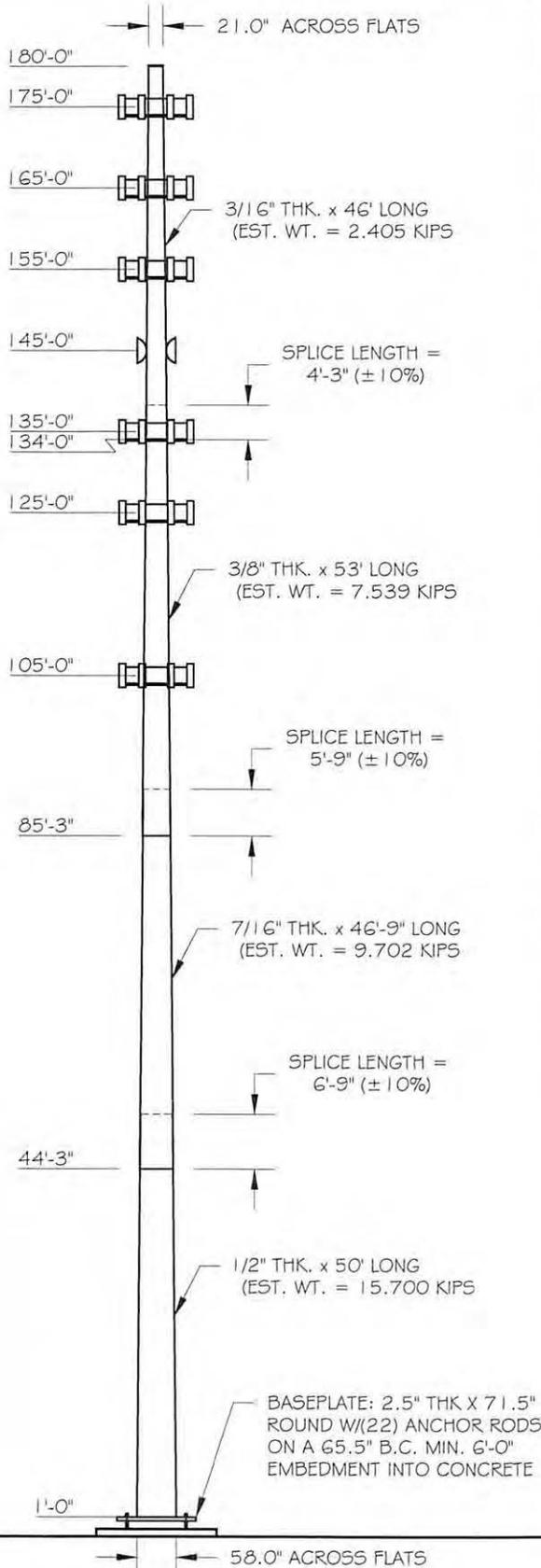
EXHIBIT 5



TAPP

2427 Kelly Lane
Houston, Texas 77066
81-444-8277

QUALITY STEEL POLES. DELIVERED.



Page 1 of 2	Job Number: 23521-001
Eng: MFP	Customer Ref: TP-19560
	Date: 1/18/2021
Structure: 180-FT MONOPOLE	
Site: ISONVILLE	
Location: ELLIOTT CO., KY / 38°4'10.4", -83°4'35.7"	
Owner: APPALACHIAN WIRELESS	
Revision No.:	Revision Date:

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

STRUCTURE MEETS THE MINIMUM REQUIREMENTS OF TIA-222-H

EQUIPMENT LIST	
Elev.	Description
175	(12) NN-G5A-M + (12) RRU
175	12-FT PLATFORM WITH HANDRAIL
165	(12) NN-G5A-M + (12) RRU
165	12-FT PLATFORM WITH HANDRAIL
155	(12) NN-G5A-M + (12) RRU
155	12-FT PLATFORM WITH HANDRAIL
145	(2) HP-4 DISH
145	DUAL MICROWAVE MOUNT
135	(12) NN-G5A-M + (12) RRU
135	12-FT PLATFORM WITH HANDRAIL
125	(12) NN-G5A-M + (12) RRU
125	12-FT PLATFORM WITH HANDRAIL
105	(12) NN-G5A-M + (12) RRU
105	12-FT PLATFORM WITH HANDRAIL

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE

STRUCTURE PROPERTIES					
Cross-Section: 18-Sided			Taper: 0.21788 in/ft		
Shaft Steel: ASTM A572 GR 65			Baseplate Steel: ASTM A572 GR 50		
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0"					
Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	46.00	0.1875	4.25	21.00	31.02
2	53.00	0.3750	5.75	29.72	41.27
3	46.75	0.4375	6.75	39.27	49.45
4	50.00	0.5000	0.00	47.11	58.00



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

BASE REACTIONS FOR FOUNDATION DESIGN

Moment: 7028 ft-kip
Shear: 53 kip
Axial: 77 kip

Page 2 of 2	Job Number: 23521-001
Eng: MFP	Customer Ref: TP-19560
	Date: 1/18/2021
Structure: 180-FT MONOPOLE	
Site: ISONVILLE	
Location: ELLIOTT CO., KY / 38°4'10.4", -83°4'35.7"	
Owner: APPALACHIAN WIRELESS	
Revision No.:	Revision Date:

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45. 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.

