

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

In the Matter of:

|                                                 |   |                     |
|-------------------------------------------------|---|---------------------|
| The Electronic Application Of Kentucky Power    | ) |                     |
| Company For A Certificate Of Public Convenience | ) |                     |
| And Necessity To Rebuild The Allen Station In   | ) |                     |
| Floyd County, Kentucky ("Allen Station Rebuild  | ) | Case No. 2026-00208 |
| Project")                                       | ) |                     |

**APPLICATION**

Kentucky Power Company ("Kentucky Power" or the "Company") applies to the Public Service Commission of Kentucky ("Commission") pursuant to KRS 278.020(1), 807 KAR 5:001, Section 15, and all other applicable statutes and regulations, for an order granting a certificate of public convenience and necessity ("CPCN") authorizing the Company to expand and upgrade portions of the Allen Station electric transmission grid located in Floyd County, Kentucky (the "Proposed Project"), as described in more detail in this Application.

The Company's compliance with requirements of KRS 278.020, 807 KAR 5:001, Section 14 and 807 KAR 5:001, Section 15 is detailed in **EXHIBIT 1** to the Application.

The Company states the following in support of its Application:

**Applicant**

1.     **Name and Address:**   The Applicant's full name and post office address is: Kentucky Power Company, 1645 Winchester Avenue, Ashland, Kentucky 41101. The Company's electronic mail address is: [Kentucky\\_regulatory\\_services@aep.com](mailto:Kentucky_regulatory_services@aep.com).

2. **Incorporation:** Kentucky Power is a corporation organized on July 21, 1919 under the laws of the Commonwealth of Kentucky. The Company currently is in good standing in Kentucky.<sup>1</sup>

3. **Business:** Kentucky Power is a public utility principally engaged in the provision of electricity to Kentucky consumers. The Company generates and purchases electricity that it distributes and sells at retail to approximately 162,000 customers located in all, or portions of, the Counties of Boyd, Breathitt, Carter, Clay, Elliott, Floyd, Greenup, Johnson, Knott, Lawrence, Leslie, Letcher, Lewis, Magoffin, Martin, Morgan, Owsley, Perry, Pike, and Rowan.

### **Background**

4. The Allen Substation is located in Allen, Kentucky in Floyd County. The existing Substation was originally constructed in the 1930s. Currently, the Allen Substation is a 46kV Substation consisting of four 46kV breakers, a 46kV 17.2 MVAR capacitor bank, two 46kV circuit switchers, a 20 MVA 46/12kV distribution transformer, and three 12kV circuit breakers. The Allen Substation is connected to Stanville, Prestonsburg, and McKinney Substations. Allen Substation serves 739 distribution customers.

### **The Proposed Project**

5. The Proposed Project addresses baseline violations and supplemental needs identified by PJM Interconnection, LLC (“PJM”) and AEP. The Proposed Project will rebuild the Allen Substation at its current location and would be comprised of the following components:

- Rebuilding the Allen Substation as a straight bus station with four 69kV circuit breakers (operating at 46kV) and a 17.2 MVAR capacitor bank;

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<sup>1</sup> A certified copy of the Company’s Articles of Incorporation and all amendments thereto was attached to the Joint Application in *In the Matter Of: The Joint Application Of Kentucky Power Company, American Electric Power Company, Inc. And Central And South West Corporation regarding A Proposed Merger*, P.S.C. Case No. 99-149. The Company’s July 30, 2026 Certificate of Existence is filed as **EXHIBIT 2** to the Application.



- Installing a new 46/12kV 20 MVA distribution bank;
- Replacing limiting equipment for the Stanville-Allen transmission line with higher rated components;
- Reconnecting current transmission lines to the rebuilt Substation;
- Installing and/or placing Substation equipment on raised platforms; and
- Replacing and elevating the control house approximately fifteen feet off of the ground.

6. Additionally, the Allen Substation will be expanded by approximately ten feet along the North-Northwest side of the Substation. This expansion is required to build a drive path in the clear for vehicle navigation. The expansion will be on AEP-owned land and will not require any additional right-of-way (“ROW”).

### **Need For The Project**

7. The Project is necessary to provide adequate, reliable, and safe service to Kentucky Power Customers, and addresses baseline and supplemental violations identified as part of the PJM RTEP process. The PJM Baseline Project Slides are included as **EXHIBIT 10**.

8. Specifically, from a baseline perspective, it was found in the 2026 Winter RTEP case that an N-1-1 outage of 46kV sources from Thelma and Bever Creek would force the power to flow through Stanville-Allen line section causing it to overload. The identified overload is between Allen-Stanville line section. Additionally, the Proposed Project will replace limiting equipment on the Allen-Stanville circuit increasing the rating of the circuit and addressing the identified thermal overload. This will address the thermal violation identified by PJM and AEP.

9. From a supplemental perspective, the Allen Substation currently experiences substantial and recurring flooding due to its location within the floodplain, creating a significant risk to Substation equipment, electrical components, and overall system reliability. Such recurring flooding has led to significant deterioration of the Substation’s foundation and structures. Raising

and rebuilding the Substation will mitigate flood water from reaching station equipment during flooding and torrential weather events. Detailed photos of the torrential events experienced at Allen Substation is provided in **EXHIBIT 14**.

### **PJM Review**

10. The Proposed Project has been through the baseline and supplemental process. The Proposed Project began as a supplemental solution but was converted to a baseline solution in 2021 due to identified violations in the 2026 RTEP-Winter case. The supplemental need for Allen Substation was presented during the July 24, 2019 meeting.

11. After the Proposed Project converted to a baseline project, the first baseline review for the Proposed Project was at the October 15, 2021 RTEP meeting. The Proposed Project was selected on November 19, 2021. Information and documentation regarding the baseline violations and supplemental needs addressed by the Proposed Project is further detailed in the testimony of Company Witness Moore and **EXHIBIT 10**.

### **Estimated Project Cost**

12. The total detailed estimate of the Proposed Project cost is approximately \$49.7 million. As of June 2026, Kentucky Power's assets, net of regulatory assets and deferred charges totaled \$2.2 billion. This cost represents an increase of approximately 2.2%. Thus, the Proposed Project will not materially affect the financial condition of the Company.

13. The Proposed Project will be allocated to the AEP East PJM zone based on a 12 CP allocation. Kentucky Power anticipates funding the cost of the Proposed Project through its operating cash flow and other internally generated funds. The Company does not anticipate issuing new debt for this Proposed Project.

14. Kentucky Power estimates the annual operating cost will be approximately \$20,500 for general maintenance and inspection. The projected additional annual ad valorem taxes resulting from the Proposed Project are expected to total approximately \$953,000.

### **Project Alternatives**

15. During the planning process, the Company developed two holistic electrical alternatives in addition to the Proposed Project. These alternatives are further described in **EXHIBIT 13**.

16. First, the Company considered expanding the Allen Substation to increase its footprint by approximately 2400 square feet (the “Dismissed Alternative”). The Dismissed Alternative would have installed six 69kV circuit breakers to support the four 46kV transmission line exits that currently exists; installed one 46/12kV 20 MVA transformer; installed one 12kV distribution bay with two distribution line exits; removed approximately 0.37 miles of existing transmission line; and constructed approximately 0.33 miles of new transmission line. Additionally, the Dismissed Alternative would have required the Company to raise all major equipment at the Allen Substation by at least eight feet to avoid potential flooding and torrential weather events. The Dismissed Alternative would have also required significant environmental permitting and earthwork, including floodplain permits and qualifying in-county mitigation credits. Because there were not qualifying mitigation credits available for expanding the footprint of the Allen Substation, the Company determined that this alternative was not capable of being constructed and it was dismissed from further consideration.

17. The Company also considered rebuilding the Allen Substation at a new location, which would require new grading and potential wetland mitigation (the “Alternative Solution”). The Alternative Solution would install six 69kV circuit breakers to support the existing four 46kV

transmission line exits that currently exists; install one 46/12kV 20MVA transformer; install one 12kV distribution bay with two distribution line exits; remove 3.34 miles of current transmission line; and constructing 2.61 miles of new transmission line. Under the Alternative Solution, construction activities would likely impact highway US 23 due to installing a new line that would cross over the highway. Additionally, depending on the flood elevation of the alternative site, equipment will potentially need to be raised to avoid damage to substation equipment.

18. The Alternative Solution would cost more than the Proposed Project. In addition to the costs of constructing the Allen Substation, the Company would incur expenses to acquire land rights for a new substation and relocate transmission lines to the new site. These costs include materials, labor, and new rights-of-way (“ROW”), and do not include the additional contingency and risk-related costs associated with the Alternative Solution. The total estimated cost for Alternative Solution is \$49.7 million, which is more expensive than the Proposed Project.

19. The Company rejected the Alternative Solution because it is more costly than the Proposed Project and would require transmission line relocations that present landslide risks, increasing both construction costs and impacting Kentucky Power customers. Accordingly, the Company determined that the Proposed Project is the most cost-effective, reasonable option to address the identified needs.

#### **The Proposed Construction Is Required By The Public Convenience and Necessity**

20. The Proposed Project is required by the public convenience and necessity.

21. The Proposed Project will not produce wasteful duplication as it is the least-cost, most reasonable alternative.

22. The Proposed Project does not duplicate any existing facilities and will not result in an excess of capacity over need. Additionally, the Proposed Project does not represent an excess of investment in relation to the productivity and efficiencies to be gained.

23. The Proposed Project rebuilds the Allen Substation at the same location, elevates substation equipment, replaces limiting equipment on the Allen-Stanville circuit, and increases circuit capacity to resolve identified thermal overloads.

24. By utilizing existing ROW and line routes, the Proposed Project maximizes existing infrastructure, maintains reliable service, and reduces risks to Substation equipment. It also mitigates flooding risks and improves system reliability under N-1-1 conditions.

25. The Proposed Project is located entirely within Kentucky Power's certified territory and will not compete with any public utilities, corporations, or persons.

#### **Real Property And Right-Of-Way**

26. Kentucky Power will not need to acquire new property or additional ROW in connection with the work to be performed to complete the Proposed Project.

27. Upon completion of the Proposed Project, Kentucky Power will file an as-built plan showing the final location and structures of Allen Station with the Commission.

#### **Commencement And Completion Of Work**

28. The Company anticipates beginning construction on the Proposed Project during the second quarter of 2027, depending on the outcome and timing of this proceeding. Work is anticipated to be completed by the fourth quarter of 2028. The planned in-service date sequence is as follows:

- Q1 2027: Anticipated start of construction;
- Q2 2028: Project placed in-service; and
- Q4 2028: Construction complete.

### **Notices**

29. The Proposed Project is limited to rebuilding the Allen Substation on existing Company property at the existing site. As such, there will be no impact to surrounding landowners. The Company did not hold public meetings regarding this Project because the Project will be performed entirely within Company property, does not require any additional land purchase or ROW expansion, and does not affect any outside landowners.

### **Franchises and Permits**

30. Environmental and permitting requirements are expected to be minimal. Kentucky Power anticipates that the Proposed Project will require the Company to obtain coverage under the Kentucky Construct Stormwater General Permit (KYR100000).

31. Kentucky Power does not anticipate that the Proposed Project will affect any federally or state protected species. However, there is some risk of loss to bat habitats. In the event that the Proposed Project results in any critical bat habitat loss, the Company will purchase mitigation credits through the Imperiled Bat Conservation Fund.

### **Exhibits And Testimony**

32. The exhibits and testimony are listed in the Appendix to this Application, and are attached to and made part of this Application.

### **Communications**

33. Kentucky Power respectfully requests that communications in this matter be addressed to the e-mail address identified on Kentucky Power's July 24, 2026 Notice of Election of Use of Electronic Filing Procedures.

### **Request for Deviation**

34. **EXHIBIT 5** is comprised of engineering specification drawings of the major individual components of the Proposed Project. The specifications are demonstrative of the components that make up the general arrangement drawing of the proposed station layout (**EXHIBIT 4**). **EXHIBIT 5** was provided to satisfy the requirements of 807 KAR 5:001, Section 15(2)(d)(2), which requires plans specifications and drawings of the proposed plant, equipment, and facilities. All equipment specified in **EXHIBIT 5** is standard transmission equipment used across the AEP system and is not unique to the Proposed Project.

35. The individual pieces of equipment are designed and engineered by their respective manufacturers and would not be appropriate to be stamped by Kentucky Power or AEP's internal or consultant engineers. KRS 322.340(4), in fact, recognizes that a professional engineer's "seal or stamp and signature shall be used by licensees only if the work being stamped was under the licensee's complete direction and control." Thus, because the specifications for the standard transmission equipment contained in **EXHIBIT 5** were designed by the manufacturer of each piece of equipment, Kentucky Power is unable to provide an **EXHIBIT 5** that is signed or stamped by an engineer registered in Kentucky.

36. To the extent a deviation from this requirement is necessary with respect to **EXHIBIT 5**, Kentucky Power respectfully requests a deviation pursuant to 807 KAR 5:001, Section 22, and requests that the Commission accept **EXHIBIT 5** to satisfy the requirements of 807 KAR 5:001, Section 15(2)(d)(2).

WHEREFORE, Kentucky Power Company respectfully requests the Commission issue an Order:

(1) Granting Kentucky Power a certificate of public convenience and necessity for the Proposed Project authorizing Kentucky Power to:

- (a) Rebuild the Allen Substation at the same location as a straight bus station with four 69kV circuit breakers (operating at 46kV) and a 17.2 MVAR capacitor bank;
- (b) Install a new 46/12kV 20 MVA distribution bank;
- (c) Replace limiting equipment for the Stanville-Allen transmission line with higher rated components;
- (d) Reconnect current transmission lines to the rebuilt Substation;
- (e) Install and/or place Substation equipment on raised platforms;
- (f) Replace and elevate the control house approximately fifteen feet off of the ground; and
- (g) Expand by approximately ten feet along the North-Northwest side of the Substation.

(2) Granting Kentucky Power, to the extent necessary, a deviation pursuant to 807 KAR 5:001, Section 22, as to **EXHIBIT 5** and accepting **EXHIBIT 5** to satisfy the requirements of 807 KAR 5:001, Section 15(2)(d)(2); and



- (3) Granting Kentucky Power such other relief as may be appropriate.

Respectfully submitted,



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COUNSEL FOR KENTUCKY POWER  
COMPANY

## **EXHIBITS**

|                          |                                                                                                                |
|--------------------------|----------------------------------------------------------------------------------------------------------------|
| <b><u>EXHIBIT 1</u></b>  | Filing Requirements Checklist                                                                                  |
| <b><u>EXHIBIT 2</u></b>  | Kentucky Power Company's July 30, 2026<br>Certificate of Existence                                             |
| <b><u>EXHIBIT 3</u></b>  | [Reserved]                                                                                                     |
| <b><u>EXHIBIT 4</u></b>  | Map of Suitable Scale Illustrating the Proposed<br>Project                                                     |
| <b><u>EXHIBIT 5</u></b>  | Plans and Specifications and Drawings of the<br>Proposed Project Signed by an Engineer Licensed<br>in Kentucky |
| <b><u>EXHIBIT 6</u></b>  | List of the major components of the proposed<br>Project and their purpose                                      |
| <b><u>EXHIBIT 7</u></b>  | Siting Study                                                                                                   |
| <b><u>EXHIBIT 8</u></b>  | [Reserved]                                                                                                     |
| <b><u>EXHIBIT 9</u></b>  | [Reserved]                                                                                                     |
| <b><u>EXHIBIT 10</u></b> | Baseline Project PJM Slides                                                                                    |
| <b><u>EXHIBIT 11</u></b> | [Reserved]                                                                                                     |
| <b><u>EXHIBIT 12</u></b> | [Reserved]                                                                                                     |
| <b><u>EXHIBIT 13</u></b> | Comparison of Proposed Project with Alternative                                                                |
| <b><u>EXHIBIT 14</u></b> | Photos of Existing Structures                                                                                  |
| <b><u>EXHIBIT 15</u></b> | [Reserved]                                                                                                     |

## **EXHIBIT 1**

**Allen Station Rebuild Project**

**Application Filing Requirements Checklist**

| <b>Requirement</b>                      | <b>Description of Requirement</b>                                                                                                                                                                                                                                                                                                                                            | <b>Location(s) in Filing</b>   |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <i>General Application Requirements</i> |                                                                                                                                                                                                                                                                                                                                                                              |                                |
| 807 KAR 5:001                           |                                                                                                                                                                                                                                                                                                                                                                              |                                |
| Section 7(1)                            | The application and 10 copies.                                                                                                                                                                                                                                                                                                                                               | Company is e-filing.           |
| Section 4(3)                            | Paper signed by submitting party or attorney.                                                                                                                                                                                                                                                                                                                                | Application at p. 11.          |
| Section 4(3)                            | Name, address, telephone number, fax number, and e-mail address of submitting party or attorney.                                                                                                                                                                                                                                                                             | Application at p. 11.          |
| Section 4(10)                           | Personal information must be redacted.                                                                                                                                                                                                                                                                                                                                       | Complied.                      |
| Section 8(2)(a)                         | At least seven (7) days prior to the submission of its application, an applicant shall file written notice of its election to use electronic filing procedures using the Notice of Election of Use of Electronic Filing Procedures form.                                                                                                                                     | Complied. Filed July 24, 2026. |
| Section 8(4)(b)                         | E-filed documents must be .pdf files that: <ul style="list-style-type: none"><li>• are searchable and optimized for internet viewing;</li><li>• have bookmarks distinguishing sections;</li><li>• if scanned material, be at resolution of 300 DPI</li></ul>                                                                                                                 | Complied.                      |
| Section 8(5)(a)                         | Each electronic submission shall include an introductory file in portable document format that is named “Read1st” and that contains a general description of the filing.                                                                                                                                                                                                     | Complied.                      |
| Section 8(5)(a)                         | Each electronic submission shall include an introductory file in portable document format that is named “Read1st” and that contains a list of all material to be filed in paper or physical medium but not included in the electronic submission, and a statement that the material in the electronic submission are a true representation of the materials in paper medium. | Complied.                      |

|                 |                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 8(5)(b) | The “Read1st” file and any other material that normally contains a signature shall contain a signature in the electronically submitted document.                                                                                                                                                                                                                        | Complied.                                                                                                                                                           |
| Section 14(1)   | Full name, mailing address, and e-mail address of applicant.                                                                                                                                                                                                                                                                                                            | Application at ¶ 1.                                                                                                                                                 |
| Section 14(1)   | Facts on which application is based, with request for the order, authorization, permission, or certificate desired.                                                                                                                                                                                                                                                     | Application, introductory paragraph, <i>passim</i> ; Direct Testimony of Lerah M. Kahn; Direct Testimony of Jasmine L. Moore; Direct Testimony of Tyler M. Benedum. |
| Section 14(1)   | A reference to the particular law requiring Commission approval.                                                                                                                                                                                                                                                                                                        | Application at introductory paragraph.                                                                                                                              |
| Section 14(2)   | If a corporation, the applicant shall identify in the application the state in which it is incorporated and the date of its incorporation, attest that it is currently in good standing in the state in which it is incorporated, and if it is not a Kentucky corporation, state if it is authorized to transact business in Kentucky.                                  | Application at ¶ 2; Application Exhibit 2.                                                                                                                          |
| Section 14(3)   | If a limited liability company, the applicant shall identify in the application the state in which it is organized and the date on which it was organized, attest that it is in good standing in the state in which it is organized, and, if it is not a Kentucky limited liability company, state if it is authorized to transact business in Kentucky.                | N/A                                                                                                                                                                 |
| Section 14(4)   | If the applicant is a limited partnership, a certified copy of its limited partnership agreement and all amendments, if any, shall be annexed to the application, or a written statement attesting that its partnership agreement and all amendments have been filed with the commission in a prior proceeding and referencing the case number of the prior proceeding. | N/A                                                                                                                                                                 |

| <i>Applications for Certificates of Public Necessity</i> |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                         |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 15(2)(a)                                         | The facts relied upon to show that the proposed construction or extension is or will be required by public convenience or necessity.                                                                                                                                                                                                                                                              | Application at introductory paragraph, <i>passim</i> ; Application Exhibits 4-6, 13, 14; Direct Testimony of Lerah M. Kahn; Direct Testimony of Jasmine L. Moore; Direct Testimony of Tyler M. Benedum. |
| Section 15(2)(b)                                         | Copies of franchise or permits, if any, from the proper public authority for the proposed construction or extension, if not previously filed with the Commission.                                                                                                                                                                                                                                 | N/A                                                                                                                                                                                                     |
| Section 15(2)(c)                                         | A full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner of the construction and the names of all public utilities, corporations, or persons with whom the proposed construction or extension is likely to compete.                                                                                         | Application at ¶¶ 5, 6, 8, 9, 25; Application Exhibits 4, 5; Direct Testimony of Lerah M. Kahn; Direct Testimony of Jasmine L. Moore; Direct Testimony of Tyler M. Benedum.                             |
| Section 15(2)(d)(1)                                      | One (1) copy in portable document format on electronic storage medium and two (2) copies in paper medium of:<br>maps to suitable scale showing the location or route of the proposed construction or extension as well as the location to scale of like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of the other facilities. | Application Exhibit 4.                                                                                                                                                                                  |
| Section 15(2)(d)(2)                                      | One (1) copy in portable document format on electronic storage medium and two (2) copies in paper medium of:<br>plans and specifications and drawings of the proposed plant, equipment, and facilities.                                                                                                                                                                                           | Application Exhibits 5, 6.                                                                                                                                                                              |
| Section 15(2)(e)                                         | The manner in detail in which the applicant proposes to finance the proposed construction or extension.                                                                                                                                                                                                                                                                                           | Application at ¶¶ 12-13; Direct Testimony of                                                                                                                                                            |

|                  |                                                                                              |                                                                       |
|------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
|                  |                                                                                              | Lerah M. Kahn at pp. 5-6.                                             |
| Section 15(2)(f) | An estimated annual cost of operation after the proposed facilities are placed into service. | Application at ¶ 14;<br>Direct Testimony of<br>Lerah M. Kahn at p. 6. |

## **EXHIBIT 2**



**Commonwealth of Kentucky**  
**Michael G. Adams, Secretary of State**

Michael G. Adams  
Secretary of State  
P. O. Box 718  
Frankfort, KY 40602-0718  
(502) 564-3490  
<http://www.sos.ky.gov>

**Certificate of Existence**

Authentication number: 374859  
Visit <https://web.sos.ky.gov/ftshow/certvalidate.aspx> to authenticate this certificate.