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

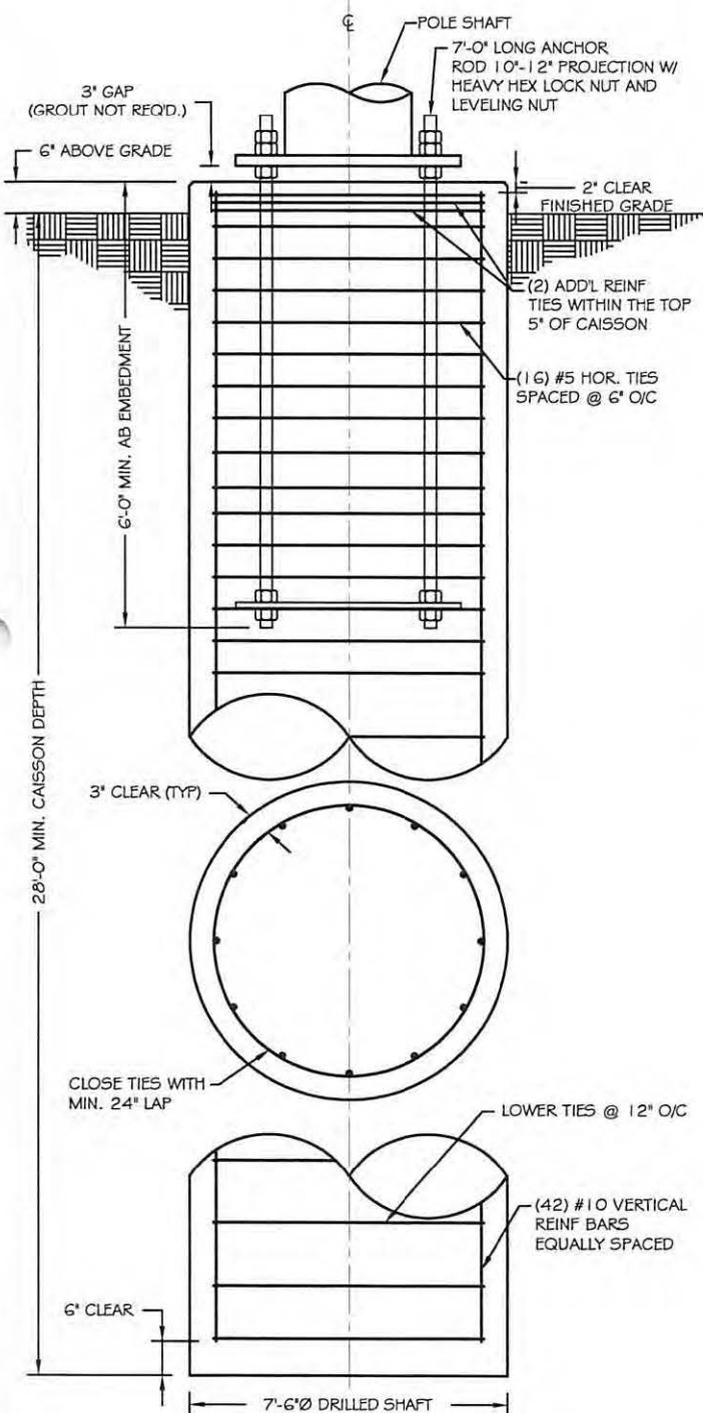
3. CAISSON FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 336, "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DRILLED PIERS", LATEST EDITION.

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

5. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: EAST KENTUCKY ENGINEERING
REPORT NO.: 165-000-0119 (DATED 1/11/21)

6. ESTIMATED CONCRETE VOLUME = 47 CUBIC YARDS.

7. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 7028 FT*KIPS
SHEAR: 53 KIPS
AXIAL: 77 KIPS



CAISSON FOUNDATION

NOT TO SCALE



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

inxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mjpeng.com	Job 180-ft Monopole - MFP #23521-001	Page 1 of 9
	Project Isonville	Date 17:49:01 01/18/21
	Client TP-19560	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:

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	180.00-134.00	46.00	4.25	18	21.0000	31.0223	0.1875	0.7500	A572-65 (65 ksi)
L2	134.00-85.25	53.00	5.75	18	29.7214	41.2689	0.3750	1.5000	A572-65 (65 ksi)
L3	85.25-44.25	46.75	6.75	18	39.2661	49.4518	0.4375	1.7500	A572-65 (65 ksi)
L4	44.25-1.00	50.00		18	47.1061	58.0000	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	21.2950	12.3860	677.8263	7.3884	10.6680	63.5383	1356.5444	6.1942	3.3660	17.952
	31.4720	18.3506	2204.3015	10.9464	15.7594	139.8726	4411.5035	9.1770	5.1299	27.36
L2	31.0623	34.9295	3800.4827	10.4180	15.0985	251.7133	7605.9662	17.4681	4.5710	12.189
	41.8476	48.6739	10283.7095	14.5173	20.9646	490.5278	20580.9505	24.3416	6.6033	17.609
L3	41.0764	53.9183	10270.1389	13.7841	19.9472	514.8673	20553.7915	26.9643	6.1408	14.036
	50.1472	68.0625	20658.1425	17.4001	25.1215	822.3284	41343.4675	34.0377	7.9335	18.134
L4	49.2491	73.9640	20297.5642	16.5452	23.9299	848.2086	40621.8364	36.9890	7.4107	14.821
	58.8176	91.2525	38116.9297	20.4125	29.4640	1293.6780	76284.0146	45.6349	9.3280	18.656

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	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 180.00-134.00				1	1	1			

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mpeng.com	Job 180-ft Monopole - MFP #23521-001	Page 2 of 9
	Project Isonville	Date 17:49:01 01/18/21
	Client TP-19560	Designed by JC

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
L2 134.00-85.25				1	1	1			
L3 85.25-44.25				1	1	1			
L4 44.25-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_{AA}	Weight
							ft ² /ft	plf
1 5/8"	C	No	Yes	Inside Pole	175.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	165.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	155.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	145.00 - 1.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	135.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	125.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00
1 5/8"	C	No	Yes	Inside Pole	105.00 - 1.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	180.00-134.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.05
L2	134.00-85.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2.89
L3	85.25-44.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2.78
L4	44.25-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	2.93

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mpeng.com	Job 180-ft Monopole - MFP #23521-001	Page 3 of 9
	Project Isonville	Date 17:49:01 01/18/21
	Client TP-19560	Designed by JC

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	180.00-134.00	A	1.752	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.05
L2	134.00-85.25	A	1.690	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.89
L3	85.25-44.25	A	1.604	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.78
L4	44.25-1.00	A	1.446	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	2.93

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Hor: Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	175.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	175.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	175.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	175.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	175.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	175.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None		0.0000	175.00	No Ice	30.00	30.00	1.80
						1/2" Ice	35.00	35.00	2.60
						1" Ice	40.00	40.00	3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	165.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	165.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	165.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	165.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08

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Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A		Weight
			Hor-	Lateral	Vert			Front	Side	
			ft	ft	ft	°	ft	ft ²	ft ²	K
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	165.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	165.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None	0.0000	165.00	No Ice	30.00	30.00	1.80		
						1/2" Ice	35.00	35.00	2.60	
						1" Ice	40.00	40.00	3.40	
**										
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	155.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	155.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	155.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	155.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	155.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	155.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None	0.0000	155.00	No Ice	30.00	30.00	1.80		
						1/2" Ice	35.00	35.00	2.60	
						1" Ice	40.00	40.00	3.40	
**										
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	135.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	135.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	135.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	135.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	135.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	135.00	No Ice	1.86	0.87	0.05	
			0.00				1/2" Ice	2.03	1.00	0.06
			0.00				1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None	0.0000	135.00	No Ice	30.00	30.00	1.80		
						1/2" Ice	35.00	35.00	2.60	
						1" Ice	40.00	40.00	3.40	
**										
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	125.00	No Ice	12.41	5.04	0.08	
			0.00				1/2" Ice	12.89	5.71	0.17
			0.00				1" Ice	13.38	6.37	0.26

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Hor- Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	125.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	125.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	125.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	125.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	125.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None		0.0000	125.00	No Ice	30.00	30.00	1.80
						1/2" Ice	35.00	35.00	2.60
						1" Ice	40.00	40.00	3.40
**									
(4) Andrew NN-65A-M w/ mount pipe	A	From Face	3.00	0.0000	105.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	B	From Face	3.00	0.0000	105.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Andrew NN-65A-M w/ mount pipe	C	From Face	3.00	0.0000	105.00	No Ice	12.41	5.04	0.08
			0.00			1/2" Ice	12.89	5.71	0.17
			0.00			1" Ice	13.38	6.37	0.26
(4) Ericsson 2212 B13	A	From Face	2.00	0.0000	105.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	B	From Face	2.00	0.0000	105.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
(4) Ericsson 2212 B13	C	From Face	2.00	0.0000	105.00	No Ice	1.86	0.87	0.05
			0.00			1/2" Ice	2.03	1.00	0.06
			0.00			1" Ice	2.20	1.14	0.08
12' Platform w/ Handrail	C	None		0.0000	105.00	No Ice	30.00	30.00	1.80
						1/2" Ice	35.00	35.00	2.60
						1" Ice	40.00	40.00	3.40
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Hor- Lateral	Vert						
			ft	ft	°	°	ft	ft	ft ²	K	
HP-4	A	Paraboloid w/Shroud (HP)	From Face	1.00	0.0000	145.00	4.00	No Ice	12.57	0.17	
				0.00					1/2" Ice	13.10	0.28
				0.00					1" Ice	13.62	0.39
HP-4	B	Paraboloid w/Shroud (HP)	From Face	1.00	0.0000	145.00	4.00	No Ice	12.57	0.17	
				0.00					1/2" Ice	13.10	0.28
				0.00					1" Ice	13.62	0.39

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Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 134	Pole	Max Tension	5	0.00	0.00	-0.00
			Max. Compression	8	-42.13	0.00	1.29
			Max. Mx	4	-12.81	-618.39	0.04
			Max. My	2	-12.89	0.00	616.03
			Max. Vy	4	24.72	-618.39	0.04
			Max. Vx	6	24.41	0.00	-615.64
			Max. Torque	4			0.59
L2	134 - 85.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-91.50	0.00	1.29
			Max. Mx	4	-35.47	-2468.49	-2.21
			Max. My	6	-35.53	0.00	-2450.76
			Max. Vy	4	47.58	-2468.49	-2.21
			Max. Vx	6	47.26	0.00	-2450.76
			Max. Torque	4			0.59
L3	85.25 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-109.76	0.00	1.29
			Max. Mx	4	-51.50	-4434.34	-4.13
			Max. My	6	-51.53	0.00	-4403.86
			Max. Vy	4	50.50	-4434.34	-4.13
			Max. Vx	6	50.19	0.00	-4403.86
			Max. Torque	4			0.59
L4	44.25 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-138.05	0.00	1.29
			Max. Mx	4	-76.58	-7028.39	-6.47
			Max. My	6	-76.58	0.00	-6982.49
			Max. Vy	4	52.81	-7028.39	-6.47
			Max. Vx	6	52.51	0.00	-6982.49
			Max. Torque	4			0.58

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Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	48.701	13	2.4188	0.0000
L2	138.25 - 85.25	28.582	13	2.0136	0.0000
L3	91 - 44.25	11.884	13	1.2893	0.0000
L4	51 - 1	3.570	13	0.6588	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	(4) Andrew NN-65A-M w/ mount pipe	13	46.172	2.3770	0.0008	28804
165.00	(4) Andrew NN-65A-M w/ mount pipe	13	41.155	2.2909	0.0008	9601
155.00	(4) Andrew NN-65A-M w/ mount pipe	13	36.264	2.1979	0.0007	5759
145.00	HP-4	13	31.582	2.0932	0.0007	4113
135.00	(4) Andrew NN-65A-M w/ mount pipe	13	27.192	1.9723	0.0006	3471
125.00	(4) Andrew NN-65A-M w/ mount pipe	13	23.144	1.8338	0.0005	3534
105.00	(4) Andrew NN-65A-M w/ mount pipe	13	16.061	1.5210	0.0003	3674

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 134	197.047	4	9.8103	0.0000
L2	138.25 - 85.25	115.782	4	8.1695	0.0000
L3	91 - 44.25	48.187	4	5.2322	0.0000
L4	51 - 1	14.476	4	2.6728	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	(4) Andrew NN-65A-M w/ mount pipe	4	186.835	9.6409	0.0030	7482
165.00	(4) Andrew NN-65A-M w/ mount pipe	4	166.579	9.2927	0.0029	2490
155.00	(4) Andrew NN-65A-M w/ mount pipe	4	146.826	8.9160	0.0028	1490
145.00	HP-4	4	127.909	8.4920	0.0026	1060
135.00	(4) Andrew NN-65A-M w/ mount pipe	4	110.162	8.0020	0.0024	891
125.00	(4) Andrew NN-65A-M w/ mount pipe	4	93.787	7.4407	0.0021	901

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
105.00	(4) Andrew NN-65A-M w/ mount pipe	4	65.111	6.1721	0.0014	926

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio P _u / φP _n
	ft		ft	ft		in ²	K	K	
L1	180 - 134 (1)	TP31.0223x21x0.1875	46.00	0.00	0.0	17.7995	-12.81	1125.27	0.011
L2	134 - 85.25 (2)	TP41.2689x29.7214x0.375	53.00	0.00	0.0	47.1828	-35.47	3455.80	0.010
L3	85.25 - 44.25 (3)	TP49.4518x39.2661x0.4375	46.75	0.00	0.0	66.0203	-51.50	4799.09	0.011
L4	44.25 - 1 (4)	TP58x47.1061x0.5	50.00	0.00	0.0	91.2525	-76.58	6525.65	0.012