I, Michael G. Adams, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records in the Office of the Secretary of State,

**KENTUCKY POWER COMPANY**

KENTUCKY POWER COMPANY is a corporation duly incorporated and existing under KRS Chapter 14A and KRS Chapter 271B, whose date of incorporation is July 21, 1919 and whose period of duration is perpetual.

I further certify that all fees and penalties owed to the Secretary of State have been paid; that Articles of Dissolution have not been filed; that the most recent annual report required by KRS 14A.6-010 has been delivered to the Secretary of State; and is therefore in good standing.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 30<sup>th</sup> day of July, 2026, in the 235<sup>th</sup> year of the Commonwealth.



*Michael G. Adams*

Michael G. Adams  
Secretary of State  
Commonwealth of Kentucky  
374859/0028317

**EXHIBIT 3**

**This Exhibit is a placeholder and is not required for this  
Application**

**EXHIBIT 4**





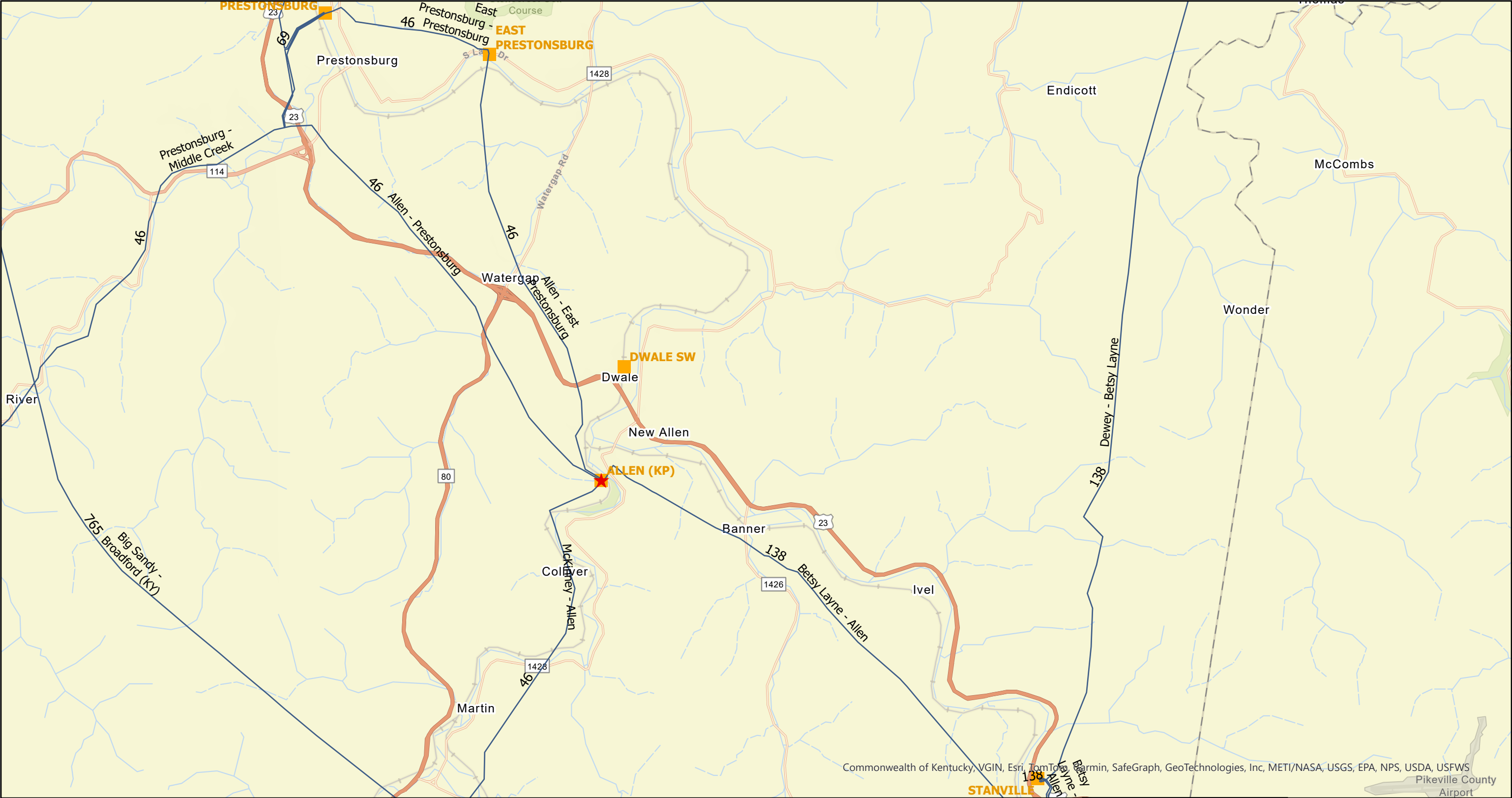
- ★ Allen Station
- Existing Transmission Lines
- ← Proposed Exits

|                                                                                                                     |  |                              |
|---------------------------------------------------------------------------------------------------------------------|--|------------------------------|
| <p>Data Sources:<br/>ESRI World Imagery Hybrid Maps Base map;<br/>AEP transmission line and Substation GIS data</p> |  | <p><b>Aerial Map</b></p>     |
| <p>Spatial Reference<br/>Name: WGS 1984 Web Mercator Auxiliary Sphere<br/>Projection: Mercator Auxiliary Sphere</p> |  | <p><b>KENTUCKY POWER</b></p> |
| <p>July 22, 2026</p>                                                                                                |  | <p>Allen Station</p>         |

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Miles





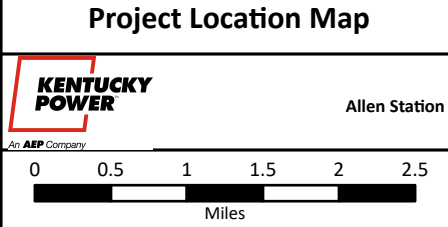
Commonwealth of Kentucky, VGIN, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS  
Pikeville County Airport

- ★ Allen Station
- Existing Transmission Lines
- Existing Stations

Data Sources:  
ESRI World Street Maps Base map;  
AEP transmission line and distribution GIS data

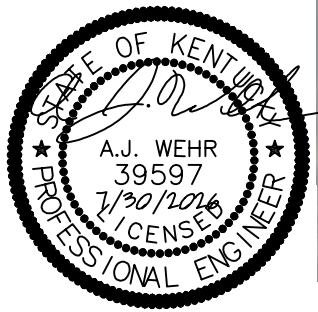
Spatial Reference  
Name: WGS 1984 Web Mercator Auxiliary Sphere  
Projection: Mercator Auxiliary Sphere

July 22, 2026



**EXHIBIT 5**





IF THIS DRAWING IS A REDUCTION  
GRAPHIC SCALE MUST BE USED

SCALE: 1" = 100'



PRELIMINARY FOR EXHIBIT ONLY

\*\*EXACT LOCATION OF EQUIPMENT AND FINAL DIMENSIONS  
SUBJECT TO CHANGE DURING DETAILED DESIGN  
NOT FOR CONSTRUCTION

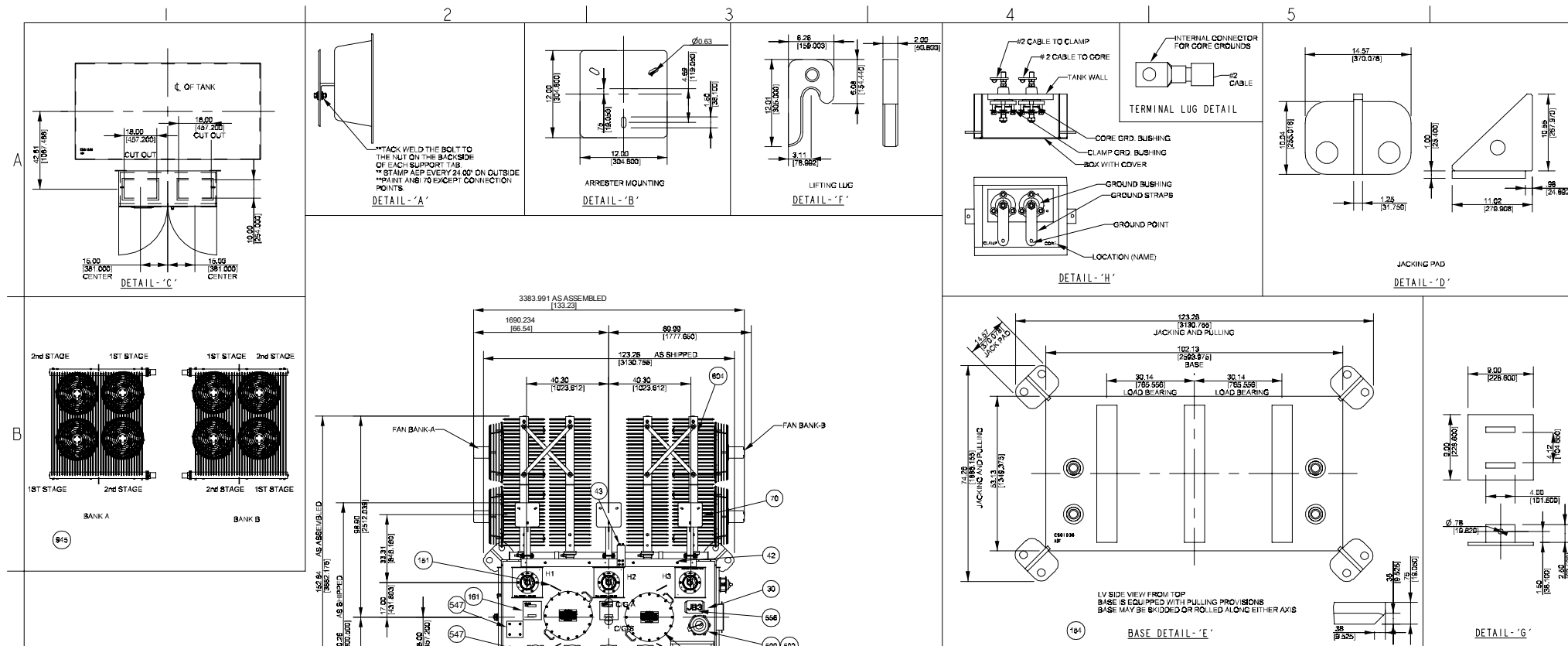
|                                                                                                                                                                                                                                                                                                                                                                                                         |                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| OLD DWG :                                                                                                                                                                                                                                                                                                                                                                                               | STD DWG :             |
| <p>"THIS DRAWING IS THE PROPERTY OF AMERICAN ELECTRIC POWER AND IS LOANED UPON CONDITION THAT IT IS NOT TO BE COPIED OR REPRODUCED, IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO ANY PERSON WITHOUT THE WRITTEN CONSENT OF AMERICAN ELECTRIC POWER, OR FOR ANY PURPOSE DETRIMENTAL TO THEIR INTEREST, AND IS TO BE RETURNED UPON REQUEST"</p> <p>1 RIVERSIDE PLAZA COLUMBUS, OH 43215</p> |                       |
| <p>KENTUCKY POWER COMPANY</p> <p>ALLEN SUBSTATION EXPANSION</p>                                                                                                                                                                                                                                                                                                                                         |                       |
| FLOYD COUNTY                                                                                                                                                                                                                                                                                                                                                                                            | KY                    |
| GENERAL ARRANGEMENT DRAWING                                                                                                                                                                                                                                                                                                                                                                             |                       |
| SCALE: AS SHOWN                                                                                                                                                                                                                                                                                                                                                                                         | VOLTAGE: 138KV        |
| INTERNAL REF:                                                                                                                                                                                                                                                                                                                                                                                           | DWG. NO. SHEET 1 OF 1 |
|                                                                                                                                                                                                                                                                                                                                                                                                         | REV 0                 |











- NOTES:
1. SEE INSTRUCTION BOOK FOR INSTALLATION AND MAINTENANCE.
  2. THIS OUTLINE CAN BE USED FOR ERECTION PURPOSES.
  3. IT IS NOT TO BE REGARDED AS INDICATING THE EXACT DETAILS OF CONSTRUCTION.
  4. THE TANK IS BRACED FOR FILLING UNDER A FULL VACUUM.
  5. BEFORE BREAKING THE SEAL ON ANY OPENING, BE SURE THE LIQUID IS LOWERED BELOW THE OPENING.
  6. DO NOT ENTER UNIT WITHOUT CHECKING OXYGEN CONTENT FOR SAFETY.
  7. CHECK OPERATION OF P OXIGEN MECHANISM BEFORE SEALING TRANSFORMER.
  8. ALL OIL VOLUME IS CALCULATED AT 25 Deg C.
  9. ALL EXTERNAL HARDWARE TO BE STAINLESS STEEL 304 WITH SILICON BRONZE NUTS.
  10. RUCK DIMENT 9.00 INCHES LONGITUDINAL, 1.75 VERTICAL, 0.86 TRANSVERSAL.
  11. ALL WEIGHTS AND DIMENSIONS ARE HAVING TOLERANCE OF 1/8" TOLERANCE.
  12. TRANSFORMER MANUFACTURED AND ASSEMBLED IN CRYSTAL SPRINGS, MS FACILITY.

|  | VENDOR             | CATALOG NO         | ITEM QTY | DESCRIPTION                                                                                                                             |
|--|--------------------|--------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|
|  | --                 | --                 | 030 1    | COVER WITH NON-SKID SURFACE                                                                                                             |
|  | --                 | --                 | 040 3    | LVN AND LV-HV ARRESTER GROUND BUS (0.25 X 4.00 COPPER BAR) SEE DETAIL A                                                                 |
|  | --                 | --                 | 041 1    | LVN BUSHING BUS (0.25 X 4.00 COPPER BAR)                                                                                                |
|  | --                 | --                 | 042 2    | LV AND HV ARRESTER GROUND BUS (ON COVER) 0.25 X 4.00 COPPER BAR)                                                                        |
|  | --                 | --                 | 043 1    | HV ARRESTER TO TANK GROUND BUS (0.25 X 4.00 COPPER BAR)                                                                                 |
|  | --                 | --                 | 070 3    | HV ARRESTER BRACKET (DETAIL-B)                                                                                                          |
|  | --                 | --                 | 100 2    | TRANSFORMER NAMEPLATE (OUTSIDE AND INSIDE CONTROL CABINET)                                                                              |
|  | --                 | --                 | 101 1    | CORE AND CORE CLAMP GROUND WARNING NAMEPLATE                                                                                            |
|  | --                 | --                 | 105 1    | DECAL, NON-PCB (stock 2250)                                                                                                             |
|  | --                 | --                 | 106 2    | Flare Protection Sticker                                                                                                                |
|  | --                 | --                 | 150 1    | CONTROL CABINET-NEMA 3R (STAINLESS STEEL 304 GRADE UNPAINTED) WITH (2) REMOVABLE PLATES 20.0 LONG X 12.0 WIDTH OVER 18.0 X 10.0 CUTOUTS |
|  | --                 | --                 | 161 4    | TRANSFORMER COVER LIFTING EYES (FOUR PLACES)                                                                                            |
|  | --                 | --                 | 152 4    | TRANSFORMER JACKPAD (FOUR PLACES) (DETAIL-E)                                                                                            |
|  | --                 | --                 | 153 6    | TRANSFORMER AND ARRESTER GROUNDING PROVISIONS (TWO 0.50-13 TAPPED ON 1.75" CENTERS) STAINLESS STEEL                                     |
|  | --                 | --                 | 164 1    | TRANSFORMER BASE (DETAIL-G)                                                                                                             |
|  | --                 | --                 | 155 4    | TRANSFORMER LIFTING FACILITIES (FOUR PLACES) (DETAIL-C)                                                                                 |
|  | --                 | --                 | 167 1    | CURRENT TRANSFORMER JUNCTION BOX                                                                                                        |
|  | --                 | --                 | 156 6    | RADIATOR SHUT-OFF VALVE - BUTTERFLY TYPE                                                                                                |
|  | --                 | --                 | 160 1    | LV ARRESTER BRACKET (BOLTED ON) (DETAIL-B)                                                                                              |
|  | --                 | --                 | 161 2    | CUSTOMER TETHER POLE MOUNTING PROVISION (DETAIL-H)                                                                                      |
|  | QUALITROL          | 213-008-06         | 600 1    | DEVICE, PRESSURE RELIEF (10 PSIG) ALARM 1 SW                                                                                            |
|  | --                 | --                 | 602 1    | SEMAPHORE, PRD                                                                                                                          |
|  | --                 | --                 | 541 1    | REDUCER, 2-1/2" INCH FOR UPPER FILTER                                                                                                   |
|  | --                 | --                 | 542 1    | PLUG, 1"                                                                                                                                |
|  | --                 | --                 | 547 1    | VACUUM CONNECTION 4.0" WITH COVER (7.25 BOLT CIRCLE)                                                                                    |
|  | QUALITROL          | 50-36E             | 560 1    | GAUGE, PRESSURE VACUUM W/ POLYCARBONATE LENS                                                                                            |
|  | QUALITROL          | ND3612B            | 562 1    | BLEEDER, PRESSURE VACUUM (+7, -8 PSI)                                                                                                   |
|  | --                 | --                 | 568 3    | HOFFMAN CONTROL BOX 8 PIN TERM BLOCK (UNPAINTED S.S.)                                                                                   |
|  | --                 | --                 | 560 3    | VALVE, 0.25 TEST                                                                                                                        |
|  | --                 | --                 | 599 3    | HV BUSHING CONNECTOR FOUR 0.56 DIA. HOLES ON 1.75" CENTERS FOR 1.60-12 STUD                                                             |
|  | --                 | --                 | 625 4    | LV & LVN BUSHING CONNECTOR FOUR 0.56 DIA. HOLES ON 1.75" CENTERS FOR 1.60-12 STUD                                                       |
|  | --                 | --                 | 616 1    | WELL, TOP LIQUID TEMPERATURE                                                                                                            |
|  | --                 | --                 | 617 1    | WELL, BOTTOM LIQUID TEMPERATURE                                                                                                         |
|  | MESSKO             | MT0-ST160RM/1UA/F  | 700 1    | GAUGE, 6.0" LIQUID LEVEL, ANSI CONN, 1 FORM C (LOW)                                                                                     |
|  | --                 | --                 | 712 2    | MANHOLE WITH BOLTED COVER (20.0 DIA OPENING)                                                                                            |
|  | --                 | --                 | 713 1    | INSPECTION OPENING ON TANK WITH BOLTED COVER (16.0 DIA OPENING)                                                                         |
|  | --                 | --                 | 740 1    | CORE AND CORE CLAMPS GROUND ENCLOSURE WITH WARNING PLATE (DETAIL-D)                                                                     |
|  | --                 | --                 | 804 6    | BRACING RADIATOR CROSS (TOP AND BOTTOM)                                                                                                 |
|  | --                 | --                 | 826 1    | QUALITROL MONITOR                                                                                                                       |
|  | OMEGA              | PR-12E-100 (1/4) S | 927 2    | 100 OHM PLATINUM RTD, FOR ITM (TOP AND BOTTOM OIL)                                                                                      |
|  | MENK/TRANTECH/TP   | --                 | 944 4    | RFS-RAD BOLT ON 1800 HT 36 EL GALVANIZED                                                                                                |
|  | KRENZ              | F26X-1A1712-S      | 945 6    | RFS COOLING FANS, 1140 RPM, 7400 CFM                                                                                                    |
|  | ABB                | 069ND412AA         | 946 3    | 95 kV, 300 kV BIL, ABB ALAMO DRY POLYMER BUSHINGS FOR HV                                                                                |
|  | ABB                | 034ND412AA         | 949 4    | 34.5 kV, 200 kV BIL, ABB ALAMO DRY POLYMER BUSHINGS FOR LV AND LVN                                                                      |
|  | QUALITROL          | 900-003-02         | 968 1    | RELAY, SUDDEN PRESSURE (ADVANCED)                                                                                                       |
|  | MILWAUKEE          | P2641-2            | 972 1    | VALVE, FLANGED GATE 2"                                                                                                                  |
|  | TJ MFG             | 47217C-05          | 973 1    | VALVE, GATE 2", HYDRAN PORT                                                                                                             |
|  | TJ MFG             | 374037-01          | 974 1    | VALVE, 2.00 DRAIN                                                                                                                       |
|  | TJ MFG             | 374037-01          | 975 1    | VALVE, 2.00 UPPER FILTER                                                                                                                |
|  | PORCELAIN PRODUCTS | #20098             | 976 2    | BUSHING, 1.2 KV CORE AND CLAMP GROUND BUSHINGS                                                                                          |
|  | SPECIALTY SWITCH   | --                 | 977 1    | DE-ENERGIZED TAP CHANGER WITH PAD LOCK PROVISIONS (SPECIAL INDEX PLATE)                                                                 |

|                        |                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| TYPE:                  | POWER TRANSFORMER                                                                                                               |
| NUMBER OF PHASE:       | THREE                                                                                                                           |
| FREQUENCY:             | 60 HERTZ                                                                                                                        |
| COOLING CLASS:         | ONAN/ONAF/ONAF/AF                                                                                                               |
| RATING:                | 121620 MVA AT 65 DEGREE C                                                                                                       |
| HV VOLTAGE:            | 48 kV (HAVING TAPS UNIFORMLY DISTRIBUTED AS:<br>48500 / MAX. POS 47450 / 0/46000 / (NOMINAL POS /<br>44600 / 54600 / MIN. POS.) |
| HV WINDING CONNECTION: | DELTA                                                                                                                           |
| HV BL:                 | 250 kV                                                                                                                          |
| LV VOLT. TAGE:         | 3.359 / 58 kV                                                                                                                   |
| LV WINDING CONNECTION: | STAR                                                                                                                            |
| LV BL:                 | 110 kV FOR LINE AND NEUTRAL                                                                                                     |

| APPROXIMATE ASSEMBLED WEIGHT                     | POUNDS | KILOGRAMS |
|--------------------------------------------------|--------|-----------|
| CORE AND COIL                                    | 26866  | 12182     |
| TANK AND FITTINGS                                | 10964  | 4974      |
| RADIATORS                                        | 3387   | 2444      |
| TANK OIL 0.30% D.3.P.C. 1714-GAL. [12651-LITERS] | 12652  | 5833      |
| RADIATOR OIL 0.30% D.3.P.C. 88-GAL. [741-LITERS] | 1942   | 881       |
| TOTAL ASSEMBLED WEIGHT                           | 56011  | 26314     |

|                             |        |           |
|-----------------------------|--------|-----------|
| APPROXIMATE SHIPPING WEIGHT | POUNDS | KILOGRAMS |
| SHIPPING UNIT               | 52842  | 24019     |
| SHIPPING PARTS              | 6168   | 2349      |
| TOTAL SHIPPING WEIGHT       | 58011  | 26314     |