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{ux}	Ratio M _{ux} / φM _{ux}	M _{uy}	φM _{uy}	Ratio M _{uy} / φM _{uy}
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	180 - 134 (1)	TP31.0223x21x0.1875	618.39	693.16	0.892	0.00	693.16	0.000
L2	134 - 85.25 (2)	TP41.2689x29.7214x0.375	2468.49	2812.53	0.878	0.00	2812.53	0.000
L3	85.25 - 44.25 (3)	TP49.4518x39.2661x0.4375	4434.35	4685.60	0.946	0.00	4685.60	0.000
L4	44.25 - 1 (4)	TP58x47.1061x0.5	7028.40	7709.46	0.912	0.00	7709.46	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	φV _n	Ratio V _u / φV _n	Actual T _u	φT _n	Ratio T _u / φT _n
	ft		K	K		kip-ft	kip-ft	
L1	180 - 134 (1)	TP31.0223x21x0.1875	24.72	562.63	0.044	0.59	1389.33	0.000
L2	134 - 85.25 (2)	TP41.2689x29.7214x0.375	47.58	1727.90	0.028	0.59	5639.97	0.000
L3	85.25 - 44.25 (3)	TP49.4518x39.2661x0.4375	50.50	2399.54	0.021	0.58	9395.67	0.000
L4	44.25 - 1 (4)	TP58x47.1061x0.5	52.81	3262.83	0.016	0.58	15458.00	0.000

Pole Interaction Design Data

Section No.	Elevation	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
	ft								
L1	180 - 134 (1)	0.011	0.892	0.000	0.044	0.000	0.905	1.000	4.8.2 ✓
L2	134 - 85.25 (2)	0.010	0.878	0.000	0.028	0.000	0.889	1.000	4.8.2 ✓
L3	85.25 - 44.25 (3)	0.011	0.946	0.000	0.021	0.000	0.958	1.000	4.8.2 ✓

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Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	44.25 - 1 (4)	0.012	0.912	0.000	0.016	0.000	0.924 ✓	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	180 - 134	Pole	TP31.0223x21x0.1875	1	-12.81	1125.27	90.5	Pass	
L2	134 - 85.25	Pole	TP41.2689x29.7214x0.375	2	-35.47	3455.80	88.9	Pass	
L3	85.25 - 44.25	Pole	TP49.4518x39.2661x0.4375	3	-51.50	4799.09	95.8	Pass	
L4	44.25 - 1	Pole	TP58x47.1061x0.5	4	-76.58	6525.65	92.4	Pass	
							Summary		
							Pole (L3)	95.8	Pass
							RATING =	95.8	Pass

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Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G

<i>Factored Base Reactions:</i>	<i>Pole Shape:</i>	<i>Anchor Rods:</i>	<i>Base Plate:</i>
Moment: 7028 ft-kips	18-Sided	(22) 2.25 in. A615 GR. 75	2.5 in. x 71.5 in. Round
Shear: 53 kips	<i>Pole Dia. (D_f):</i>	Anchor Rods Evenly Spaced	fy = 50 ksi
Axial: 77 kips	58.00 in	On a 65.5 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
 $I_{bolts} = 11798.19 \text{ in}^2$ Momet of Inertia
 $P_u = 238 \text{ kips}$ Compr Force
 $V_u = 2.4 \text{ kips}$ Shear Force
 $R_{nt} = 325.00 \text{ kips}$ Nominal Tensile Strength
 $n = 0.50$ for detail type (d)
Stress Rating = 93.2% Satisfies TIA-G 4.9.9

Base Plate Calculation According to TIA-222-G

$\phi = 0.90$ TIA 4.7
 $M_{PL} = 543.4 \text{ in-kip}$ Plate Moment
 $L = 8.3 \text{ in}$ Section Length
 $Z = 12.9$ Plastic Section Modulus
 $M_p = 647.1 \text{ in-kip}$ Plastic Moment
 $\phi M_n = 582.4 \text{ in-kip}$ Factored Resistance

Calculated Moment vs Factored Resistance

$543.37 \text{ in-kip} \leq 582 \text{ in-kip}$

Stress Rating = 93.3%

Anchor Rods Are Adequate	93.2% <input checked="" type="checkbox"/>
Base Plate is Adequate	93.3% <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	180-ft monopole - MFP #23521-001	Page	FND
	Project	Isonville	Date	1/18/2021
	Client	TAPP TP-19560	Designed by	Mike

Caisson Calculation

According to ANSI/TIA-222-G

1. Foundation overturning resistance calculated with PLS Caisson, for Brom's method for rigid piles. Soil layers modeled after recommendations from the geotechnical report.
2. Cohesion strength for the upper 22.5 ft has been reduced by 50%
3. In lieu of a soil resistance factor $f_s = 0.75$ (TIA-9.4.1) an additional safety factor against soil failure of 1.33 has been applied.
4. Foundation has been designed with factored loads per TIA-222-G.
5. No groundwater within the depth of the foundation.

*** PIER PROPERTIES	CONCRETE STRENGTH (ksi) = 4.50	STEEL STRENGTH (ksi) = 60.00						
	DIAMETER (ft) = 7.500	DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50						
*** SOIL PROPERTIES								
	LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (pcf)	KP	PHI (degrees)
	1	S	15.00	0.00	100.0		1.000	-0.00
	2	S	16.20	15.00	165.0		3.690	35.00
	3	S	0.40	31.20	150.0		2.663	27.00
	4	S	4.90	31.60	165.0		3.255	32.00
	5	S	2.00	36.50	150.0		2.663	27.00
*** DESIGN (FACTORED) LOADS AT TOP OF PIER	MOMENT (ft-k) = 7028.0	VERTICAL (k) = 77.0	SHEAR (k) = 53.0					
	ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.33							
*** CALCULATED PIER LENGTH (ft) = 28.500								
*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER								
	TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (pcf)	KP	FORCE (k)	ARM (ft)
	S	0.50	15.00	100.0		1.000	253.13	10.50
	S	15.50	7.40	165.0		3.690	1297.33	19.56
	S	22.90	5.60	165.0		3.690	-1479.23	25.84
*** SHEAR AND MOMENTS ALONG PIER								
				WITH THE ADDITIONAL SAFETY FACTOR			WITHOUT ADDITIONAL SAFETY FACTOR	
	DISTANCE BELOW TOP OF PIER (ft)	SHEAR (k)	MOMENT (ft-k)		SHEAR (k)	MOMENT (ft-k)		
	0.00	71.2	10186.9		53.4	7640.4		
	2.85	65.0	10385.0		48.8	7789.0		
	5.70	40.8	10540.2		30.6	7905.3		
	8.55	-1.7	10600.3		-1.3	7950.4		
	11.40	-62.4	10513.3		-46.8	7885.1		
	14.25	-141.5	10227.0		-106.1	7670.5		
	17.10	-398.7	9565.5		-299.0	7174.3		
	19.95	-871.7	7781.6		-653.8	5836.3		
	22.80	-1456.0	4490.9		-1092.1	3368.3		
	25.65	-806.8	1176.2		-605.2	882.2		
	28.50	0.0	-0.0		0.0	-0.0		
*** TOTAL REINFORCEMENT PCT = 0.78	REINFORCEMENT AREA (in ²) = 49.62							
*** USABLE AXIAL CAP. (k) = 77.0	USABLE MOMENT CAP. (ft-k) = 8090.3							

For Design:

7.5-ft Diameter caisson x 28.5-ft long (28-ft Embedded with 0.5-ft above grade)
 Concrete strength = 4500 PSI @ 28 days. Estimated Concrete Volume = 47 CY3.
 (42) #10 Vertical Rebar. Steel Cross-Section = 53.34 in²

EXHIBIT 6



KENTUCKY TRANSPORTATION CABINET
KENTUCKY AIRPORT ZONING COMMISSION

TC 55-2
Rev. 05/2017
Page 2 of 2

APPLICATION FOR PERMIT TO CONSTRUCT OR ALTER A STRUCTURE

APPLICANT (name) East Kentucky Network, LLC		PHONE 606-339-1006	FAX 606-339-1363	KY AERONAUTICAL STUDY #	
ADDRESS (street) 101 Technology Trail		CITY Ivel		STATE KY	ZIP 41642
APPLICANT'S REPRESENTATIVE (name) Cindy McCarty		PHONE 606-339-1006	FAX 606-339-1363		
ADDRESS (street) 101 Technology Trail		CITY Ivel		STATE KY	ZIP 41642
APPLICATION FOR <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> Alteration <input type="checkbox"/> Existing				WORK SCHEDULE	
DURATION <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary (months days)				Start 3/1/2021 End 3/31/2021	
TYPE <input type="checkbox"/> Crane <input type="checkbox"/> Building		MARKING/PAINTING/LIGHTING PREFERRED			
<input checked="" type="checkbox"/> Antenna Tower		<input type="checkbox"/> Red Lights & Paint <input type="checkbox"/> White- medium intensity <input type="checkbox"/> White- high intensity			
<input type="checkbox"/> Power Line <input type="checkbox"/> Water Tank		<input type="checkbox"/> Dual- red & medium intensity white <input type="checkbox"/> Dual- red & high intensity white			
<input type="checkbox"/> Landfill <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Other None			
LATITUDE 38°04'10.44."		LONGITUDE 83°04'35.70"		DATUM <input checked="" type="checkbox"/> NAD83 <input type="checkbox"/> NAD27	
<input type="checkbox"/> Other					
NEAREST KENTUCKY City Isonville County Elliot		NEAREST KENTUCKY PUBLIC USE OR MILITARY AIRPORT West Liberty Airport			
SITE ELEVATION (AMSL, feet) 1172		TOTAL STRUCTURE HEIGHT (AGL, feet) 190		CURRENT (FAA aeronautical study #) 2021-ASO-1276-OE	
OVERALL HEIGHT (site elevation plus total structure height, feet) 1362				PREVIOUS (FAA aeronautical study #)	
DISTANCE (from nearest Kentucky public use or Military airport to structure) 12.5 nm				PREVIOUS (KY aeronautical study #)	
DIRECTION (from nearest Kentucky public use or Military airport to structure) NE					
DESCRIPTION OF LOCATION (Attach USGS 7.5 minute quadrangle map or an airport layout drawing with the precise site marked and any certified survey.) Located north of highway 32 near Isonville (Eliott County), KY					
DESCRIPTION OF PROPOSAL New 180' tower with top-mounted antennas (overall height of 190' AGL)					
FAA Form 7460-1 (Has the "Notice of Construction or Alteration" been filed with the Federal Aviation Administration?) <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes, when? 1-15-2021					
CERTIFICATION (I hereby certify that all the above entries, made by me, are true, complete, and correct to the best of my knowledge and belief.)					
PENALTIES (Persons failing to comply with KRS 183.861 to 183.990 and 602 KAR 050 are liable for fines and/or imprisonment as set forth in KRS 183.990(3). Noncompliance with FAA regulations may result in further penalties.)					
NAME Cindy McCarty	TITLE In-House Counsel	SIGNATURE /s/ Cindy McCarty		DATE 1-15-2021	
COMMISSION ACTION		<input type="checkbox"/> Chairperson, KAZC			
		<input type="checkbox"/> Administrator, KAZC			
<input type="checkbox"/> Approved	SIGNATURE		DATE		
<input type="checkbox"/> Disapproved					



Notice of Proposed Construction or Alteration - Off Airport

Add a New Case (Off Airport) - Desk Reference Guide V_2018.2.1

Add a New Case (Off Airport) for Wind Turbines - Met Towers (with WT Farm) - WT-Barge Crane - Desk Reference Guide V_2018.2.1

Project Name: EAST -000611599-21 **Sponsor:** East Kentucky Network, LLC

Details for Case : Isonville

[Show Project Summary](#)

Case Status		Date Accepted: 01/15/2021	
ASN:	2021-ASO-1276-OE	Date Determined:	None
Status:	Accepted	Letters:	None
Public Comments: None		Documents:	01/15/2021 2C Map (FAA).pdf
		Project Documents:	None
Construction / Alteration Information		Structure Summary	
Notice Of:	Construction	Structure Type:	Monopole
Duration:	Permanent	Structure Name:	Isonville
<i>if Temporary :</i> Months: Days:		FDC NOTAM:	
Work Schedule - Start:	03/01/2021	NOTAM Number:	
Work Schedule - End:	03/31/2021	FCC Number:	
*For temporary cranes-Does the permanent structure require separate notice to the FAA? To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed. If it is not filed, please state the reason in the Description of Proposal.		Prior ASN:	
State Filing:		Proposed Frequency Bands	
Structure Details		Select any combination of the applicable frequencies/powers identified in the Colo Void Clause Coalition, Antenna System Co-Location, Voluntary Best Practices, effective 21 Nov 2007, to be evaluated by the FAA with your filing. If not within one of the frequency bands listed below, manually input your proposed frequency(ies) and power using the Add Specific Frequency link.	
Latitude:	38° 4' 10.44" N	Add Specific Frequency	
Longitude:	83° 4' 35.70" W	Low Freq	High Freq
Horizontal Datum:	NAD83		
Site Elevation (SE):	1172 (nearest foot) PASSED		
Structure Height (AGL):	190 (nearest foot)		
Current Height (AGL):	(nearest foot)		
* For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal			
Minimum Operating Height (AGL):	(nearest foot)		
* For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.			
Requested Marking/Lighting:	None		
Other :			
Recommended Marking/Lighting:			
Current Marking/Lighting:	N/A Proposed Structure		
Other :			
Nearest City:	Isonville		
Nearest State:	Kentucky		
Description of Location:	North of Highway 32 near Isonville (Elliot County), Kentucky.		
Description of Proposal:			
A new 180' structure with top mounted antennas or other appurtenances (overall height of 190' AGL).			