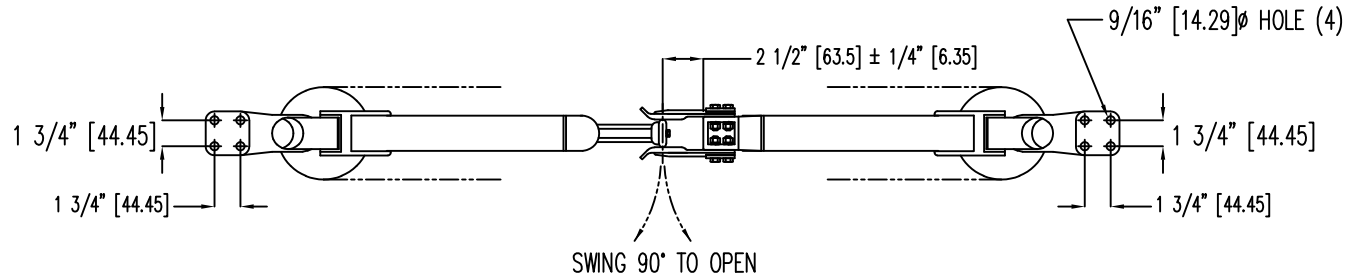
OIL REQUIRED TO COVER CORE AND COIL ASSEMBLY  
WITH RADIATORS INSTALLED 1530 GALLONS  
WITHOUT RADIATORS INSTALLED 1366 GALLONS  
HV BUSHING REMOVAL HEIGHT IS 196 INCHES [4979 mm]  
CORE AND COIL UNTANKING HEIGHT IS 218 INCHES [5538 mm]

TRANSFORMER EXTERIOR COLOR IS ANSI 70 GRAY (6 MILS).  
PAINT METHOD: IEEE C57.12.28

|                        |                                      |
|------------------------|--------------------------------------|
| ORDERING SPECIFICATION | STS-12-48-12-SPT, Rev 1              |
| SPECIFICATION NUMBER   | SS-810001, Rev 4                     |
| RATING                 | 12 / 16 / 20 MVA, 48000 / 13000 VOLT |

|                           |            |         |            |
|---------------------------|------------|---------|------------|
|                           |            |         |            |
|                           |            |         |            |
|                           |            |         |            |
|                           |            |         |            |
| 80561476                  | AEP ALLEN  | CS01036 | CS01036001 |
| P.O NO.                   | SUBSTATION | S.O NO. | SERIAL NO. |
| AMERICAN ELECTRICAL POWER |            | ABB     |            |

| M/IN EXTERNAL CLEARANCES FOR BUSHINGS PER SPEC | BETWEEN LIVE PART AND GROUND | METAL -METAL BETWEEN LIVE PARTS OF DIFFERENT PHASES | BETWEEN TOP SHEDS OF BUSHING SHEDS OF DIFFERENT PHASES |
|------------------------------------------------|------------------------------|-----------------------------------------------------|--------------------------------------------------------|
| HV (46kV, 250kV/BIL)                           | 15" (381 mm)                 | 17" (432 mm)                                        | 12" (305 mm)                                           |
| LV (13.05kV, 110kV/BIL)                        | 6.0" (153 mm)                | 6.5" (162 mm)                                       | 5.0" (127 mm)                                          |



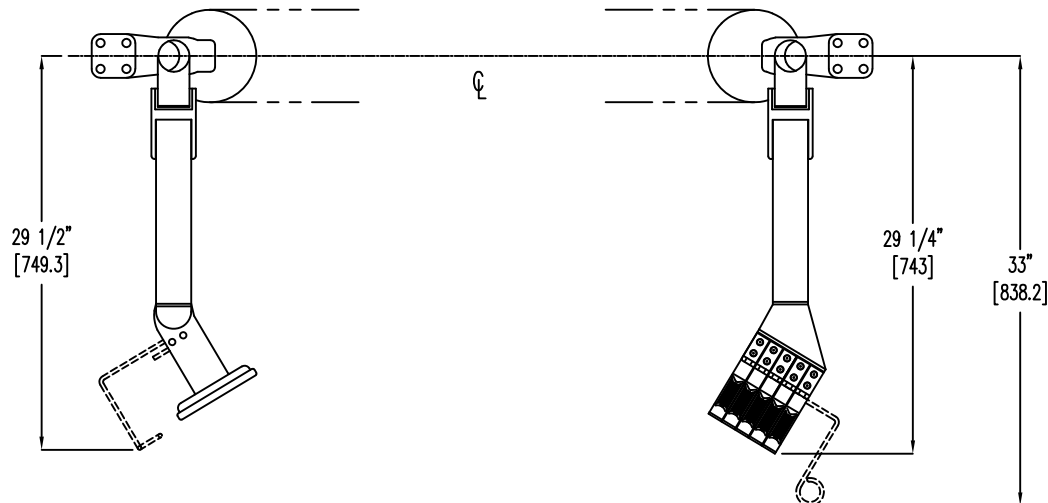
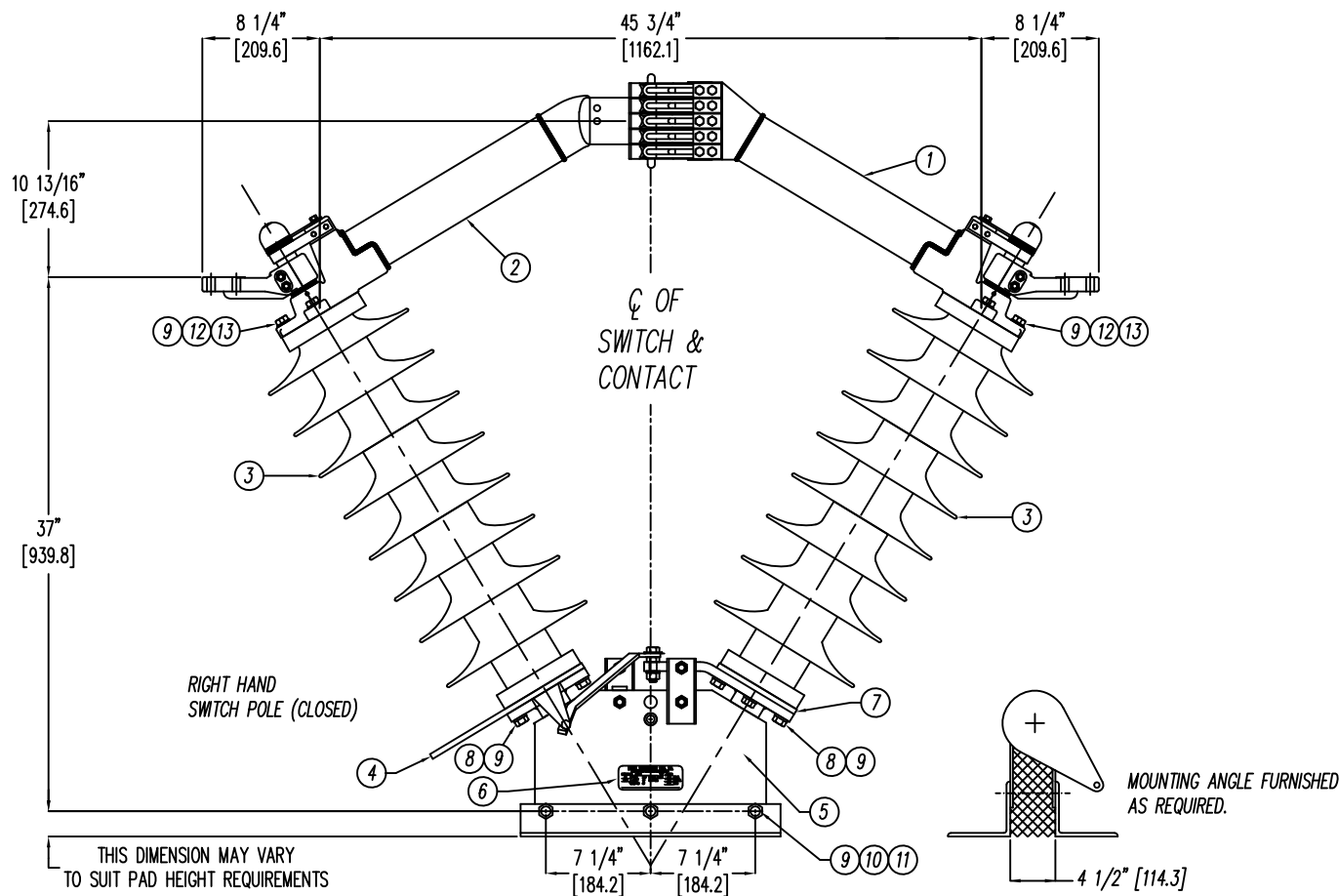
| WEIGHT TABLE                 |                    |
|------------------------------|--------------------|
| S.P.A. W/O MOUNTING ANGLES = | 196 LBS. / 88.9 KG |
| TR-278-NP INSULATOR =        | 35 LBS. / 15.9 KG  |
| LIVE PARTS =                 | 46 LBS. / 20.9 KG  |
| BASE W/O MOUNTING ANGLES =   | 80 LBS. / 36.3 KG  |

\* ALL WEIGHTS LISTED ARE APPROXIMATE \*

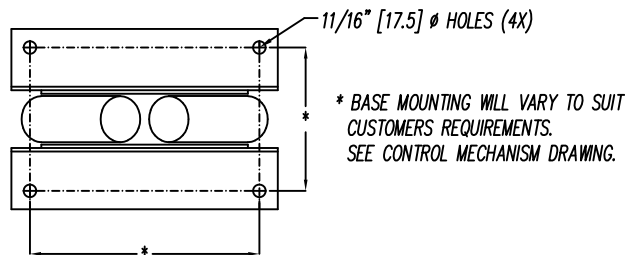
NOTE:

METRIC DIMENSIONS SHOWN IN [ ].

| BILL OF MATERIAL |                            | B-4239-AEP-NP-H |     |       |
|------------------|----------------------------|-----------------|-----|-------|
| NO.              | DESCRIPTION                | PART NO.        | QTY | CHK'D |
| 1                | CONTACT BLADE ASSEMBLY     | B-4234-E        | 1   |       |
| 2                | PLUG BLADE ASSEMBLY        | B-4233-E        | 1   |       |
| 3                | INSULATOR 350KV BIL POST   | INSTR278NPP     | 2   |       |
| 4                | LEVER                      | B-117-A         | 1   |       |
| 5                | BASE ASSEMBLY WITH SCREEN  | A-7030          | 1   |       |
| 6                | NAMEPLATE ASSY             | N08537-1        | 1   |       |
| 7                | 5" B.C. SPACER             | A-2501-C        | 1   |       |
| 8                | HEX BOLT 5/8-11NC X 2"     | G63200H         | 8   |       |
| 9                | LOCKWASHER 5/8"            | GL63            | 20  |       |
| 10               | HEX NUT 5/8-11NC           | GN6311H         | 6   |       |
| 11               | HEX BOLT 5/8-11NC X 1 1/2" | G63150H         | 6   |       |
| 12               | FLATWASHER 5/8"            | GF63125         | 6   |       |
| 13               | HEX BOLT 5/8-11NC X 1 3/4" | G63175H         | 6   |       |



| ROYAL SWITCHGEAR MFG. CO.                |              |                |        |         |
|------------------------------------------|--------------|----------------|--------|---------|
| 3995 PINE LANE SE BESSEMER ALABAMA 35022 |              |                |        |         |
| CATALOG NO.                              | AV6920AEP100 | TYPE           | AV6920 |         |
| 69 KV NOM.                               | 72.5         | KV MAX. DESIGN | 350    | KV BIL  |
| 2000 A CONT. *                           | 63           | KA 3-SEC.      | 100    | KA MOM. |
| *BASED ON                                | 53           | °C RISE        | F06    | ACCC    |
| S.O. #                                   | XXXXX        | S/N:           | XXXX   |         |



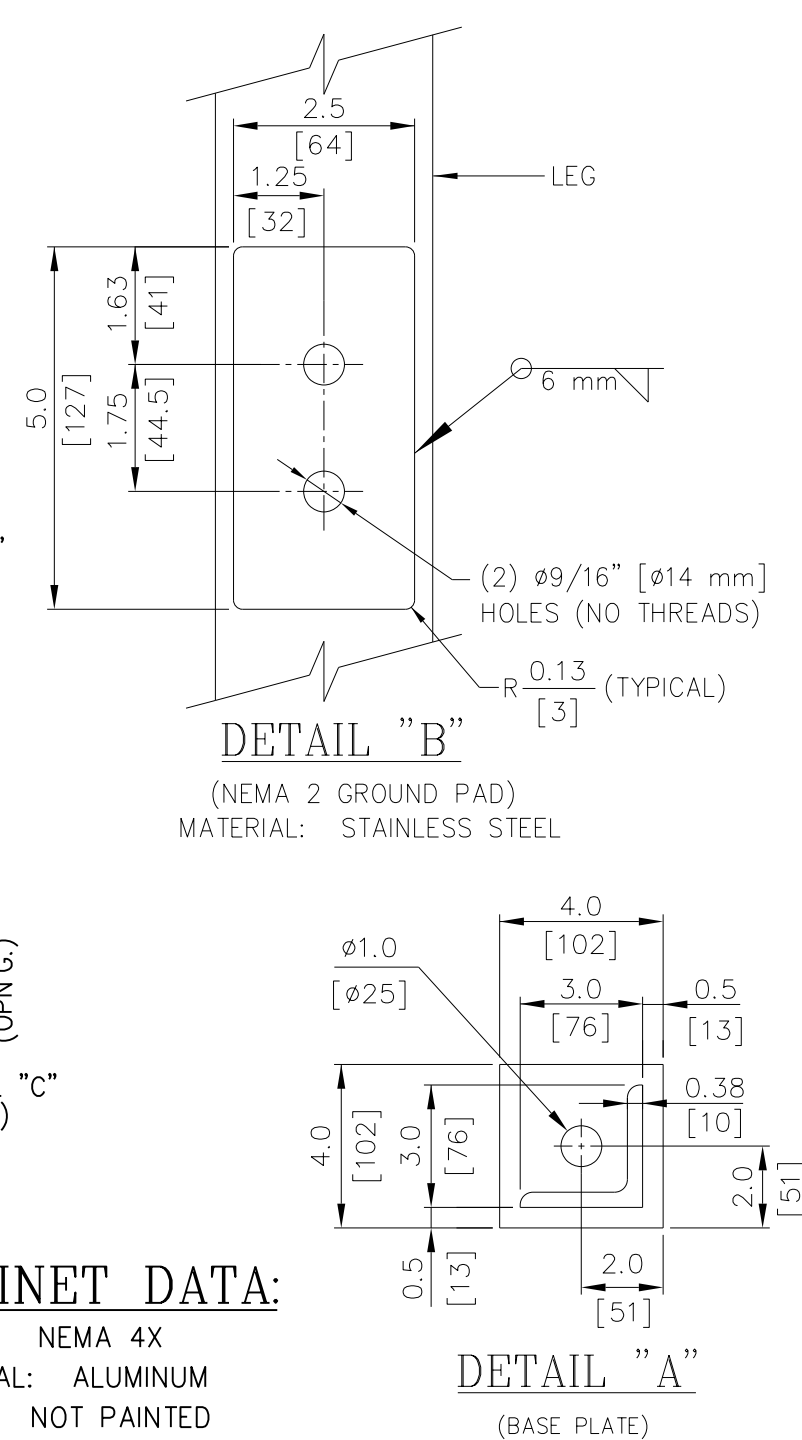
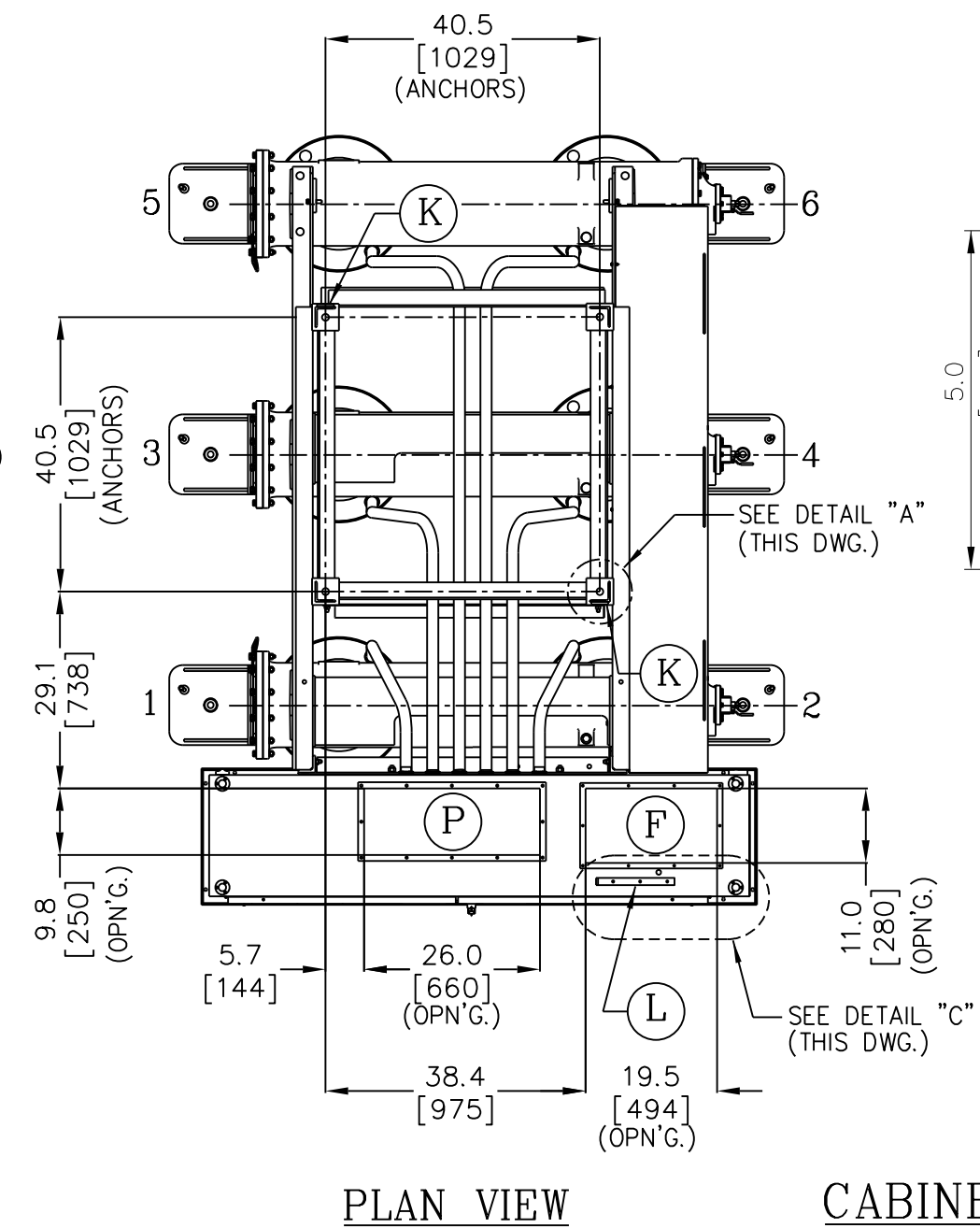
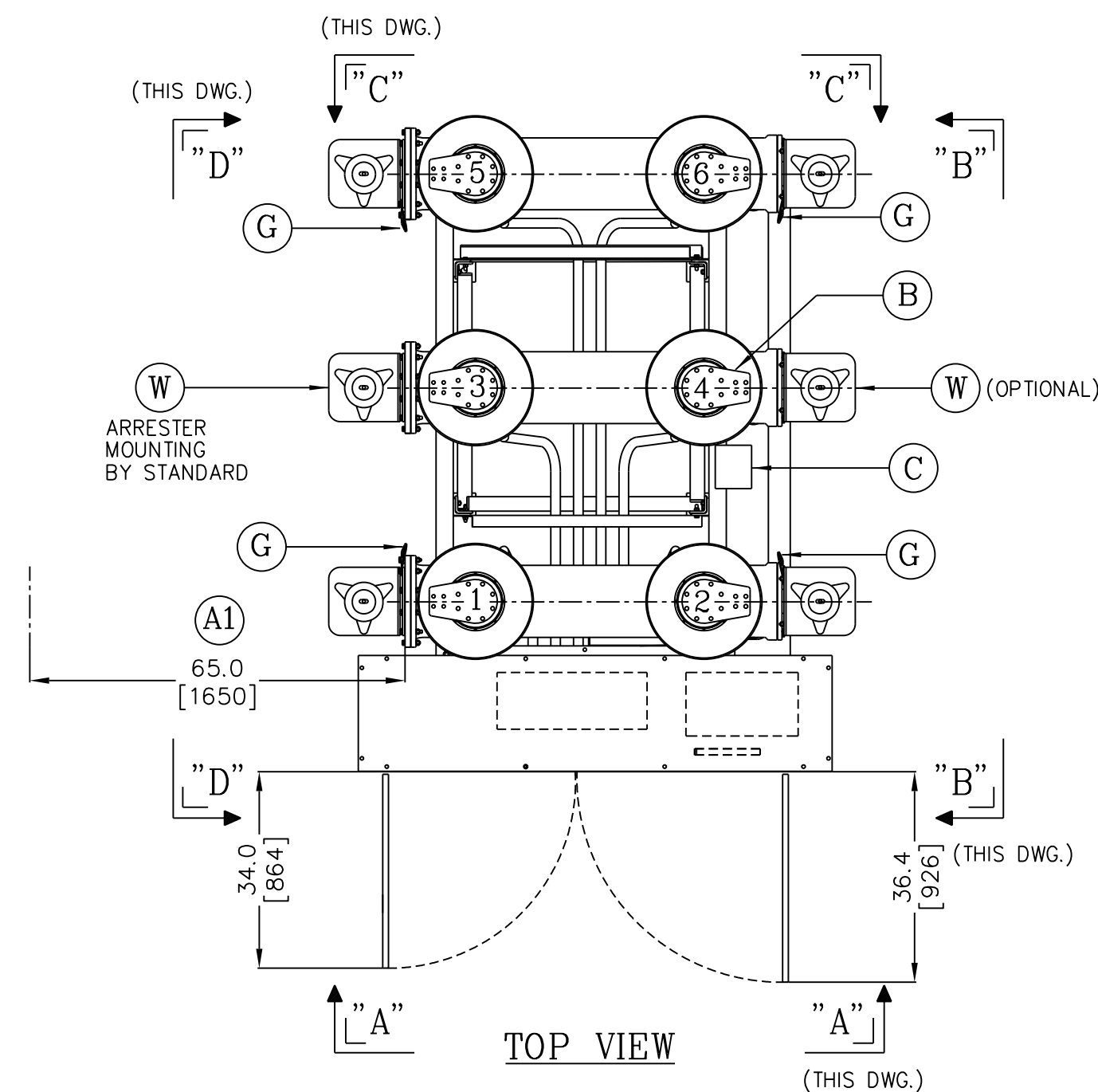
# ROYAL SWITCHGEAR MANUFACTURING CO.

3995 PINE LANE S.E., BESSEMER, ALABAMA 35022

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|--------------------------------------------------------------------|----------|-----------------|----|-----|-----|-------------------------|--|----------------------------------------------------------------------------------------------------|--|---------------------|-------|---|
| FOR:                                                               |          |                 |    |     |     | MAT:<br>SEE BOM         |  | TITLE: SINGLE POLE ALUM. V-SW ASSY. 5" B.C.<br>72.5KV (69KV) - 2000A - 100KA<br>HORIZONTAL MOUNTED |  |                     |       |   |
| THIS DRAWING<br>SUPERSEDES B4239-AEP-NP-H, ISSUE 02 DATED 06-17-08 |          |                 |    |     |     | FIN:<br>SEE BOM         |  | DRAWN: D HUHGLE DATE: 08-22-07 CHECKED: DATE:                                                      |  |                     |       |   |
|                                                                    |          |                 |    |     |     | TOLERANCE UNLESS SPEC'D |  | SCALE: NTS                                                                                         |  | ENGINEER: DATE:     |       |   |
| 03                                                                 | 11-17-08 | EC111408.1      | JA |     |     | 1 PLC DEC +/- 0.015"    |  | SIZE                                                                                               |  | PART DRAWING NUMBER | ISSUE |   |
| 02                                                                 | 06-17-08 | EC061708.2      | DH |     |     | 2 PLC DEC +/- 0.010"    |  | B                                                                                                  |  | 4239-AEP-NP-H       |       | 3 |
|                                                                    |          |                 |    |     |     | 3 PLC DEC +/- 0.005"    |  |                                                                                                    |  |                     |       |   |
| NO.                                                                | DATE     | REVISION RECORD | BY | CHK | ENG | FRACTIONS +/- 1/16"     |  |                                                                                                    |  |                     |       |   |
|                                                                    |          |                 |    |     |     | DEGREES +/- 2°          |  |                                                                                                    |  |                     |       |   |

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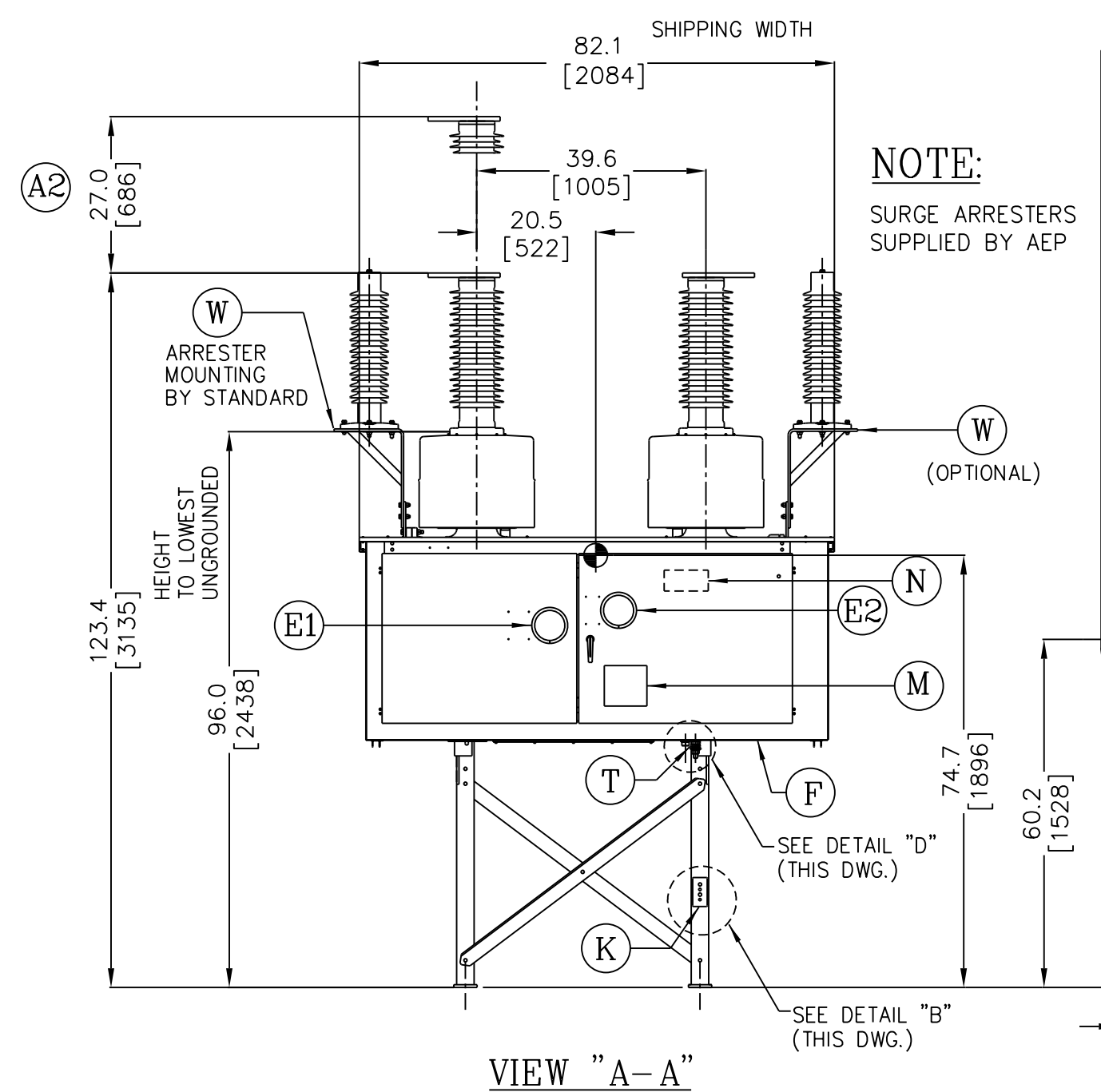


NOTES:

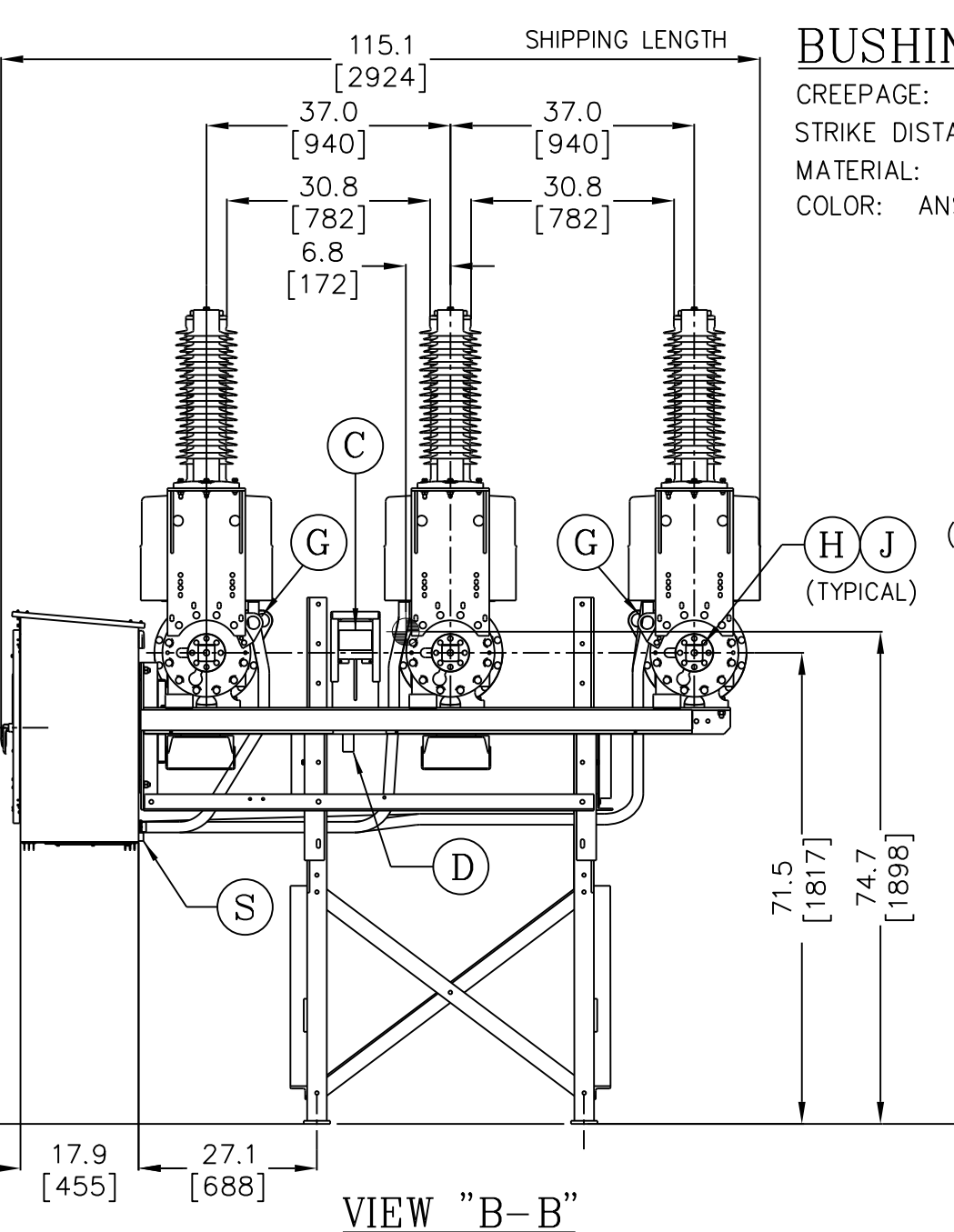
- 1) FOUR (4) 0.75" (19 mm) DIAMETER ANCHOR BOLTS REQUIRED.
  - 2) 3.0" (76 mm) MINIMUM PROJECTION ABOVE FOUNDATION.
  - 3) ANCHORING TO BE SUPPLIED BY OTHERS.
  - 4) FOUNDATION TO BE LEVEL WITHIN 0.25" (6 mm) AT FOUR (4) BASEPLATES.
  - 5) SHIM AND GROUT AS REQUIRED.
  - 6) RATED LOW SEISMIC QUALIFICATION LEVEL PER IEEE-693 2005  
(0.2g USED FOR ANCHOR BOLT CALCULATION)
  - 7) OPERATIONAL FORCES IN ANY DIRECTION = 1100 N (247 lbf)
  - 8) HV TERMINAL STATIC HORIZONTAL FORCE (LONGITUDINAL) = 750 N (169 lbf)
  - 9) HV TERMINAL STATIC HORIZONTAL FORCE (TRANSVERSE) = 500 N (112 lbf)
  - 10) HV TERMINAL STATIC VERTICAL FORCE = 750 N (169 lbf)
  - 11) TOTAL SHEAR ON EACH FOUNDATION BOLT = 2795 N (628 lbf)
  - 12) TOTAL TENSION ON EACH FOUNDATION BOLT = 12002 N (2697 lbf)
  - 13) TOTAL FOUNDATION OVERTURNING MOMENT = 22216 N-m (196626 lbf-in)
  - 14) ALL TANKS TO BE ASME U-STAMPED.
  - 15) DESIGNED FOR UP TO 135 mph WIND.
  - 16) SURGE ARRESTER BRACKET ON BUSHINGS (1-3-5) IS PROVIDED, OPTIONS FOR MOUNTING SURGE ARRESTERS ON BOTH SIDES OF THE BREAKER ARE AVAILABLE.  
ARRESTER AND GROUNDING TO ARRESTER IS IN CUSTOMER SCOPE OF WORK TO PROVIDE AND INSTALL. CIRCUIT BREAKER SHIPPED WITH UPPER PART OF ARRESTER BRACKET FOR ONE SIDE OF BREAKER AND CAN BE INSTALLED ON EITHER SIDE OF BREAKER.
  - 17) SURGE ARRESTER BRACKET ARE FOR ABB STATION CLASS ARRESTER 60kV RATED, 48kV MCOV, STYLE #Q060SA048AAEP. CAUTION WHEN USING OTHER STYLE ARRESTER.  
STANDARD IS TO INSTALL ARRESTER BRACKET ON BUSHINGS (1-3-5). AEP CID IS IS AVAILABLE TO REQUEST A SECOND SET OF 3 ARRESTER BRACKETS IF NEEDED.

LEGEND

- A1 -- MINIMUM DISTANCE FOR INTERRUPTER  
REMOVAL: (65 inches / 1650 mm)
- A2 -- MINIMUM DISTANCE FOR BUSHING  
REMOVAL: (27 inches / 686 mm)
- B -- NEMA 4--HOLE TERMINAL PAD
- C -- SF6 DENSITY MONITOR (SOLO)
- D -- SF6 FILL VALVE (DILO DN8)
- E1 -- CHARGED/DISCHARGE INDICATORS
- E2 -- OPEN/CLOSE INDICATORS & COUNTER
- F -- CABLE ENTRANCE
- G -- LIFTING LUGS
- H -- PRESSURE RELIEF (RUPTURE DISK TYPE)
- J -- MOLECULAR SIEVE
- K -- NEMA 2 GROUND PAD (DIAMETRICALLY OPPOSED)
- L -- CABINET GROUND BAR
- M -- RATINGS NAMEPLATE (EXTERNAL)
- N -- BCT NAMEPLATE (INTERNAL)
- P -- MECHANISM ACCESS PANEL
- ER. S -- 240VAC RECEPTACLE
- T -- BURNDY GB29 GROUND LUG
- U -- FORK LIFTING POCKET
- W -- ARRESTER BRACKET
-  -- CENTER OF GRAVITY



NOTE:  
SURGE ARRESTERS  
SUPPLIED BY AEP

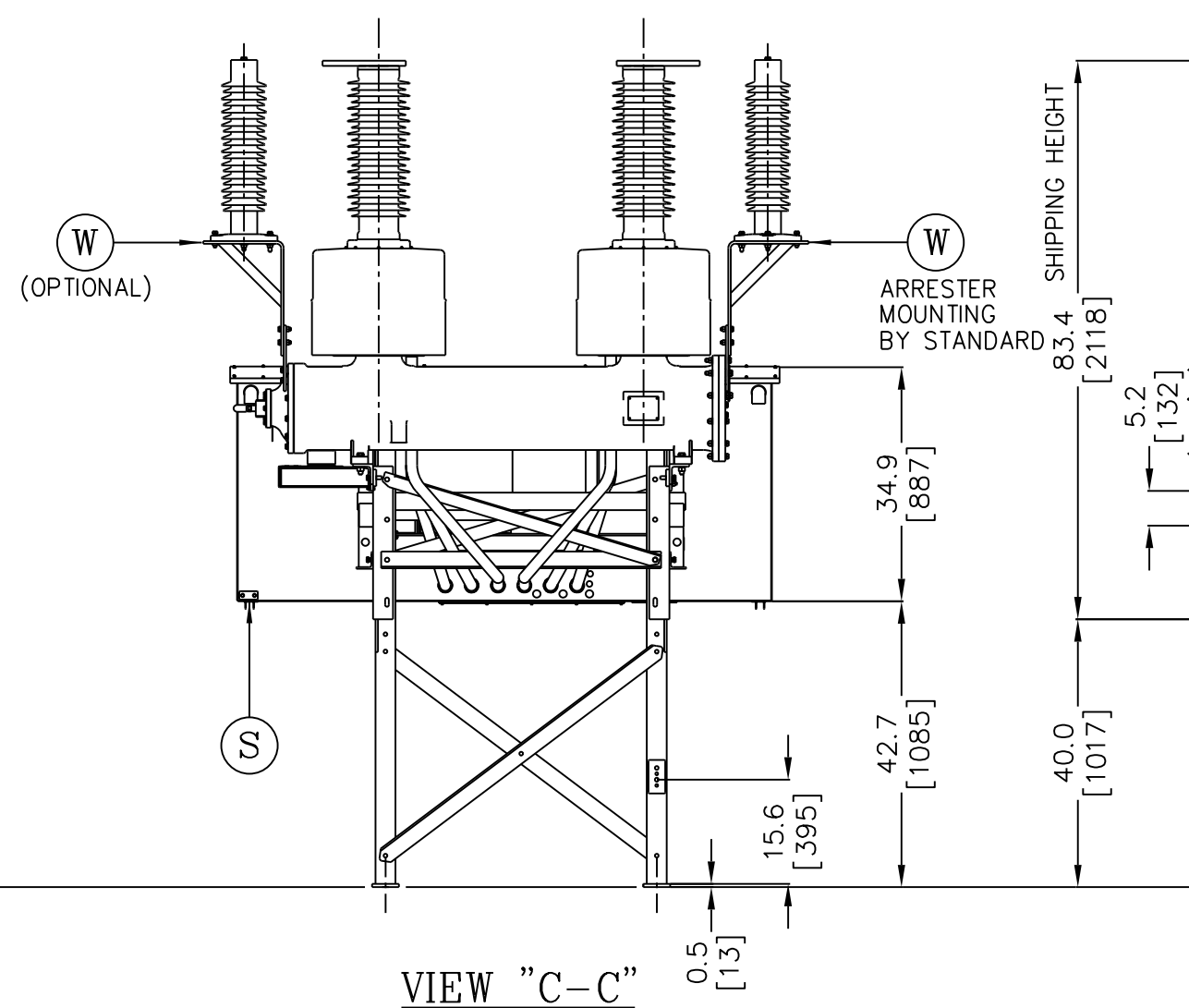


CABINET DATA:

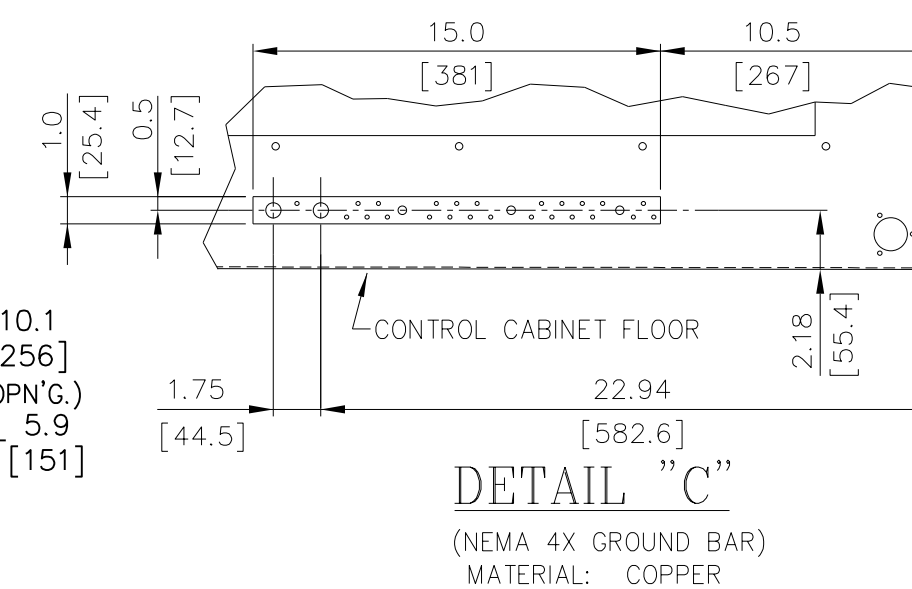
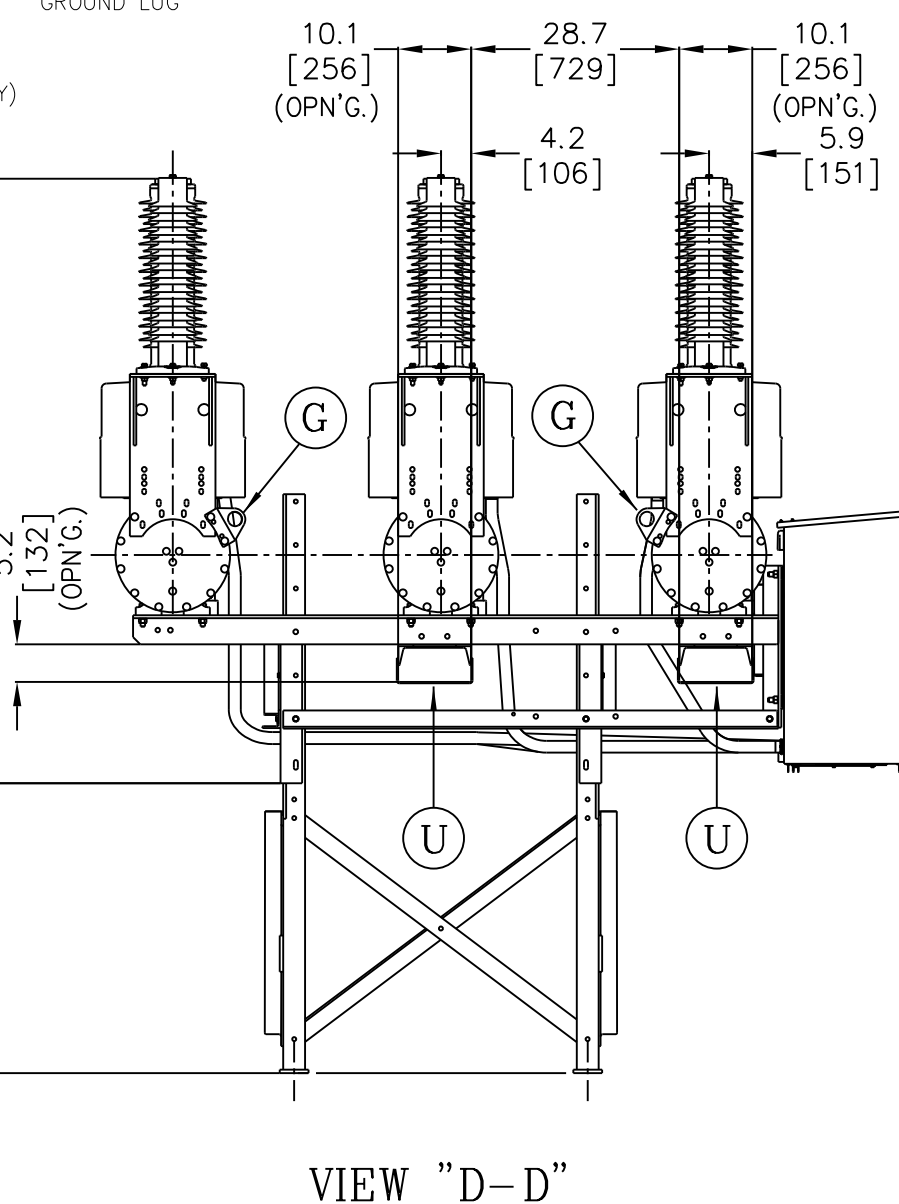
RATING: NEMA 4X  
MATERIAL: ALUMINUM  
COLOR: NOT PAINTED