Previous [Back to Search Result](#) Next

[Close](#) [Print](#)



EXHIBIT 7

Driving Directions for Isonville Site

1. Beginning at 113 Main Street, Sandy Hook, Kentucky pointing northeast driving approximately .1 miles to the intersection of Main Street and Route 7 and Route 31.
2. Turn right onto Route 32 and drive 3.8 miles.
3. Turn left at the gravel road (signs posted).
4. Drive .3 miles and your destination will be on your right (signs posted).

Prepared by:
Daryl Bartley
CELL SITE COMPLIANCE AGENT
East Kentucky Network, LLC
D/b/a Appalachian Wireless
(606) 791-0310 (cell)
dbartley@ekn.com

Isonville Replacement

Location:

810 Sandy Hook Tower Road
Sandy Hook, Kentucky 41171

Coordinates:

38° 04' 10.44" N
83° 04' 35.70" W

Legend

 1/2 Mile Search Area

Proposed Isonville Tower  **Existing Tower**

Rice Hollow Rd

1621
32

Brier Fork Rd

Google Earth

© 2021 Google



2000 ft

EXHIBIT 8

Deed Book 85
Page 120

DEED OF CONVEYANCE

THIS DEED OF CONVEYANCE, made and entered into this 15th day of MAY, 1995, by and between MARY LOU WAGGONER AND VERNON WAGGONER, HER HUSBAND, ISONVILLE, KY 41149, PARTIES OF THE FIRST PART, AND FOOTHILLS RURAL TELEPHONE COOPERATIVE CORPORATION, INC., MOUNTAIN RURAL TELEPHONE COOPERATIVE CORPORATION, INC., THACKER-GRIGSBY TELEPHONE CO., INC. AND HAROLD TELEPHONE COMPANY, INC., CORPORATE PARTNERS d/b/a APPALACHIAN CELLULAR GENERAL PARTNERSHIP, ACTING BY AND THROUGH HAROLD TELEPHONE COMPANY, INC., P. O. BOX 160, HAROLD, KENTUCKY, THE MANAGING GENERAL PARTNER, COLLECTIVELY, PARTY OF THE SECOND PART,

WITNESSETH:

That for and in consideration of the sum of \$12,000.00, cash in hand paid, the receipt of which is hereby acknowledged, said Parties of the First Part do hereby sell, assign, transfer and convey unto the Party of the Second Part, its successors and assigns, their entire interest in that certain tract or parcel of land located in Elliott County, Kentucky, (Newcombe Mountain) and being part of Tract No. 1 the same land acquired by Deed of Conveyance from Patricia Addington, et al., dated January 11, 1993, and recorded in Deed Book 82, at page 80, Elliott County Court Clerk's Office, and more particularly described as follows:

as
2/12/95
PA

BEGINNING AT AN IRON PIN SET THIS SURVEY. SAID IRON PIN BEING S 57 DEGREES 27' 39" e 48.03 FEET FROM A POWER POLE AND 3.70' FEET FROM A 12 INCH OAK.

THENCE, N 69 DEGREES 00' 00" E 105.47' FEET TO AN IRON PIN SET THIS SURVEY, SAID POINT BEING 0.90' FEET FROM A 22 INCH OAK STUMP;

THENCE, S 25 DEGREES 33' 23" E 91.27 FEET TO AN IRON PIN SET THIS SURVEY;

THENCE, S 24 DEGREES 19' 22" W 42.94' FEET TO AN IRON PIN SET THIS SURVEY;

THENCE, S 24 DEGREES 19' 22" W 8.13' FEET TO A POINT AT THE EDGE OF GRAVEL ROAD;

THENCE, RUNNING WITH EDGE OF GRAVEL ROAD WITH THE FOLLOWING CALLS, N 52 DEGREES 22' 31" 2 42.84' FEET TO A POINT;

THENCE, N 54 DEGREES 21' 52" W 64.47 FEET TO A POINT;

THENCE, N 60 DEGREES 42' 21" W 47.41' FEET TO A POINT;

THENCE, LEAVING EDGE OF ROAD AND RUNNING N 69.00 DEGREES 00' 00" E 11.65' FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL OF PROPERTY CONTAINS 0.20 ACRES MORE OR LESS.

The Parties of the First Part further give, grant and convey unto the Party of the Second Part, the unrestricted right to use the road adjacent to the property for ingress and egress for the purpose of constructing, maintaining and operating the tower and appurtenant facilities relating to the operation of a cellular radio telephone service. In using said roadway, the Party of the Second Part covenants that it will maintain said roadway and will not at any time block the use of same by the Parties of First Part or any of their related interest. The Parties of the First Part further grant unto the Party of the Second Part the

right to construct, maintain and operate telephone and power transmission lines over and adjacent to their remaining property for the purpose of providing service to the tower site.

It is understood and agreed by and between the parties hereto that all mineral and mineral substances, and the right to mine and remove the same, are hereby excepted and reserved to the Parties of the First Part in accordance with their interest.

TO HAVE AND TO HOLD, the same together with all appurtenances thereunto belonging unto the Party of the Second Part, its successors and assigns under covenant of general warranty.

IN WITNESS WHEREOF, the Parties of the First Part have hereunto set their hand as of the day and year first above written.

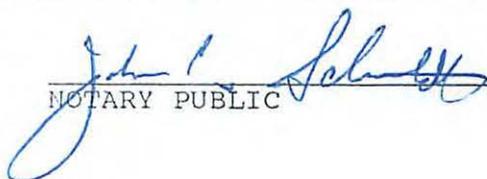
PARTIES OF THE FIRST PART

Mary Lou Waggoner
MARY LOU WAGGONER
Vernon Waggoner
VERNON WAGGONER, HER
HUSBAND

STATE OF KENTUCKY
COUNTY OF ELLIOTT

I, JOHN C. SCHMOLDT, a Notary Public for the county and state aforesaid, hereby certify that the foregoing Deed was produced before me and acknowledged in my presence by Mary Lou Waggoner and Vernon Waggoner, her husband, this the 15TH day of MAY, 1995.

My commission expires: 7-9-98

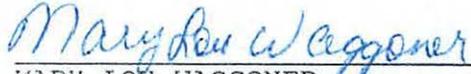

NOTARY PUBLIC

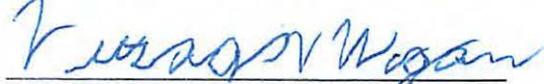
SEAL:

CERTIFICATE:

We, Mary Lou Waggoner and Vernon Waggoner, her husband, Grantors, and Paul R. Gearheart, President of Harold Telephone Company, Inc., the acting General Partner of the Appalachian Cellular General Partnership, Grantee, and Mary Lou Waggoner and Vernon Waggoner, her husband, do hereby certify pursuant to KRS 382, the above stated consideration in the amount of \$12,000.00 is the true, correct and full consideration paid for the property herein conveyed. We further certify our understanding that the falsification of the stated consideration or sale price of the property is a Class D Felony subject to one to five years imprisonment and fines up to \$10,000.00.

GRANTORS:


MARY LOU WAGGONER


VERNON WAGGONER, HER HUSBAND

STATE OF KENTUCKY
COUNTY OF ELLIOTT

SUBSCRIBED AND SWORN to before me by Mary Lou Waggoner and
Vernon Waggoner, her husband, this the 15th day of MAY,
1995.

My commission expires: 7-9-98

John C. Schultz
NOTARY PUBLIC

SEAL:

GRANTEE:

APPALACHIAN CELLULAR GENERAL
PARTNERSHIP

BY: Paul R. Gearheart
PAUL R. GEARHEART,
PRESIDENT
HAROLD TELEPHONE COMPANY,
INC.
MANAGING GENERAL PARTNER

STATE OF KENTUCKY
COUNTY OF FLOYD

SUBSCRIBED AND SWORN to before me by Paul R. Gearheart,
President of Harold Telephone Company, and Managing Partner for
Appalachian Cellular General Partnership, this the 15th day of
MAY, 1995.

My commission expires: Oct 19, 1995

Mary L. Bush
NOTARY PUBLIC State at Eye

The foregoing instrument
was prepared by:

Clifford B. Latta

CLIFFORD B. LATTA
LATTA & BROWN LAW OFFICE
P. O. BOX 550
PRESTONSBURG, KY 41653

STATE OF KENTUCKY
COUNTY OF ELLIOTT

} SCT.

I, Judie Holbrook, Clerk of the County Court for the County and State aforesaid, certify that
the foregoing Deed was on the 17 day of May,
1995, lodged in my office for record, whereupon the same with the foregoing and this
certificate have been duly recorded in my office in Deed Book 85 Page 20.

Given under my hand, this 17 day of May, 1995.

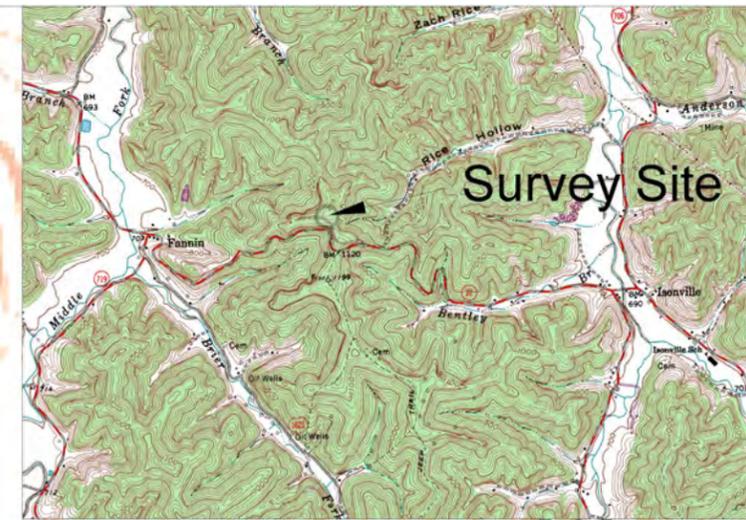
Judie Holbrook Clerk
By Reeda A. Mason D.C.

Book No. 85 Page No. 120
10:15 AM
MAY 17 1995
ELLIOTT COUNTY CLERK
JUDIE HOLBROOK

EXHIBIT 9

EXHIBIT 10

APPALACHIAN WIRELESS
 101 TECHNOLOGY TRAIL
 IVEL, KY. 41642
 PROPOSED TOWER REPLACEMENT
 OFF HWY 32 NEAR ISONVILLE
 IN ELLIOT COUNTY, KY.



039-00-00-013.00
 TRACY & SANDRA KITCHEN
 2801 S KY 32
 SANDY HOOK, KY 41171
 DB 97 PG 711

039-00-00-013.06
 DANIEL & CORY NUETZMANN
 4608 S 600 WEST
 TRAFALGAR, IN 46181
 DB 120 PG 533

039-00-00-013.00
 TRACY & SANDRA KITCHEN
 2801 S KY 32
 SANDY HOOK, KY 41171
 DB 97 PG 711

Affected Area

039-00-00-013.06
 DANIEL & CORY NUETZMANN
 4608 S 600 WEST
 TRAFALGAR, IN 46181
 DB 120 PG 533

Proposed Monopole
 LAT: 38°04'10.44057"
 LON: 83°04'35.70057"

039-00-00-014.06
 Harold Telephone Co Tr.
 East Ky Network, LLC
 101 Technology Trail
 Ivel, KY 41642

039-00-00-014.05
 MARY KELLY BARNETT WAGONER
 145 WHITE OAK
 SANDY HOOK, KY 41171
 DB 121 PG 727

039-00-00-013.06
 DANIEL & CORY NUETZMANN
 4608 S 600 WEST
 TRAFALGAR, IN 46181
 DB 120 PG 533

039-00-00-014.05
 MARY KELLY BARNETT WAGONER
 145 WHITE OAK
 SANDY HOOK, KY 41171
 DB 121 PG 727

039-00-00-019.00
 ROGER & ITHEL
 4806 SHAKER RD
 FRANKLIN, OH 45005
 DB 91 PG 529

039-00-00-019.00
 ROGER & ITHEL
 4806 SHAKER RD
 FRANKLIN, OH 45005
 DB 91 PG 529

Residence

Access Road

500'

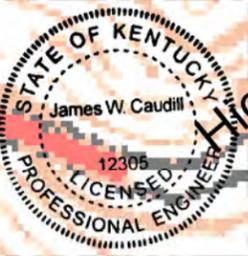
Cem

Access Road

Highway 32

Residence

BM 120



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 ELLIOT COUNTY PROPERTY
 VALUATION ADMINISTRATION OFFICE IN SANDYHOOK, KY.