BUSHING DATA

CREEPAGE: 79.9" (2029 mm)  
STRIKE DISTANCE: 24.0" (610 mm)  
MATERIAL: COMPOSITE  
COLOR: ANSI 70 GRAY



DETAIL "D"  
(GROUND BAR SITE ASSEMBLY)



|                                |               |
|--------------------------------|---------------|
| TYPE:                          | DT1-72.5FK F1 |
| IMPULSE<br>WITHSTAND:          | 350 kV        |
| MAXIMUM<br>VOLTAGE:            | 72.5 kV       |
| INTERRUPTER<br>CURRENT RATING: | 40 kA         |
| CURRENT<br>RATING:             | 3000 A        |

DIMENSIONS:  $\frac{\text{INCHES}}{\text{mm}}$

|                        |                                 |
|------------------------|---------------------------------|
| 2,700 lbs (1,225 kg)   | -- BREAKER WEIGHT               |
| 29 lbs ( 13 kg)        | -- SF6 GAS WEIGHT               |
| + 1,740 lbs ( 789 kg)  | -- CT WEIGHT (12) 1200/5 CTs    |
| + 1,944 lbs ( 882 kg)  | -- CT WEIGHT (12) 2000/5 CTs    |
| + 1,212 lbs ( 550 kg)  | -- CT WEIGHT (12) 3000/5 CTs    |
| = 4,469 lbs (2,027 kg) | -- TOTAL WEIGHT(12) 1200/5 CTs  |
| = 4,673 lbs (2,120 kg) | -- TOTAL WEIGHT (12) 2000/5 CTs |
| = 3,941 lbs (1,788 kg) | -- TOTAL WEIGHT (12) 3000/5 CTs |

|                 |                                                 |         |            |            |                                                                                                                                                                                                      |                                |                                  |            |
|-----------------|-------------------------------------------------|---------|------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------|------------|
|                 |                                                 |         |            |            | CUSTOMER: AEP<br>CUSTOMER ORDER No.:<br>SUBSTATION:<br>SERIAL No.:                                                                                                                                   |                                | MATERIAL ID:<br>CCDT1-72.5FK-033 |            |
| 3               | UPDATED BREAKER OUTLINE PER CUSTOMER'S COMMENTS | W. HOLT | A. LISITSA | 10/31/2019 |                                                                                                                                                                                                      |                                |                                  |            |
| 2               | ADDED OPTIONAL ARRESTER BRACKET NOTATION        | W. HOLT | A. LISITSA | 09/30/2019 |                                                                                                                                                                                                      |                                |                                  |            |
| 1               | ADDED CUSTOMER-REQUESTED NOTATION               | W. HOLT | A. LISITSA | 07/29/2019 |                                                                                                                                                                                                      |                                |                                  |            |
| REV.            | DESCRIPTION                                     | DRAWN   | CHECKED    | DATE       | CUSTOMER EQ. NO.: DT1-72.5FK F1, 3000A, 48VDC--125VDC--250VDC                                                                                                                                        |                                | ORDER No.<br>X                   |            |
| OUTLINE DRAWING |                                                 | W. HOLT | A. LISITSA | 05/14/2019 |  <div>           Grid Solutions<br/>           One Power Lane<br/>           Charleroi, PA 15022         </div> | DRAWING No.: M279006-DT09CX_LA |                                  | SHT 1 OF 1 |
|                 |                                                 | DRAWN   | CHECKED    | DATE       |                                                                                                                                                                                                      |                                |                                  |            |

## OUTLINE DRAWING

A

|         |            |            |
|---------|------------|------------|
| W. HOLT | A. LISITSA | 05/14/2019 |
| DRAWN   | CHECKED    | DATE       |

B



Grid Solutions  
One Power Lane  
Charleroi, PA 15022

DRAWING No.: M279006-DT09CX\_LA

C

|                                  |
|----------------------------------|
| MATERIAL ID:<br>CCDT1-72.5FK-033 |
|----------------------------------|

|           |
|-----------|
| ORDER No. |
| X         |

SHT 1 OF 1

D

1 OF 1

1

1

2

2

3

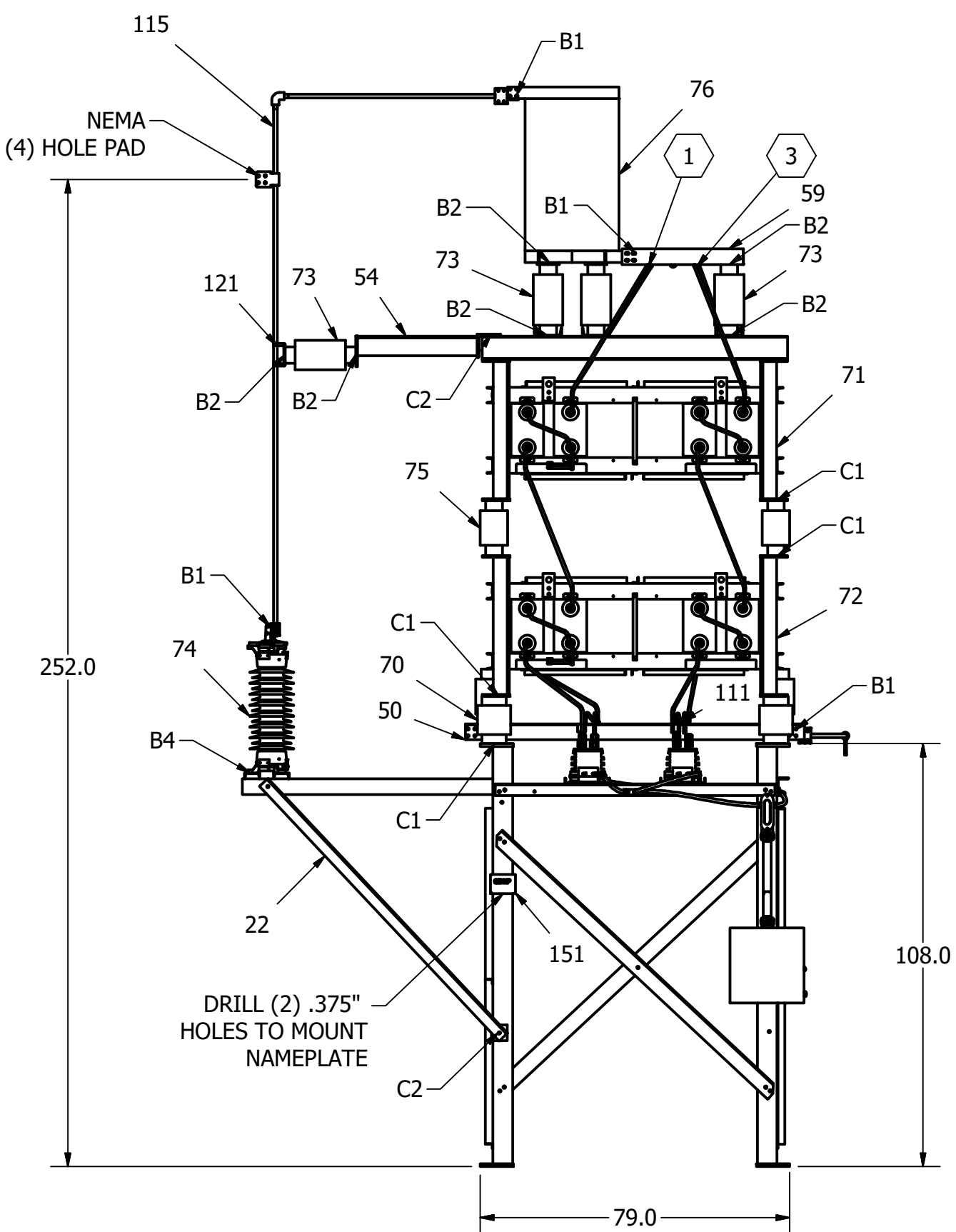
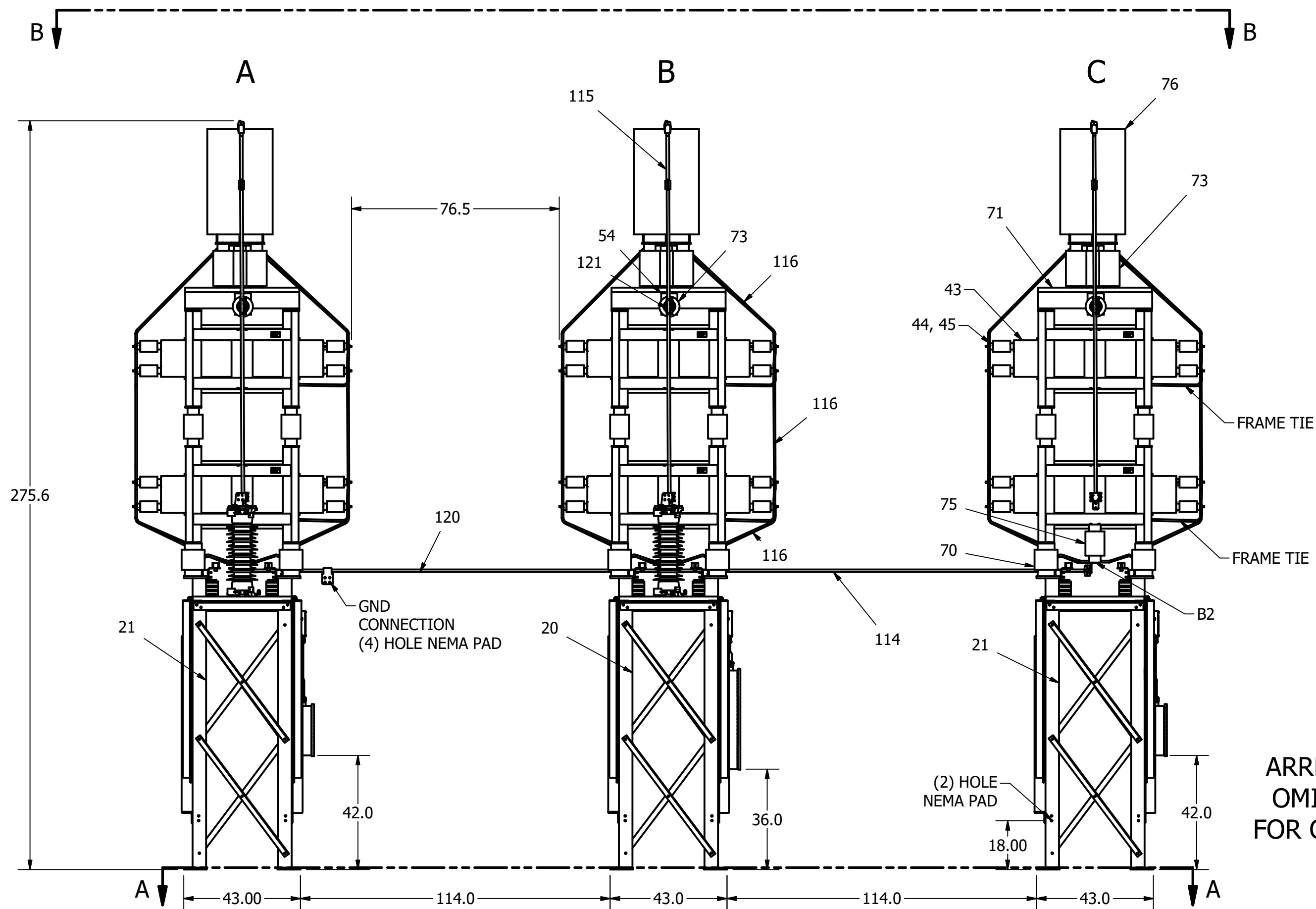
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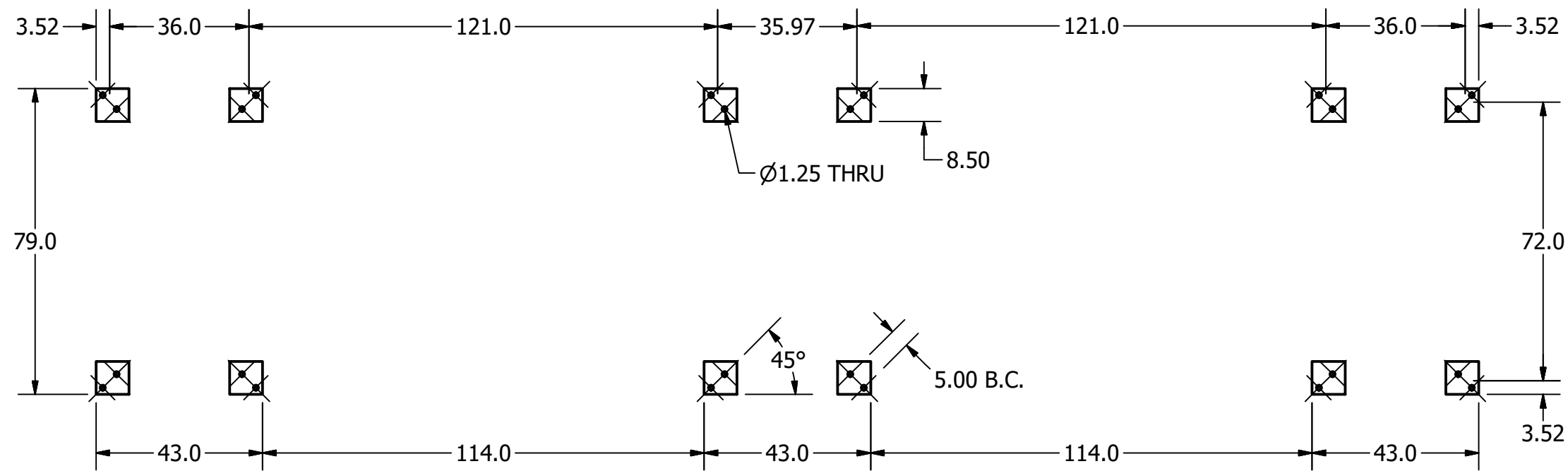
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| REVISION HISTORY |             |      |    |
|------------------|-------------|------|----|
| REV              | DESCRIPTION | DATE | BY |
|                  |             |      |    |



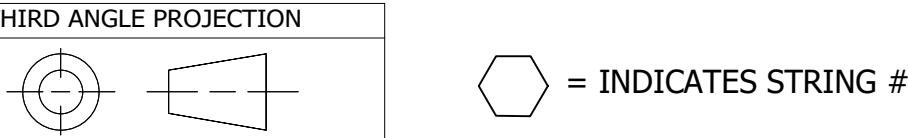
ARRESTER  
OMITTED  
FOR CLARITY



| TOTAL WIND LOADS    |        |          |
|---------------------|--------|----------|
| TOTAL STACK WEIGHT: | 5,500  | lbs.     |
| TOTAL AREA:         | 84     | sq. ft.  |
| CENTER OF AREA:     | 123    | in.      |
| WIND VELOCITY:      | 135    | mph      |
| WIND PRESSURE:      | 44.6   | psf      |
| TOTAL WIND FORCE:   | 5,370  | lbs.     |
| OVERTURNING MOMENT: | 55,030 | ft.-lbs. |
| MOMENT / LEG:       | 0      | ft.-lbs. |
| UPLIFT / LEG:       | 8,900  | lbs.     |
| BEARING / LEG:      | 11,400 | lbs.     |
| SHEAR / LEG:        | 1,600  | lbs.     |

NOTES:

1. CAPACITOR UNITS CONTAIN A CLASS 3B COMBUSTIBLE LIQUID (REFER TO UNIT NAMEPLATE FOR AMOUNT). THIS FACT MUST BE RECOGNIZED WHEN CHOOSING THE LOCATION AND PROTECTION FOR THE EQUIPMENT
2. TREAT ALUMINUM CONTACT SURFACES WITH PENETROX-A, WIRE BRUSH OR RUB WITH EMERY CLOTH, WIPE OFF EXCESS AFTER ASSEMBLY
3. NS = NEAR SIDE, FS = FAR SIDE, BC = BOLT CIRCLE
4. SEE GEH 7249 FOR INSTALLATION.
5. RE-TORQUE ALL BUSHING TERMINAL CONNECTIONS TO 20 FT-LBS PRIOR TO ENERGIZING EQUIPMENT.
6. WHEN INSTALLING RACKS, ALIGN RACK NAME PLATES.
7. FRAME TIE JUMPERS SHALL REMAIN CONNECTED TO THE BANK AT ALL TIMES AND SHALL NOT BE ADJUSTED. IF REMOVING STRINGS FROM A BANK DO NOT REMOVE THE STRING WITH THE FRAME TIE JUMPER.
8. REFERENCE DRAWING NO. 154D3448EC FOR WIRING DIAGRAM.



| BOLT SCHEDULE |                 |      |     |           |           |            |            |
|---------------|-----------------|------|-----|-----------|-----------|------------|------------|
| CODE          | DESCRIPTION     | BOLT | NUT | REG. WASH | SPG. WASH | BELLEVILLE | BEVEL WASH |
| B1            | 0.500-13 X 1.75 | 26   | 26  | 26        |           | 26         |            |
| B2            | 0.500-13 X 1.00 | 96   |     | 96        | 96        |            |            |
| B3            | 0.500-13 X 1.25 | 12   | 12  |           | 12        |            | 12         |
| B4            | 0.500-13 X 2.50 | 12   | 12  | 12        | 12        |            |            |
| C1            | 0.625-11 X 1.50 | 288  |     | 576       | 288       |            |            |
| C2            | 0.625-11 X 2.00 | 18   | 18  |           | 18        |            |            |

|                                                                                                                                                                                       |                  |                                                                                                                                                                                                                                                                    |                      |                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------|
|                                                                                                                                                                                       |                  | 650                                                                                                                                                                                                                                                                | 5,500 lbs. PER STACK |                                                                  |
| BANK NAME PLATE                                                                                                                                                                       |                  | KV BIL                                                                                                                                                                                                                                                             | APPROX. BANK WT.     |                                                                  |
|  <b>GE CAPACITOR EQUIPMENT</b>                                                                   |                  | UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                                                         |                      | SIGNATURES<br>DATE                                               |
| CAT. 36F6129103 MFG DATE<br>KVAR 43200/28800T VOLTAGE 69000<br>HERTZ 60 PHASE 3 CONN. WYE<br>SERIAL NO.<br>CONN. DIAG. 154D3446CC<br>OPERATED: 19200/12800 kVAR @ 46.0kV<br>AEP CID # |                  | DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL. DECIMALS ±<br>3 PL. DECIMALS ±<br>ANGLES ±<br>FRACTIONS ±                                                                                                                                                      |                      | DRAWN 212445893 4/22/2019<br>CHECKED<br>ENGR 208002965 4/22/2019 |
| CAUTION! CAPACITOR UNITS CONTAIN CLASS III B COMBUSTIBLE<br>LIQUID. BEFORE INSTALLING OR OPERATING READ INST.                                                                         |                  | RECOMMENDED TORQUE VALUES<br>(GALV. STEEL HARDWARE, DRY)<br>0.250"-20 BOLTS - 4 FT - LBS<br>0.375"-16 BOLTS - 16 FT - LBS<br>0.500"-13 BOLTS - 38 FT - LBS<br>CAP BUSHING TORQUE - 20 FT - LBS.<br>0.625"-11 BOLTS - 98 FT - LBS<br>0.750"-10 BOLTS - 157 FT - LBS |                      | ISSUED                                                           |
| CAPACITOR UNITS INCLUDE INTERNAL DISCHARGE RESISTORS                                                                                                                                  |                  | INVENTOR                                                                                                                                                                                                                                                           |                      |                                                                  |
| ○ NP80567                                                                                                                                                                             | CLEARWATER, F.L. | MADE IN U.S.A. ○                                                                                                                                                                                                                                                   |                      |                                                                  |

| PARTS LIST |     |                  |                                                       |
|------------|-----|------------------|-------------------------------------------------------|
| ITEM       | QTY | PART NUMBER      | DESCRIPTION                                           |
| 20         | 1   | 36F6129103 SUB B | SUBSTRUCTURE 9', 36" x 72" B.C.                       |
| 21         | 2   | 36F6129103 SUB   | SUBSTRUCTURE 9', 36" x 72" B.C.                       |
| 22         | 3   | 36F6131          | 36F6131 ARRESTER SHELF                                |
|            |     | ARRESTER SHELF   |                                                       |
| 71         | 3   | 36F6129132       | STACK RACK 2400 KVAR 19.92KV                          |
| 72         | 3   | 36F6129131       | STACK RACK 3600 KVAR 29.88KV                          |
| 43         | 48  | 98L1242WC29      | HV CAP, 600KVAR, 9960V, 60HZ, 1PH, 150KVBL, 2-24" CRP |
| 44         | 96  | 614A507000045    | TERM CAP, CAPACITOR                                   |
| 45         | 90  | 614A507000044    | TERM CAP, SLEEVE ID 2.292 +/- .02                     |
| 50         | 3   | 186C372300359    | L - 4" x 3" x .25" x 108.54"                          |
| 54         | 3   | 186C372300017    | INSULATOR SUPPORT                                     |
| 59         | 3   | 186C372300360    | L - 4" x 3" x .25" x 31"                              |
| 70         | 12  | 115A161800710    | INSULATOR, TR225, 110 KVBL, HS                        |
| 73         | 18  | 115A161800703    | INSULATOR, TR210, 200 KVBL, SS                        |
| 74         | 3   | 9L11HMA0455      | ARRESTER, GE, 36.5KV MCOV RATED                       |
| 75         | 18  | 115A161800702    | INSULATOR, TR208, 150 KVBL, SS                        |
| 76         | 3   | 128A154000390    | REACTOR, 69KV, .4mH, 400A, 20 KA BX18521-2            |
| 111        | 20  | 111X604000002    | PARALLEL GROOVE W/ HARDWARE                           |
| 114        | 1   | 223B1470AE003    | 1" AL. SPS ASSEMBLY - 158"                            |
| 115        | 3   | 223B1470AE005    | 1" AL. SPS ASSEMBLY - 135.50"                         |
| 116        | 240 | BTDS             | CABLE, 2 AWG, 2.4KV 75TR                              |
| 120        | 1   | 223B1470AE002    | 1" AL. SPS ASSEMBLY - 158"                            |
| 121        | 3   | 308A042900083    | 1" PIPE TO INSULATOR ADAPTER, 3" B.C.                 |
| 151        | 1   | 147A771200001    | KIT-NP ASM, STAMP PER DL                              |
| 152        | 1   | DTAAU410         | COMPOUND, PENETROX A 8 OZ CON                         |