James W. Caudill
 JAMES W. CAUDILL

12305 01/12/21
 P.E.# DATE

LEGEND

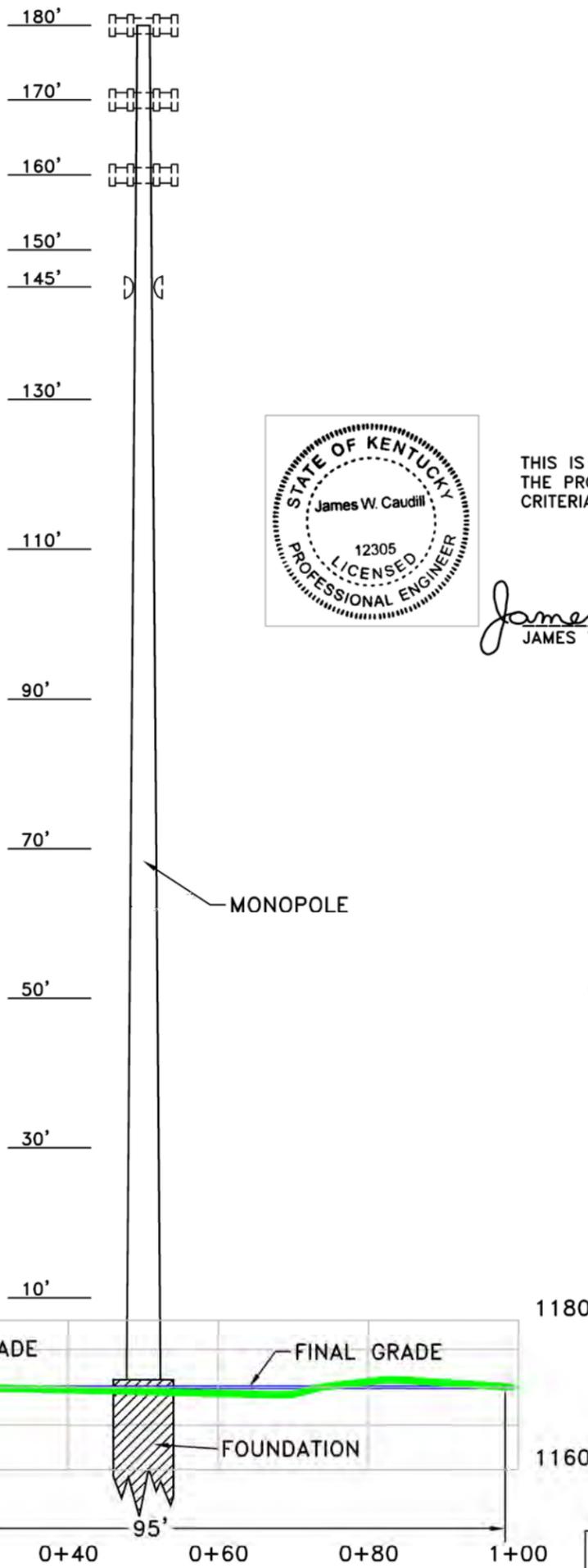
- PVA LINE ————
- DEED LINE ————
- ROAD ————
- STREAM ————
- FENCE ————
- POWER LINE ————
- GAS LINE ————



East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 01/12/21	Property Owners at Proposed Tower Site Near Isonville - N. of 32 East Ky Network, LLC Elliot County, Kentucky
APPROVED JWC	DATE 01/12/21	
SCALE 1" = 200'	SHEET 1 of 3	PROJECT NO. Isonville/ivpva_200

EXHIBIT 11

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 01/12/21
 JAMES W. CAUDILL PE #. DATE

NOTE: SEE FOUNDATION DRAWINGS FOR DETAILS

01/12/21
 SCALE 1" = 20'



East Kentucky Network d/b/a Appalachian Wireless 101 Technology Trail, Ivel, KY 41642		
DRAWN JWC	DATE 01/12/21	Isonville Tower Site Tower Replacement Proposed Layout Located off of Hwy 32 Elliot County, Kentucky
APPROVED JWC	DATE 01/12/21	
SCALE 1" = 20'	SHEET 3 of 3	PROJECT NO. Isonville/ivpro_20

EXHIBIT 12

Utility ID	Utility Name	Utility Type	Class	City	State
4107900	365 Wireless, LLC	Cellular	D	Atlanta	GA
4109300	Access Point, Inc.	Cellular	D	Cary	NC
4108300	Air Voice Wireless, LLC	Cellular	A	Bloomfield Hill	MI
4110650	Alliant Technologies of KY, L.L.C.	Cellular	C	Morristown	NJ
44451184	Alltel Communications, LLC	Cellular	A	Basking Ridge	NJ
4110850	AltaWorx, LLC	Cellular	C	Fairhope	AL
4107800	American Broadband and Telecommunications Company	Cellular	C	Toledo	OH
4108650	AmeriMex Communications Corp.	Cellular	D	Dunedin	FL
4105100	AmeriVision Communications, Inc. d/b/a Affinity 4	Cellular	D	Virginia Beach	VA
4110700	Andrew David Balholm dba Norcell	Cellular	C	Clayton	WA
4108600	BCN Telecom, Inc.	Cellular	D	Morristown	NJ
4110550	Blue Casa Mobile, LLC	Cellular	D	Santa Barbara	CA
4108750	Blue Jay Wireless, LLC	Cellular	C	Carrollton	TX
4111050	BlueBird Communications, LLC	Cellular	C	New York	NY
4202300	Bluegrass Wireless, LLC	Cellular	A	Elizabethtown	KY
4107600	Boomerang Wireless, LLC	Cellular	B	Hiawatha	IA
4105500	BullsEye Telecom, Inc.	Cellular	D	Southfield	MI
4110050	CampusSims, Inc.	Cellular	D	Boston	MA
4100700	Cellco Partnership dba Verizon Wireless	Cellular	A	Basking Ridge	NJ
4106600	Cintex Wireless, LLC	Cellular	D	Rockville	MD
4111000	ComApp Technologies LLC	Cellular	C	Melrose	MA
4101900	Consumer Cellular, Incorporated	Cellular	A	Portland	OR
4106400	Credo Mobile, Inc.	Cellular	A	San Francisco	CA
4108850	Cricket Wireless, LLC	Cellular	A	San Antonio	TX
4001900	CTC Communications Corp. d/b/a EarthLink Business I	Cellular	D	Grand Rapids	MI
10640	Cumberland Cellular Partnership	Cellular	A	Elizabethtown	KY
4101000	East Kentucky Network, LLC dba Appalachian Wireless	Cellular	A	Ivel	KY
4002300	Easy Telephone Service Company dba Easy Wireless	Cellular	D	Ocala	FL
4109500	Enhanced Communications Group, LLC	Cellular	D	Bartlesville	OK
4110450	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

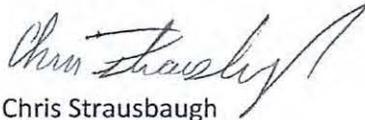
Kentucky Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, KY 40602-0615

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