PURCHASER **AEP**

|           |         |
|-----------|---------|
| ORDER NO. | GE SO#. |
|-----------|---------|

PROJECT

|         |            |
|---------|------------|
| DWG NO. | 154D3446CC |
|---------|------------|

 **GE ENERGY**  
CLEARWATER, F.L., U.S.A.

## STACK RACK ASSEMBLY

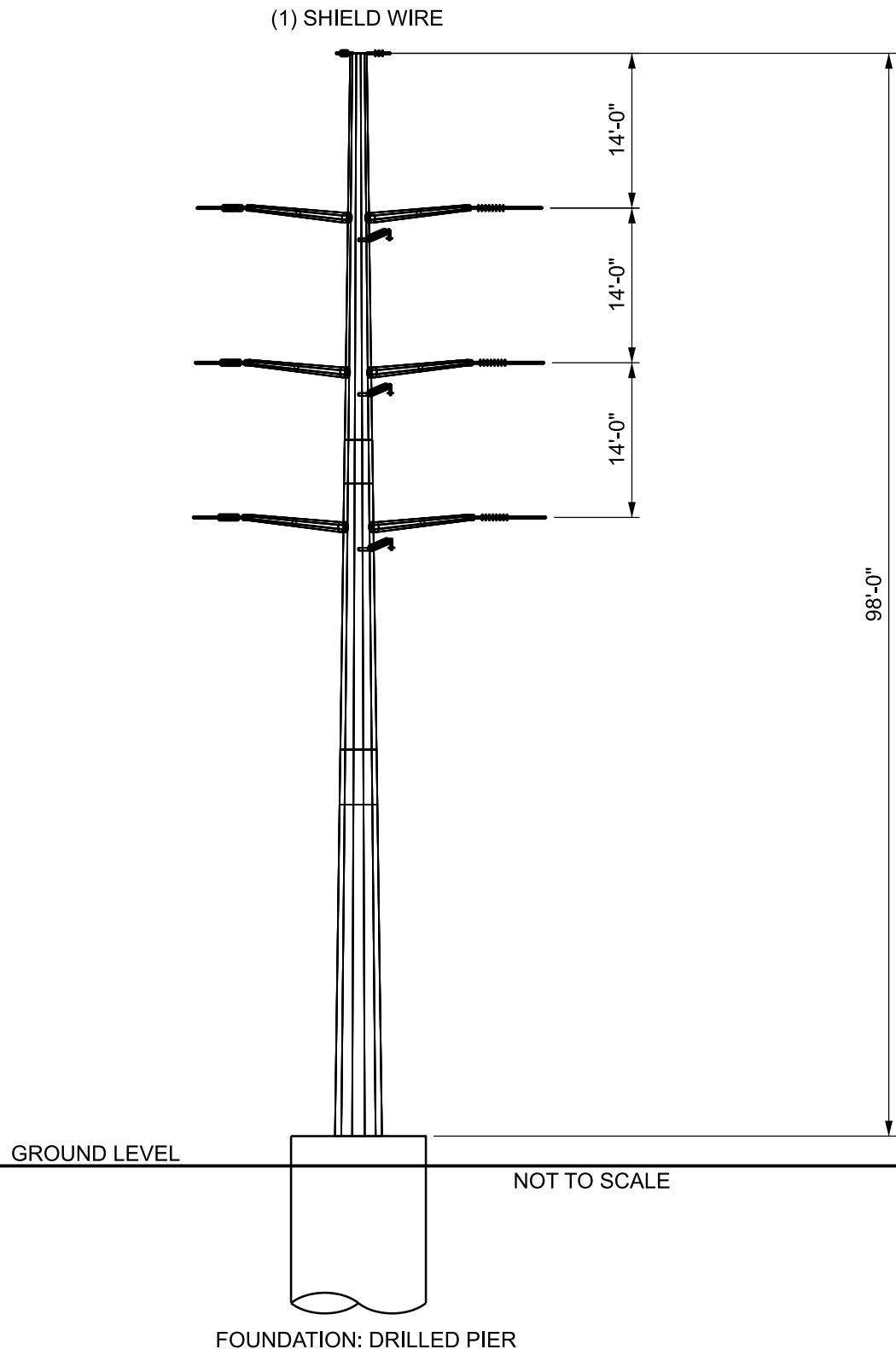
## CAPACITOR EQUIPMENT

FIRST MADE FOR: 36F6129103

|           |  |            |            |
|-----------|--|------------|------------|
| SIZE<br>D |  | 154D3446CC |            |
|           |  | SHEET 1    | CONT<br>ON |



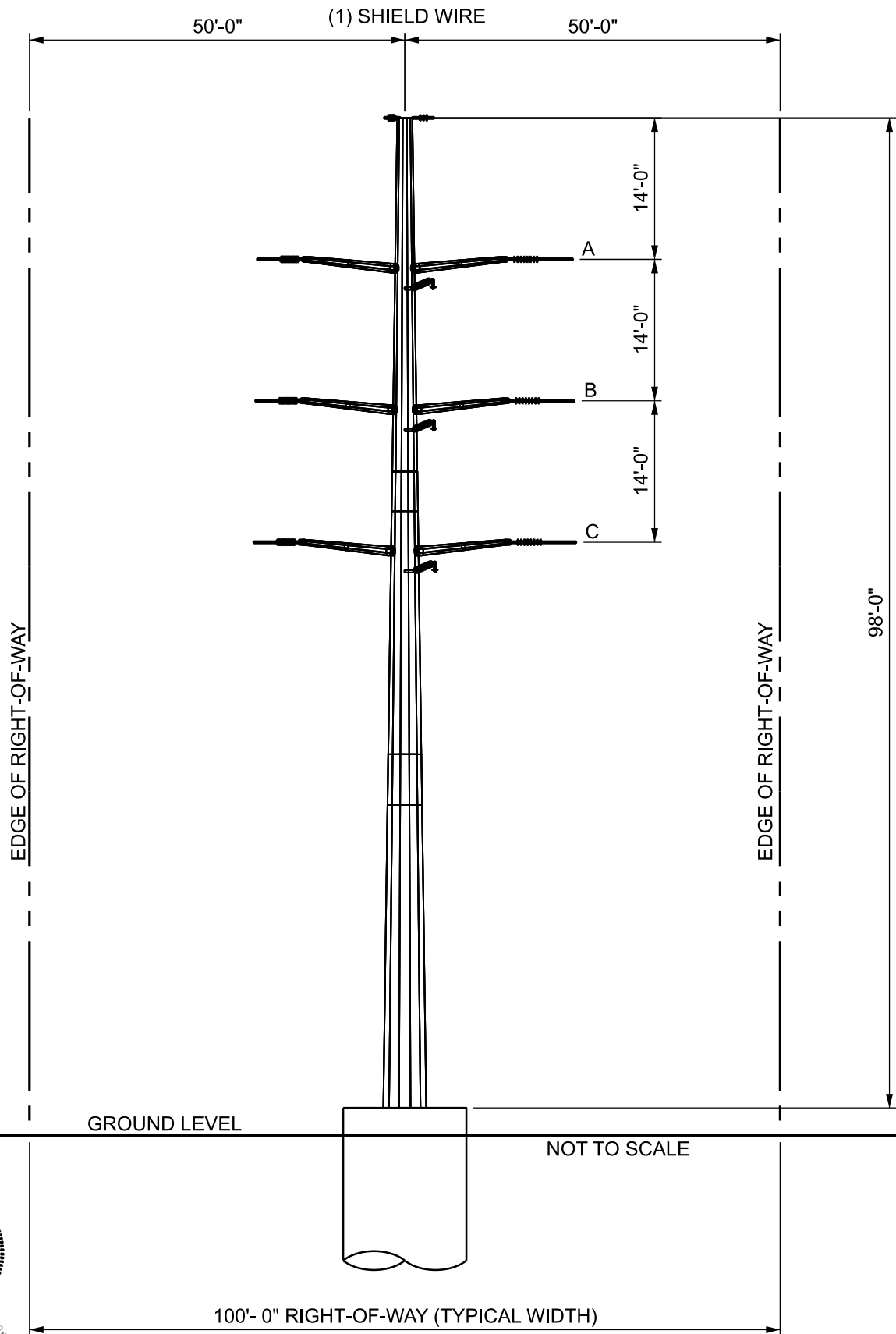
# STEEL MONOPOLE DAVIT ARM DEAD-END (SINGLE CIRCUIT)



*Brian S. Dulle*  
 THE SEAL APPEARING ON THIS DOCUMENT WAS  
 AUTHORIZED BY BRIAN S. DULLE, P.E. 37141 ON  
 06/19/2026 AND APPLIES ONLY TO THE REVISION  
 NOTED ON THIS DATE.

TYPICAL SCHEMATIC

# STEEL MONOPOLE DAVIT ARM DEAD-END (SINGLE CIRCUIT)

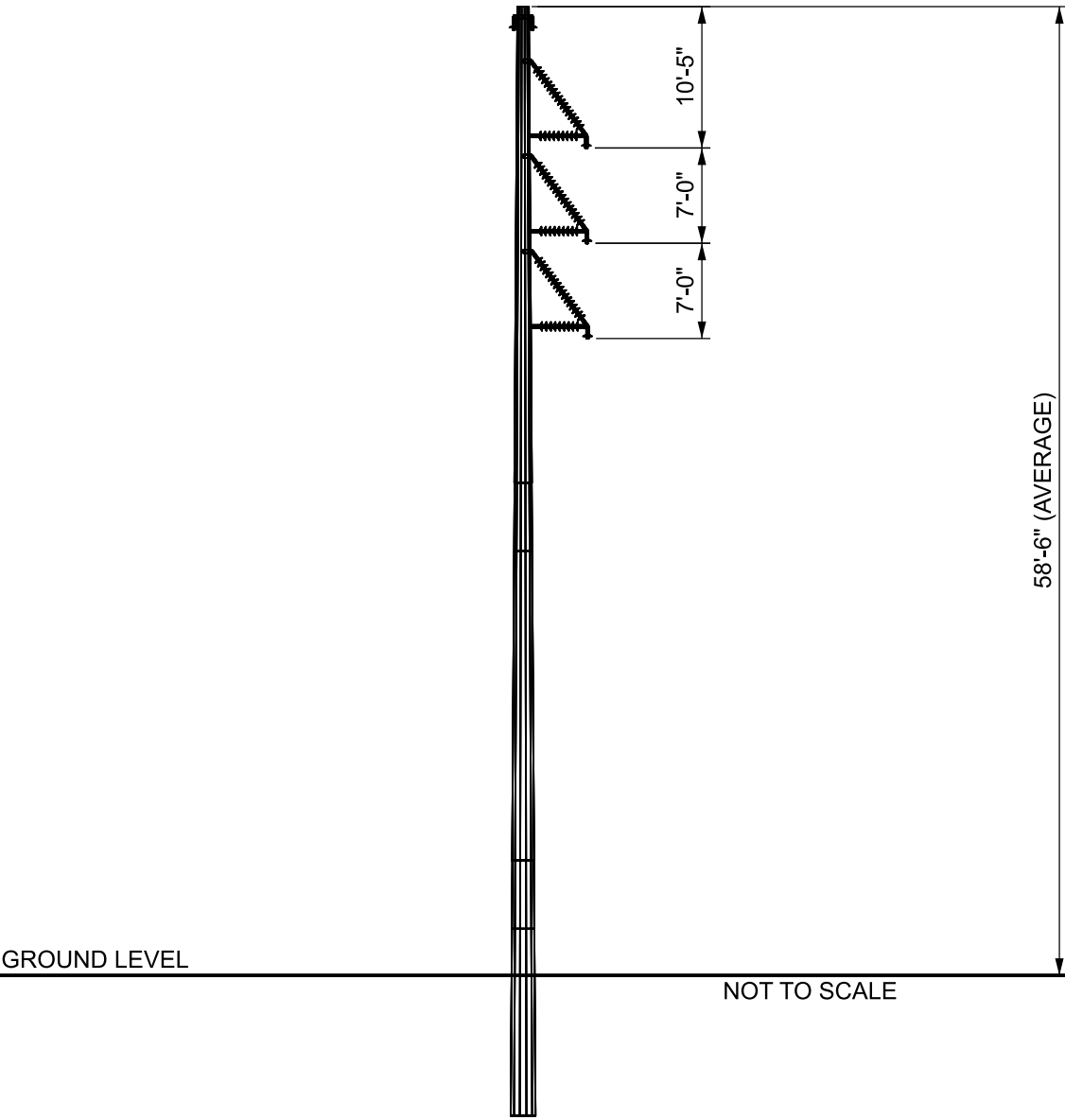


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TYPICAL RIGHT-OF-WAY CROSS SECTION



(2) SHIELD WIRES



GROUND LEVEL

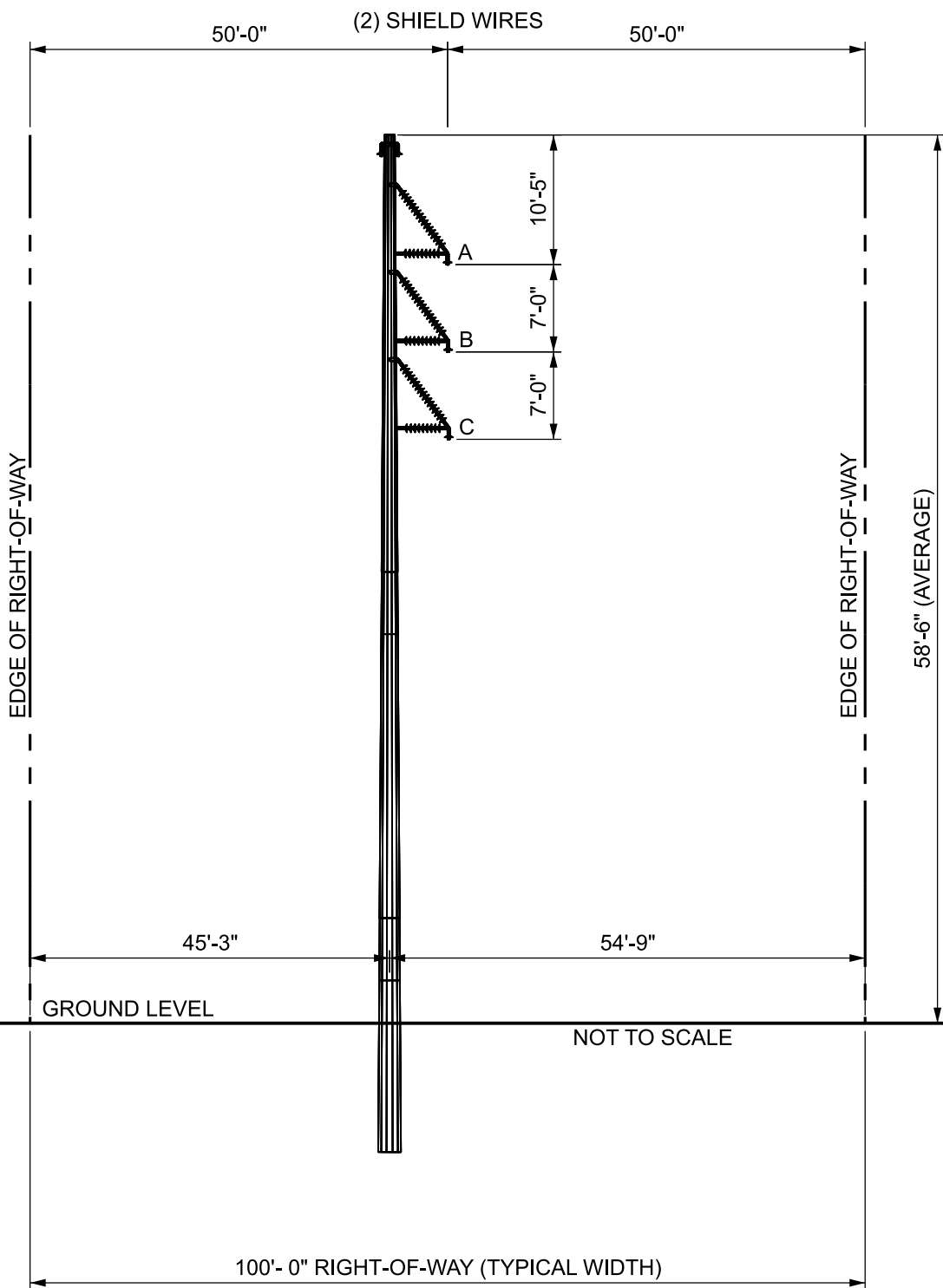
NOT TO SCALE

FOUNDATION: DIRECT EMBEDDED  
(12'-4" AVERAGE DEPTH)



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TYPICAL SCHEMATIC

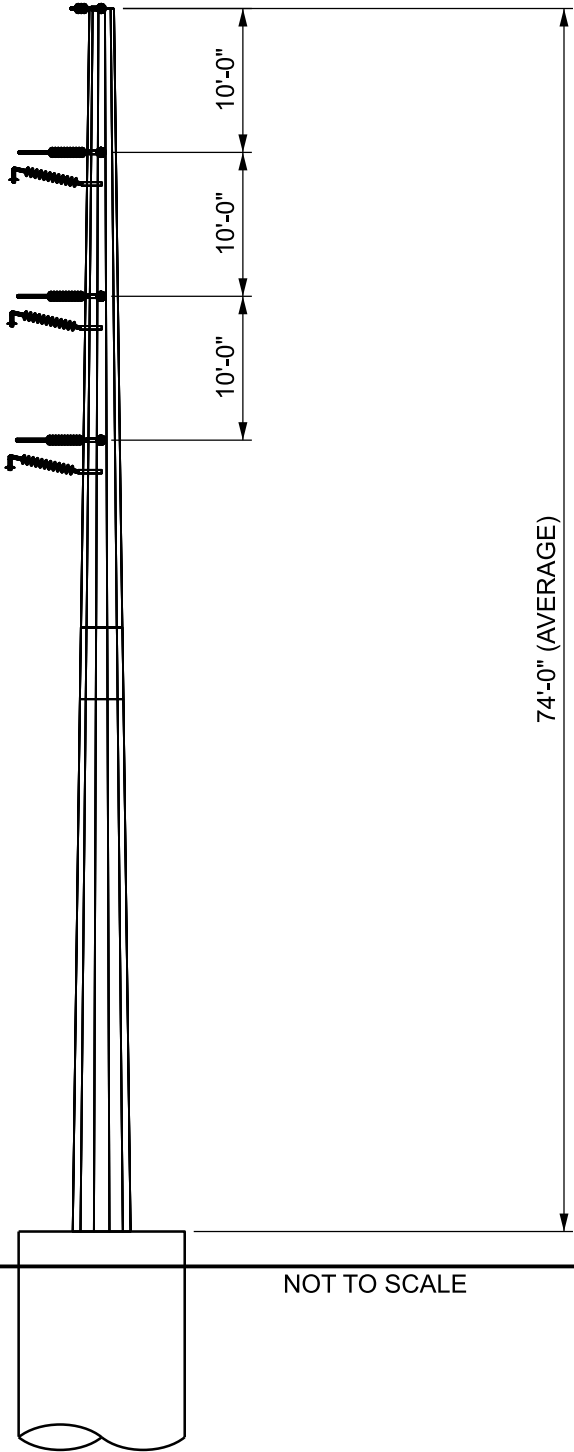


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TYPICAL SCHEMATIC

STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)

(2) SHIELD WIRES



GROUND LEVEL

NOT TO SCALE

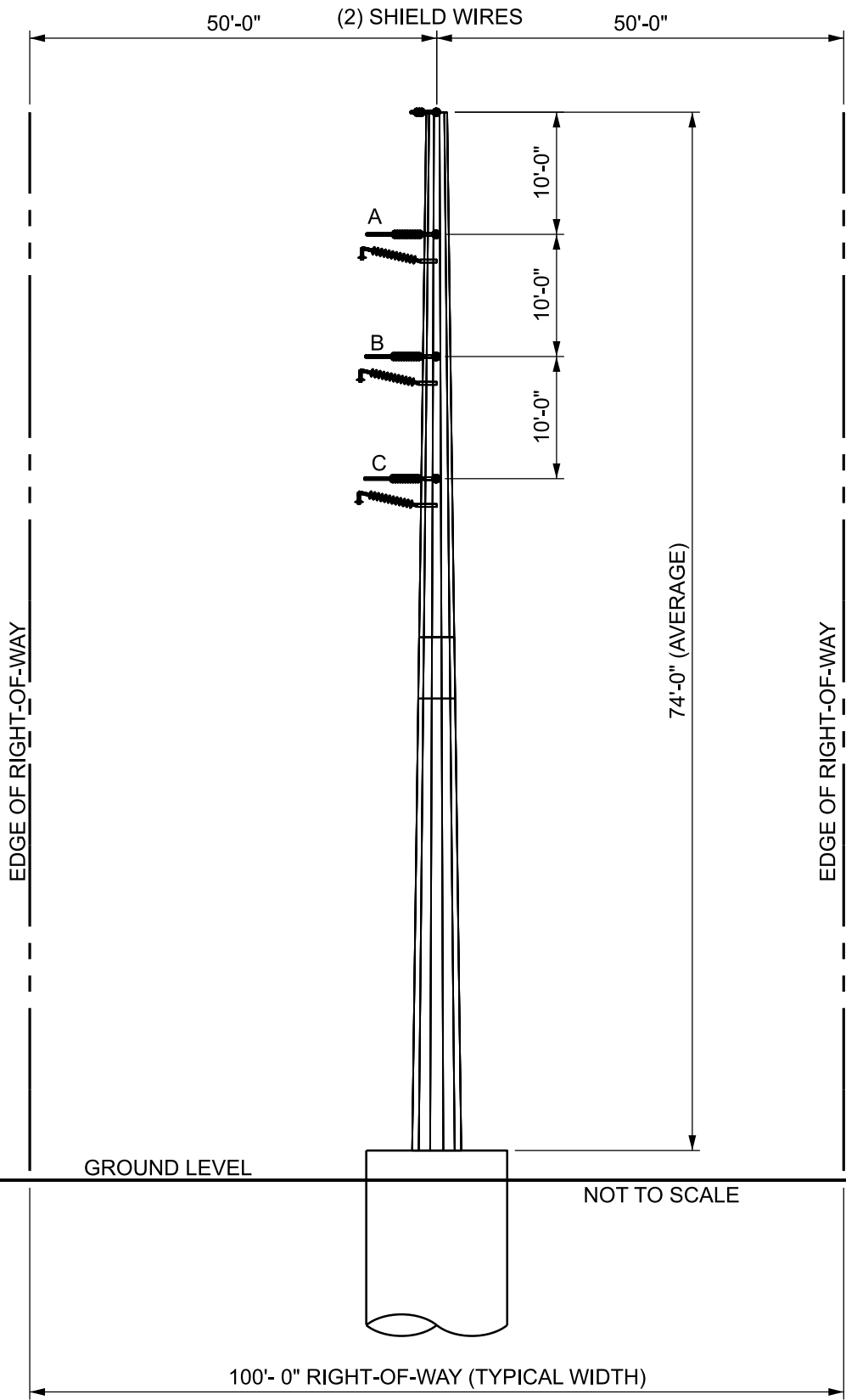
FOUNDATION: DRILLED PIER



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TYPICAL SCHEMATIC

# STEEL MONOPOLE DEAD-END (SINGLE CIRCUIT)



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NOTED ON THIS DATE.

TYPICAL RIGHT-OF-WAY CROSS SECTION

**EXHIBIT 6**

| Identifier from Project Description on Page 1 of Application | Project Section          | One Line Identifier | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | One Line Asset ID                                    | Associated Assets                                                           | Purpose                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Driver for Asset Replacement/Installation                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------|--------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Allen                                                        | Allen Substation Rebuild | (1)                 | Rebuild Allen station on the existing footprint with new 69kV Bay (operated at 46kV). The station will have (4) 46KV line exits each with an associated circuit breaker. The 46kV bus will also have a capacitor bank and (1) 50KVA Station Service transformer. A 20MVA 46/12kV Transformer with a high side circuit switcher will be installed. The 12kv low side bus features (2) distribution line exits with associated circuit breakers, (1) 50KVA Station Service transformer and (1) 3-phase set of voltage regulators. | 69KV Circuit Breakers A009F5, A009G5, A009F8, A009X5 | Three Phase CCVT                                                            | Circuit Breakers provide protection and disconnect means for the feeders. PCE utilizes the Line Potential Transformers to measure voltage changes on the line which informs their protection relays. Surge Arresters limit the voltage that can appear across the transformer terminals, preventing damage from transient over voltages to nearby equipment. Switches provided to provide a means to disconnect breaker from energized bus for maintenance | 46 kV circuit breakers A, B, C, and D are FZO oil type circuit breakers manufactured in the 1960. In general, oil breakers are more difficult to maintain as oil spills have the potential to occur during maintenance, which could create an environmental and safety hazard. Additionally, breakers A, B, C, and D have experienced fault operations exceeding the manufacturer's designed number of fault operations of 10. These breakers will be replaced with A009F5, A009G5, A009F8, and A009X5.                 |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      | 36.5 MCOV Surge Arresters & 69kV Switches                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 69KV HS XFR CS-A009G2                                | 69KV High Side Switch A009J3.                                               | Circuit Switcher A009G2 is used to break the load to the Transformer in the event of a Transformer or low side fault; Switch A009J3 is used to isolate the Transformer from the 46KV Bus for maintenance or for Transformer or low side fault.                                                                                                                                                                                                             | The Transformer currently lacks high side protection from the 12 kV.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 69KV Capacitor Bank Cap 1                            | Circuit Breaker A009G8                                                      | Capacitor banks are installed in substations to provide localized reactive power compensation. This improves the overall power factor, regulates voltage levels, minimizes energy losses in transmission lines and transformers, and increases the active power transfer capacity of the grid. Circuit Switcher Breaker A009G8 is provided to separate Cap Bank CAP1 from the transmission lines and is controlled via PCE Relays.                         | Capacitor switcher AA is a vacuum circuit switcher (VBM) and will be replaced by A009G8. VBM type switchers have experienced issues such as: <ul style="list-style-type: none"><li>Failure to trip due to pole malfunctions</li><li>Worn control yokes and binding solenoid points</li><li>Corrosion, loose bolts, and broken poles,</li><li>Poor cold weather performance</li><li>Older high-voltage VBM designs being particularly troublesome because they use two vacuum interrupters in series per phase</li></ul> |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      | 36.5 MCOV Surge Arresters                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 50KVA Station Service Transformers                   | 36.5 MCOV and 7.65 MCOV Surge Arresters                                     | Provides necessary electrical power to auxiliary systems and equipment. Supports control systems, protection devices, and communication equipment.                                                                                                                                                                                                                                                                                                         | Station service transformers are needed to provide station equipment and systems with electrical power.                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20MVA 46/12kV Transformer TR2                        | 36.5 MCOV and 8.4 MCOV Surge Arresters                                      | Provide voltage transformation from 46kV to 12kV to support distribution customers. Transformer is sized based on customer load in the area with contingency for growth.                                                                                                                                                                                                                                                                                   | 20 MVA 46/12 kV transformer and associated equipment is needed to provide 12 kV service to the existing customers served out of Allen Station.                                                                                                                                                                                                                                                                                                                                                                          |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12kV Voltage Regulators                              | Three 12kV Rated 933kVA Voltage Regulators, Disconnect, 12kV PTs, Arresters | Voltage Regulators provide stable voltage support for the 12kV system in response to load changes and voltage support needs. Switches provided to provide a means to disconnect and bypass the regulator from energized bus for maintenance,                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                              |                          |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12kV Circuit Breakers A009J8, A009K2                 | 12kV Switches, 8.4 MCOV Arresters                                           | Circuit Breakers provide protection and disconnect means for the feeders. Surge Arresters limit the voltage that can appear across the transformer terminals, preventing damage from transient over voltages to nearby equipment. Switches provided to provide a means to disconnect breaker from energized bus for maintenance                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



**EXHIBIT 7**

# Substation Siting Study

## Allen 138 kV Substation Relocation Project

*Prepared for:*



An AEP Company

BOUNDLESS ENERGY™

*Prepared by:*

POWER Engineers, Inc.

11 S. 12<sup>th</sup> Street

Suite 315

Richmond, VA 23219



May 2020

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### Attachments

Attachment A: FEMA Flood Mapping

Attachment B: Slide Risk Study

## **1.0 PROJECT OVERVIEW**

### **1.1 Project Need Summary**

Due to continual flooding events at the existing Allen 138 kV Substation, Kentucky Power Company was tasked with finding viable locations to rebuild the Allen 138 kilovolt (kV) Substation in Floyd County, Kentucky (Project). If the station is relocated, it will be named the Dwale 138 kV Substation, and three existing 46 kV transmission lines and one existing 138 kV transmission line will need to be routed into the new substation.

The existing Allen 138 kV Substation is located within the 500-year floodplain of Beaver Creek in Allen City, Kentucky and has a history of flooding (See below historical flooding images and the FEMA Flood Mapping in **Attachment A**). The flooding has led to significant deterioration of the substation's foundations and structures along with lengthy restoration times post flood events. Approximately 13 feet of fill would be required to raise the existing substation out of the 500-year floodplain and to minimize flooding events. Access to the site is off a narrow road, which crosses a golf course and a railroad without guard structures and limited line of sight. Additionally, the access road crosses a bridge over the Beaver Creek that would need to be studied for capacity and potentially upgraded before it could be used for any construction. The Project will upgrade the site to modern standards, address electrical reliability, and reduce restoration times that have resulted from the deteriorating foundation and structure flooding events by relocating the substation out of the 500-year floodplain or elevating the substation on a platform above the base flood elevation.



**Photos 1 and 2. Flooding of Allen Substation (1984)**

## **1.2 Siting Criteria**

Many of the initial siting considerations for a transmission substation are controlled by the system planning requirements. System planning considerations typically prescribe the general location of the substation and the necessary transmission interconnections needed. Once key system requirements are identified, the engineers and environmental planners identify potential sites and evaluate the potential engineering obstacles, construction logistics, potential operational constraints, and potential environmental and human impacts associated with each site. The following list provides a summary of the siting criteria.

### **System Planning Requirements**

- Electrical Load Center: Identified sites must meet the electrical need and requirements identified by the system planners and do so in an economic and reliable manner.
- Transmission Access: Proximity to the existing McKinney – Allen 46 kV Transmission Line, the Allen – Prestonsburg 46 kV Transmission Line, the Allen – East Prestonsburg 46 kV Transmission Line, and the Betsy Layne – Allen 138 kV Transmission Line that are needed as the electrical sources for the substation.

### **Engineering/Operations**

- Space Requirements: The site must be approximately five acres in order to accommodate the substation and associated stormwater controls for standard substation design.
- Access Requirements: Due to the heavy equipment needed at the site, consideration of bridge/public roadway weight limits is necessary. Access to the site should be via roads with a reasonable grade, length, turning radius, and line of sight. Railroad crossings and joint access to public roads with other private owners should be avoided.
- Geotechnical Considerations: Consideration will be given to soil types and soil stability. Soils with excessive restrictions on engineering and construction factors should be avoided, including areas prone to slips, slides, and large rock outcrops.
- Cost: Relative site development and construction costs are considered in the evaluation.

### **Natural and Human Environment Impacts**

- Terrain/Slope Considerations: Excessively steep terrain should be avoided where feasible. Low-lying sites prone to flooding should be avoided or the site should be elevated above the 100-year floodplain elevation. Allowance should be provided for excavation cuts and fills, drainage and detention ponds, construction disturbed areas, and lay-down areas.

- Historic and Archaeological Concerns: Sites should be reviewed for any impact to historic or archaeological features and these impacts should be minimized.
- Public Use Facilities: Where possible, sites near schools, churches, community buildings, and parks should be avoided.
- Recreational Areas: Recreational areas will be avoided to the maximum extent practical during site selection. Aesthetic impacts should be reviewed and considered to minimize conflicts with these uses.
- Aesthetics: Consideration will be given to the aesthetics of the area. Where appropriate and practical, vegetation screening should be considered to minimize views.
- Residential Land Use: Vacant or undeveloped lands are the preferred location for substation sites, and high-density residential areas should be avoided during preliminary site selection if possible and practical. Whenever possible, the number of individual property owners involved will be minimized.
- Utility Lines: Consideration will be given to the presence of underground gas or water pipelines, drainage easements, other utilities, and proposed adjacent development plans.
- Water Resources/Wetlands: Sites with substantial amounts of wetlands should be avoided if possible. If present, substation design should maximize avoidance and any impacts should be properly mitigated.
- Hazardous Wastes: Alternative Sites should be reviewed for the current or historic presence or use of hazardous materials and avoided where possible.

### **1.3 Study Area**

The Siting Team defined the Project Study Area as being approximately a four-mile radius from the existing Allen Substation. The Eastern Kentucky Electrical Co-op is located within the east and northeast of the Study Area. It is preferred that the new substation is located outside of the co-op service territory to minimize the amount of distribution required to connect to Kentucky Power's system. Sites of adequate size and outside of the floodplain/floodway were considered. Additionally, the ability to route the four transmission lines into the new substation site and to connect to the local distribution system was reviewed.

The Study Area is geographically mountainous where low-lying areas are usually within the floodplain or have existing development along roadways. The mountains are typically forested with large areas of former or active mining land. The Siting Team worked together to find viable locations that minimize the distance from the existing substation and other transmission

infrastructure and overall impacts to the community and environment. Other factors considered in identifying the substation site included the weighing of capital cost versus long term maintenance costs, the location of the Federal Emergency Management Agency 100-year floodplain, access to the site, topography, geotechnical considerations, engineering and operational considerations, landowner negotiations, sufficient acreage, ground contamination issues, and visual and environmental impacts.

## 2.0 ALTERNATIVE SITES

Using established siting guidelines, the Project Team identified suitable sites within the Study Area that would minimize impacts to the natural and human environment and still stay within proximity of the existing 46 kV and 138 kV transmission lines. The Project Team identified a total of 13 Alternative Sites for the proposed Dwale 138 kV Substation, which would replace the existing Allen 138 kV Substation, as shown on **Map 1**.

Several sites were dismissed following desktop review. Alternative Site 3 was dismissed because routing transmission tie-in lines into the site would have been very difficult due to residential development in the towns of Allen and New Allen. Alternative Sites 4, 5, and 6 were dismissed as the sites are too small to accommodate substation design. Additionally, Alternative Site 5 is within the floodplain and has access restrictions, through the golf course and a railroad crossing location, similar to the existing site. Alternative Site 8 was dismissed because the site appears to be fill and used for coal ash storage, which can result in costly foundation design and construction. Alternative Sites 9, 10 and 13 were dismissed because they are located outside of AEP's distribution service territory. Alternative Sites 11 and 12 were dismissed because they would require a significant amount of new transmission line length through residential development, and both were determined to be too far from the distribution load center. Alternative Sites 1, 2, and 7 were retained for further analysis. Detailed aerial maps of retained sites are presented in **Maps 2-4**. Additionally, the feasibility of rebuilding the substation immediately adjacent to the existing site on a platform raised above the base flood elevation was evaluated (**Map 5**).

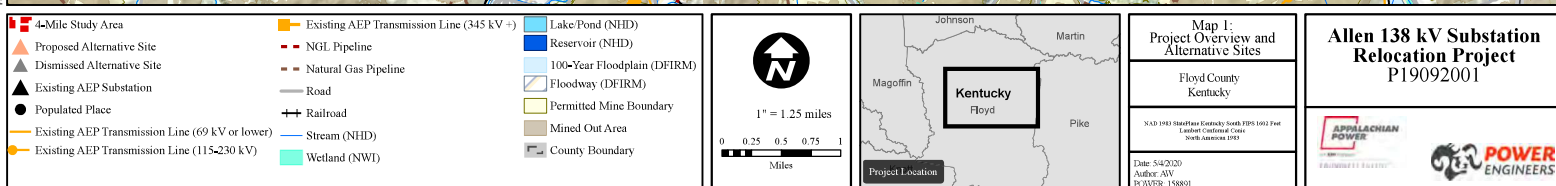
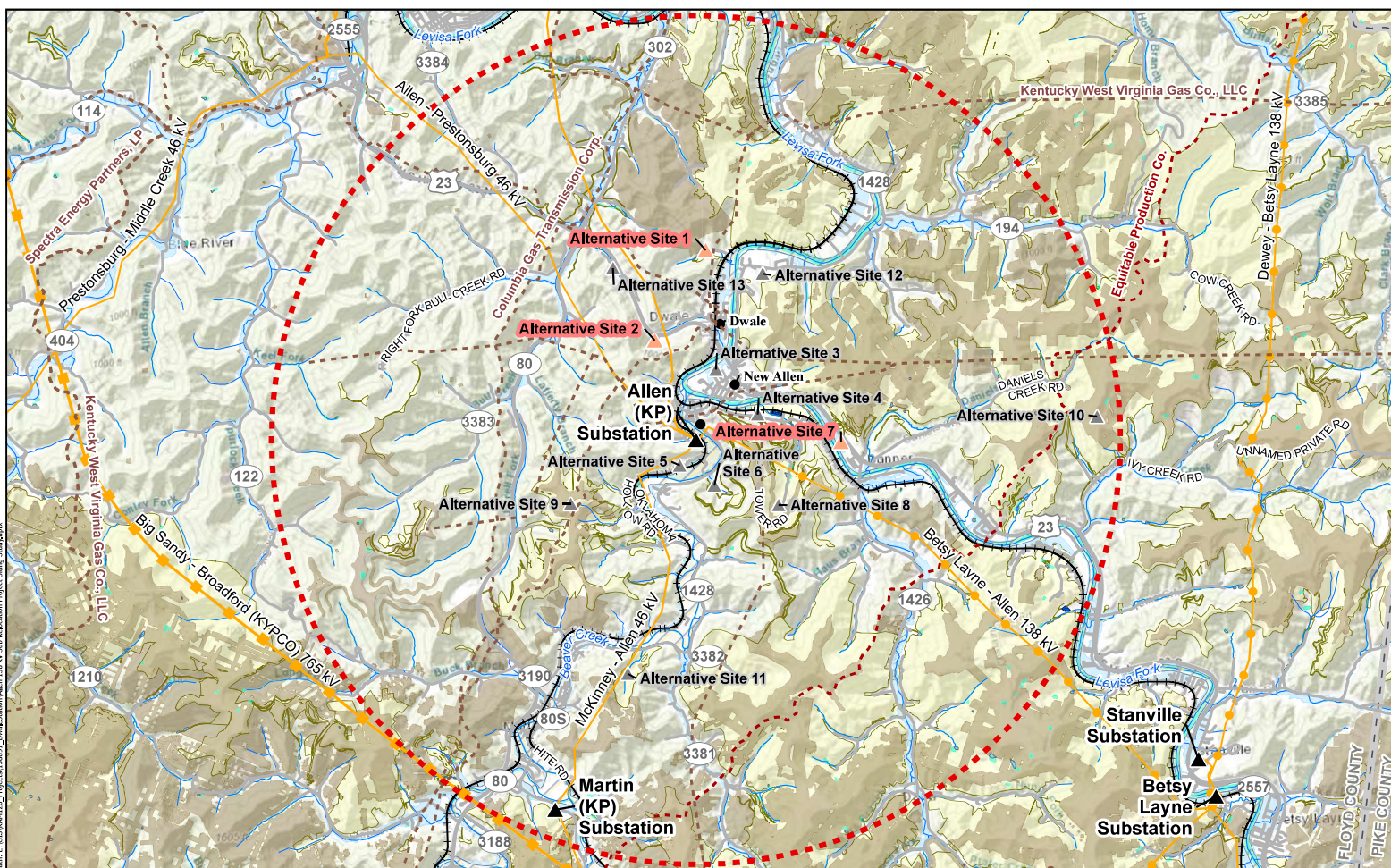




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## Map 1. Alternative Sites



## **2.1 Alternative Site Descriptions**

### **ALTERNATIVE SITE 1: Dismissed**

Alternative Site 1 is located off Railroad Street behind a mobile residential home subdivision approximately 1.8 miles north of the existing Allen Substation. Alternative Site 1 is approximately 0.7 mile east of the Allen – East Prestonsburg 46 kV Transmission Line. Routing the Allen – East Prestonsburg 46 kV Transmission Line to Alternative Site 1 would be relatively simple; however, routing the other three transmission tie-in lines to the site would be difficult due to development south of the site and steep terrain entering the station. Alternative Site 1 is also at the approximate northern boundary for AEP’s distribution service territory and farther from the distribution load located in the towns to the south.

The site is located outside of the 100-year floodplain and is surrounded by steep topography to the north, west, and south. The Levisa Fork and a railway are to the east of the site, and a previously mined area is to the north of the site. There are some drainage concerns from the mined-out area to the site. The site was originally planned for a compressor station and was previously cleared and graded. There is risk of soil contamination due to evidence of dumping on the site.

The site is small and an odd shape which could require a non-standard substation engineering design. Access to the site would be difficult due to a single lane access road through a residential community. The access road to the substation is crossed by a National Wetland Inventory wetland and a stream runs along the south side of the site. Additionally, the site could have high visual impacts to the adjacent residential landowners.

Alternative Site 1 was ultimately dismissed due to the small size, drainage concerns, and access limitations. No photographs of this site are available.



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## Map 2. Alternative Site 1

## ALTERNATIVE SITE 2: Dismissed

Alternative Site 2 is located off United States Highway (US Hwy) 23 approximately 1.0-mile due north of the existing Allen Substation. Alternative Site 2 is crossed by the Allen – East Prestonsburg 46 kV Transmission Line. Routing for the other three transmission tie-in lines is relatively easy and existing ROWs can be used for a portion of their length; however, Alternative Site 2 is located at the bottom of a steep and narrow slope, which presents difficulty for the transmission lines to drop into the substation. As a result, transmission line structures may have to be placed on steep and unstable slopes to enter the station, increasing the risk of slips and slides. The site is in an acceptable location for the distribution load network.

Alternative Site 2 is located outside of the 100-year floodplain but is surrounded by steep topography in all directions. Significant grading is required to cut approximately 10 to 20 feet into the steep side slope which would necessitate a substantial retaining wall. There is an existing ditch on site; however, it would likely be inadequate to sufficiently drain the site in a storm event, and a large amount of stormwater mitigation would be required with the Kentucky Department of Transportation. Additionally, the area above the site is an active landslide risk which could imperil a possible substation and transmission line structures. A study was completed on the extent of risks for slides above the site (**Attachment B**). The study showed that the slide prone area was mostly stable; however, no vegetation should be cleared to maintain stabilization. Vegetation clearing would likely be required for the transmission tie-in line ROW. A gas line is located south of the site which could further limit transmission line structure placement for tie-in lines.

Alternative Site 2 has residential and commercial uses located on it. The residential parcels are currently for sale; however, the commercial property is unwilling to sell which limits the area available for development and requires a non-standard substation engineering design. The site is only accessible from the southbound side of US Hwy 23 and construction access may be further limited due to the sharp turning radius at the site driveway.

Alternative Site 2 was dismissed due to development concerns, slide risks, and access restrictions.





**Photo 3. North of Alternative Site 2 Facing South**

### **Map 3. Alternative Site 2**





### **ALTERNATIVE SITE 7: Dismissed**

Alternative Site 7 is located off US Hwy 23 approximately 1.4 miles east of the existing Allen Substation. Alternative Site 7 is approximately 0.5-mile northeast of the Betsy Layne – Allen 138 kV Transmission Line. The other transmission lines could likely parallel the Betsy Layne – Allen 138 kV Transmission Line into the site. Routing transmission tie-in lines to this site would be feasible and the site is in an acceptable location for the distribution network.

Alternative Site 7 is not located within a 100-year floodplain; however, it is surrounded by floodplain. It is likely that the site was raised out of the floodplain using fill which could impact the substation foundation design. The site is of an adequate size for site design and is currently a commercial space that sells sheds and other gardening supplies. Kentucky Power attempted to contact the landowner but was unable to make contact. It is possible they would not have been willing to sell, or the price would have been very high given their active business. Alternative Site 7 has easy access directly off US Hwy 23, which would not need to be upgraded for construction.

Alternative Site 7 was dismissed due to the inability to contact the landowner (unknown sale price) and possible geotechnical considerations with the existing fill.



**Photo 4: Alternative Site 7 Southeast of Site Facing Northwest**

## **Map 4. Alternative Site 7**



## **EXISTING ALLEN SUBSTATION SITE: Recommended**

As no alternative sites were ideal and building the new substation immediately adjacent to the existing Allen Substation site was evaluated for feasibility. A new station adjacent to the existing site requires very limited transmission line work and it is already in an ideal location for the distribution network. Additional property will be required to rebuild the substation. Additional parcels north of the substation will need to be purchased and one residence will need to be relocated. A cost comparison white paper was completed comparing costs of relocating the substation to Alternative Site 2 versus building the new substation immediately adjacent to the existing substation as either a gas-insulated or air-insulated substation (**Attachment C**). Building an air-insulated substation immediately adjacent to the existing site was the most cost-effective option.

The new site will be an air-insulated substation situated on platforms approximately 7 to 10 feet high and above the base flood elevation of the site. Due to outage constraints at the existing substation, temporary lines and a mobile will keep the existing substation in-service during construction. Once construction is complete the existing substation site will be retired, equipment removed, and the land will be used as an additional drive path to the substation and for parking.

Access to the site is still constrained. The bridge crossing of Beaver Creek will need to be evaluated to better understand its limitations and whether it can be used for construction without upgrades. Flaggers will need to be used at the railroad during construction.

## **Map 5. Existing Allen Substation Site**





### **3.0 SUMMARY AND RECOMMENDATIONS**

The recommended site is the one most likely to allow for the routing of the four existing transmission lines, will work for the local distribution network, will be the most cost-effective, and is likely to facilitate the certification and permitting process.

The Project Team recommends rebuilding the Allen Substation immediately adjacent to the existing Allen Substation site rather than building the new Dwale Substation on an alternative site. Rebuilding the Allen Substation immediately adjacent to the existing site is the most cost-effective option and would require minimal work to tie into the existing transmission and distribution network. The rebuilt substation will be air-insulated and elevated on a platform approximately 7 to 10 feet above the base flood elevation. Evaluation of the bridge to access the site will be needed prior to construction.

Alternative Sites 1, 2, and 7, while constructible, are not recommended as the proposed site. Alternative Site 1 would require non-standard substation design due to small parcel size and odd parcel shape, have drainage concerns from the mined area immediately north of the site, and have limited access. Alternative Site 2 would require non-standard substation design due to small parcel size, be limited in transmission tie-in line structure placement due to steep topography and a gas line, have an active slide risk above the site, and have access restrictions. Alternative Site 7 did not appear to be available for purchase and has potential geotechnical considerations due to assumed fill on site.

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## **Attachment A. FEMA Flood Mapping**

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February 20, 2020

Project 2019-278

Mr. Matthew H. Blankenship  
American Electric Power  
40 Franklin Road SW  
Roanoke, VA 24011

***Qualitative Flood Hazard Assessment at Allen Substation  
Allen, Floyd County, KY***

Dear Mr. Blankenship:

DiGioia Gray & Associates (DiGioia Gray) is pleased to submit this report on our qualitative flood hazard assessment at American Electric Power's (AEP's) Allen Substation located in Allen, Floyd County, Kentucky. Our assessment and report have been prepared in general conformance with our proposal dated December 19, 2019, which was subsequently approved by AEP by issuance of Work Order 80104586 under Contract 03034017, dated 1/16/20.

**Background**

The Allen Station is located along Beaver Creek and is depicted to be outside of the Federal Emergency Management Agency (FEMA) 100-year floodplain but within the 500-year floodplain limits (see **Figure 1**). The confluence of Beaver Creek with the Levisa Fork in the City of Allen is approximately 2700 feet downstream from the station.

We understand that AEP is considering options that would allow a rebuild of the Allen Substation at its current location, but with mitigation efforts to reduce the risks and costs of flooding events overall. AEP plans to accomplish this by building up the site with engineered fill if the change to the final grade elevation is less than +4 feet or utilizing a system like a Kenner Chain Wall if the change is greater than +4 feet.

**Historic Flooding at the Station**

With reference to **Figure 2** (supplied by AEP), specific events have been documented for 1957, 1977 and 1984. You had supplied additional information via e-mail on December 18, 2019. This information was:

*"It looks like you'll have to rely on readily available data. I reached out to our TFS management and the station servicer. It doesn't appear there are any records kept on water levels in the station. The servicer has been there for 5 years and has never saw water in the station. I also spoke with our transformer servicer who has been there since 1985. He stated there has been a couple times since then where there has been an inch or so of water in localized areas of the station but nothing impeding access. This is all the information I was able to dig up."*



### **Review of FEMA Information**

Floyd County has been studied extensively by FEMA. Key items obtained from the FEMA Flood Map Service Center are presented and discussed below.

The effective Flood Insurance Study (FIS) for Floyd County is dated September 16, 2015 and is therefore relatively recent. See **Attachment A1**.

Historic flooding events for Floyd County, and specifically Levisa Fork are listed in the FIS. See **Attachment A2**. These historic events are dated 1/30/1957 and 04/06/1977. These events are consistent with the high water/extreme event observations at Allen station as shown on **Figure 2**.

The hydrologic and hydraulic analyses methodologies for Beaver Creek and Levisa Fork are summarized on **Attachment A3**. The hydrologic study for Beaver Creek utilized U.S. Army Corps of Engineers values and the hydrology study for Levisa Fork used statistical analyses of actual stream gage data to determine the flow rates for specific return period events (e.g. 10-year, 50-year, 100-year, etc.) for subsequent use in the hydraulic analyses. The hydraulic analyses for both streams were completed using HEC-RAS, the current standard for performing such analyses. The modeling for Beaver Creek was completed in 2004 and the modeling for Levisa Fork was completed in 2013.

Flood profiles for Beaver Creek are shown on **Attachment B**. The approximate location of the Allen station is depicted. The 100-year flood level is approximately 644.9 and the 500-year water surface elevation is on the order of 650.3. The profiles clearly indicate a substantial backwater influence from Levisa Creek for both the 100-year and the 500-year events; however, an additional influence on flood levels from Beaver Creek for the 500-year event begins just downstream of the Allen station. The inundation limits for the 100-year and 500-year events are shown on **Figure 1**.

### **Discussion**

Equipment at the Allen station is currently elevated somewhat above the existing ground surface as shown on **Figure 2**. It is estimated that the critical equipment currently sits approximately 2.5 to 3 feet above the ground surface, and the ground surface elevation immediately around the equipment at the station appears to be approximately 640 feet (utilizing Google Earth imagery). This would indicate that the inundation should be around 5 feet for the 100-year event (100-year flood level is 644.9). However, our suspicion is that during the hydraulic modeling, the modeler considered the nearby railroad tracks and surrounding ground to 'act like a levee' and keep flood waters from reaching the station. This assumption would **not** be valid if there were drainage culverts beneath the railroad tracks in the vicinity.

The 500-year event is estimated to inundate the station with approximately 10 feet of water.

### **Suggestions/Considerations**

The AEP records indicate that the station has been flooded by three (3) major events since 1957 (1957, 1977, and 1984). There has been no flooding significant enough since the 1984 event to inundate the station or hinder access to the station. Notwithstanding, however, the station is in the floodplain and there is a risk of flooding.

Considering this desktop study, DiGioia Gray suggests that AEP consider raising the station (or the critical equipment) a minimum of seven (7) feet above the ground surface, to elevation 647. This would allow for 2 feet of freeboard above the 100-year flood level to account for uncertainties and assumptions in the hydrologic and hydraulic studies. By estimate from **Figure 2**, this would most likely protect the station from a repeat of the 1984 flood, but not the 1977 and 1957 events. Raising the station above

elevation 650.3 would protect the station against the 500-year event, likely similar in magnitude to the 1977 and 1957 events. This would, no doubt, have a commensurate effect on cost.

We also suggest that any estimates of elevations in this report be confirmed by field survey, and appropriate adjustments made, should the station-raising concept move forward.

### **Closing**

Our work was performed in a manner consistent with the level of care which is typical of other members of our profession practicing in the same conditions, location, and date our services are provided. This report was prepared specifically for AEP and its designated representatives.

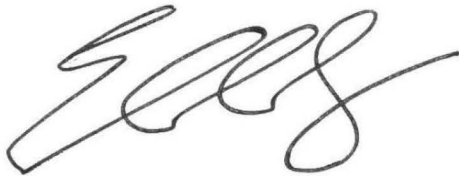
We appreciate the opportunity to perform this flood assessment and to provide you with this letter report. Erich and I will reach out to you on February 24<sup>th</sup> to answer any questions that you may have. However, if you have any in the meantime, please call me at (724) 771-0012 or Erich at (412) 860-5297.

Sincerely,

DiGioia Gray & Associates



Timothy N. Kyper, PE  
Principal Consultant



Erich V. Zorn, PhD, PG  
Project Manager / Senior Geologist  
Geosciences & Civil Engineering

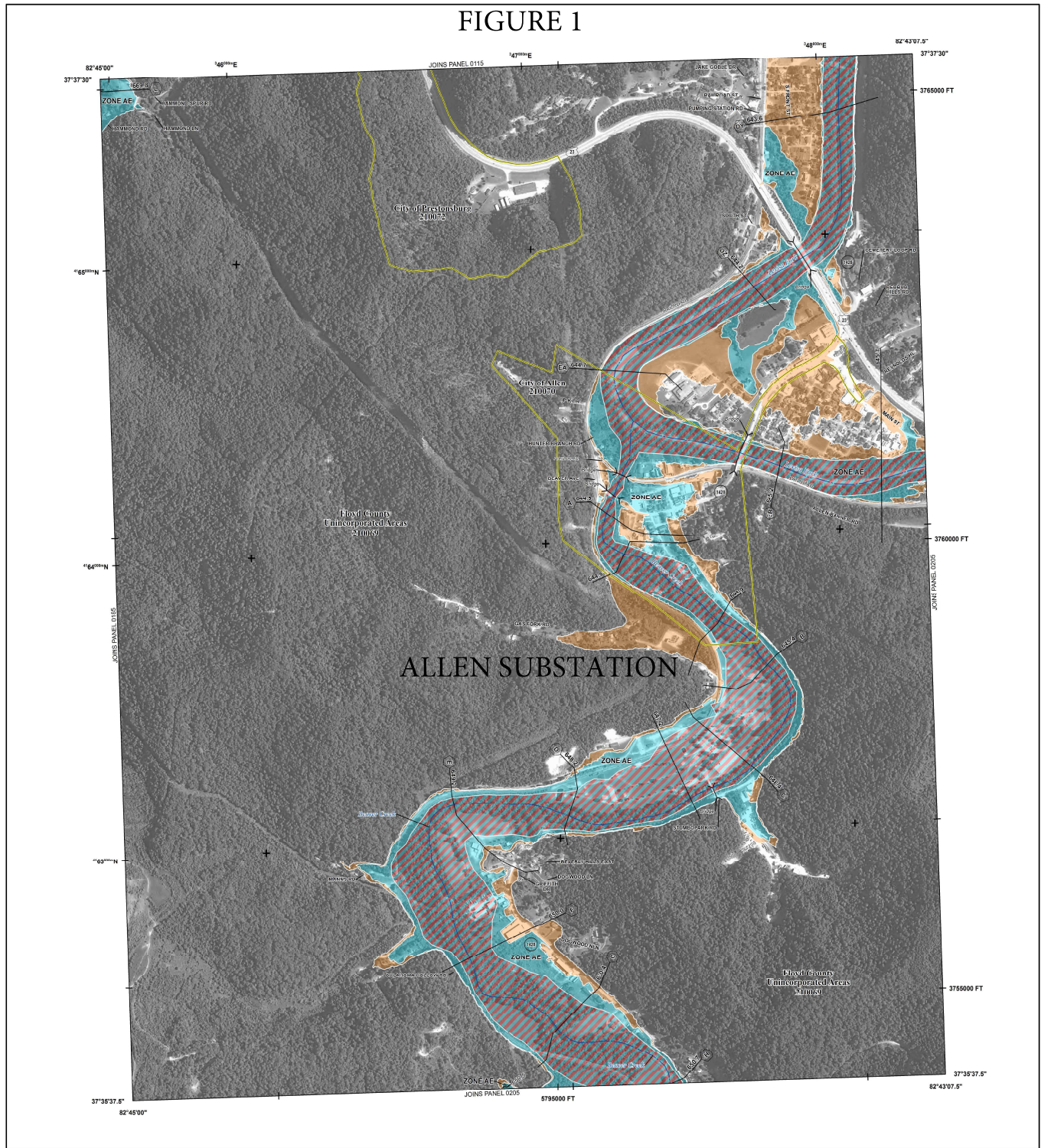
### **Enclosures:**

- Figure 1 – FEMA Flood Insurance Rate Map and Site Location
- Figure 2 – Annotated Photograph of Breakers with Historic Flood Levels at Allen Substation
- Attachment A (A1, A2, A3) – Flood Insurance Study – Floyd County, Kentucky
- Attachment B – Beaver Creek Flood Profiles with Site Location

## **FIGURE 1**



# FIGURE 1



## FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT  
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING  
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT  
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

| SPECIAL FLOOD HAZARD AREAS  | Without Base Flood Elevation (BFE)<br>Zone A, V, AH, AI<br>With BFE or Depth Zone AE, AO, AH, VE, AI, R                                                           | Regulatory Floodway |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|                             |                                                                                                                                                                   |                     |
| OTHER AREAS OF FLOOD HAZARD | 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 Zone X |                     |
|                             | Future Conditions 1% Annual Chance Flood Hazard Zone X                                                                                                            |                     |
| OTHER AREAS                 | Area with Reduced Flood Risk due to Levee See Notes Zone X                                                                                                        |                     |
|                             | Areas of Minimal Flood Hazard Zone X                                                                                                                              |                     |
| GENERAL STRUCTURES          | Area of Undetermined Flood Hazard Zone D                                                                                                                          |                     |
|                             | Channel, Culvert or Storm Sewer                                                                                                                                   |                     |
| OTHER FEATURES              | Accredited or Provisionally Accredited Levee, Dike or Floodwall                                                                                                   |                     |
|                             | Non-accredited Levee, Dike or Floodwall                                                                                                                           |                     |
|                             | Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)                                                                                                |                     |
|                             | Coastal Tract                                                                                                                                                     |                     |
|                             | Coastal Tract Baseline                                                                                                                                            |                     |
|                             | Hydrographic Feature                                                                                                                                              |                     |
|                             | Base Flood Elevation Line (BFE)                                                                                                                                   |                     |
|                             | Limit of Study                                                                                                                                                    |                     |
|                             | Jurisdiction Boundary                                                                                                                                             |                     |

## NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of the FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information exchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or downloaded directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information exchange.

Communities entering and on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.

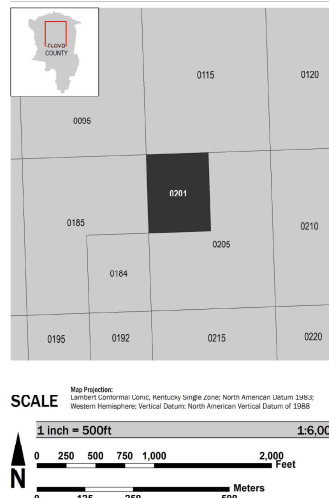
For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-438-6020.

Base map information shown on this FIRM was provided in digital format by the State of Kentucky Division of Geographic Information (KY DGI). Ortho imagery was originally produced by the National Agriculture Imagery Program (NAIP) in 2010 and has a 1-meter ground resolution.

In cooperation with the Federal Emergency Management Agency (FEMA) and local communities in Kentucky, the Flood Insurance Rate Map was developed by the Kentucky Division of Water in a digital statewide format to assist communities in their efforts to minimize the loss of property and life through effectively managing development in flood-prone areas. The State of Kentucky has implemented a long-term approach to floodplain management to reduce the impacts of flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As part of this effort, the Kentucky Division of Water is working closely with FEMA as a Cooperating Technical Partner to produce and maintain this digital FIRM.

## PANEL LOCATOR



### National Flood Insurance Program

#### NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP

**FLOYD COUNTY, KENTUCKY**  
and Incorporated Areas  
Panel 201 = 395

Panel Contains:

| COMMUNITY             | NUMBER | PANEL | SUFFIX |
|-----------------------|--------|-------|--------|
| ALLEN CITY OF         | 210070 | 0201  | E      |
| FLOYD COUNTY          | 210089 | 0201  | E      |
| PRESTONSBURG, CITY OF | 210072 | 0201  | E      |

VERSION NUMBER  
2.3.3.2

MAP NUMBER  
2107100201C

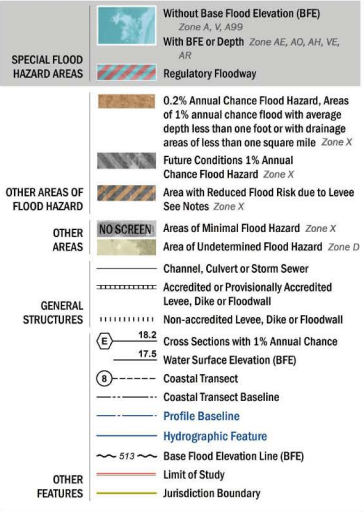
EFFECTIVE DATE  
SEPTEMBER 16, 2015

State of Kentucky  
Federal Emergency Management Agency



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT  
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING  
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT  
HTTP://MSC.FEMA.GOV



NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of the FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-8620.

Base map information shown on this FIRM was provided in digital format by the State of Kentucky Division of Geographic Information (KY DGI). Ortho imagery was originally produced by the National Agriculture Imagery Program (NAIP) in 2010 and has a 1-meter ground resolution.

In cooperation with the Federal Emergency Management Agency (FEMA) and local communities in Kentucky, this Flood Insurance Rate Map was developed by the Kentucky Division of Water in a digital statewide format to assist communities in their efforts to minimize the loss of property and life through effectively managing development in flood-prone areas. The State of Kentucky has implemented a long term approach to floodplain management to reduce the impacts of flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As part of this effort, the Kentucky Division of Water is working closely with FEMA as a Cooperating Technical Partner to produce and maintain this digital FIRM.

PANEL LOCATOR

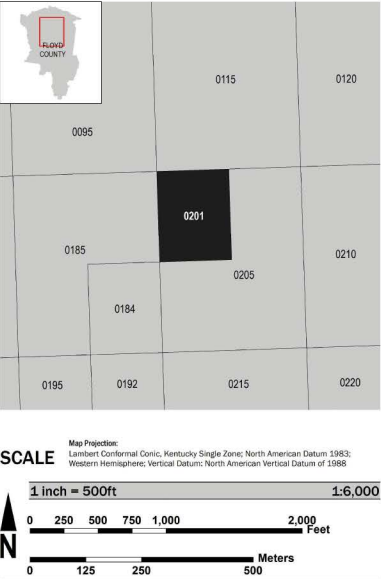


FIGURE 1 - LEGEND

NATIONAL FLOOD INSURANCE PROGRAM  
FLOOD INSURANCE RATE MAP

FLOYD COUNTY,  
KENTUCKY  
and Incorporated Areas  
Panel 201 of 395

| COMMUNITY            | NUMBER | PANEL | SUFFIX |
|----------------------|--------|-------|--------|
| ALLEN, CITY OF       | 210070 | 0201  | E      |
| FLOYD COUNTY         | 210069 | 0201  | E      |
| PRESTONBURG, CITY OF | 210072 | 0201  | E      |

VERSION NUMBER  
2.3.3.2

MAP NUMBER  
21071C0201E

EFFECTIVE DATE  
SEPTEMBER 16, 2015

State of Kentucky  
Federal Emergency Management Agency



# FIGURE 1 - MAP DETAIL

The map provides a detailed view of the Allen Substation and its immediate surroundings. The substation's boundary is clearly defined by a yellow line, enclosing several 'ZONE AE' areas. These zones are situated along the Levisa Fork and Beaver Creeks. The map includes labels for various infrastructure elements: roads (Hunter Branch Rd, Beaver Ave, Gas Fork Rd, Allen Banner Rd, Main St, Reynolds Hill), bridges, and railroad lines. The surrounding land is divided into the City of Allen (210070) and Floyd County Unincorporated Areas (210069). Specific points of interest are marked with labels such as EA 644.7, A 644.9, EB 645.2, D 646.2, and C 646.4. A north arrow is positioned in the upper right corner of the map.

## **FIGURE 2**

## Flood Water on Breakers



## **ATTACHMENT A1**



# FLOOD INSURANCE STUDY

## FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 3



### FLOYD COUNTY, KENTUCKY AND INCORPORATED AREAS

| COMMUNITY NAME                       | COMMUNITY NUMBER |
|--------------------------------------|------------------|
| CITY OF ALLEN                        | 210070           |
| FLOYD COUNTY<br>UNINCORPORATED AREAS | 210069           |
| CITY OF MARTIN                       | 210071           |
| CITY OF PRESTONSBURG                 | 210072           |
| CITY OF WAYLAND                      | 210073           |
| CITY OF WHEELWRIGHT                  | 210074           |



# FEMA

**EFFECTIVE:**

**September 16, 2015**

FLOOD INSURANCE STUDY NUMBER  
**21071CV001A**

Version Number 2.3.3.2

## **ATTACHMENT A2**



## Attachment A2

**Table 7: Historic Flooding Elevations**

| Flooding Source | Location                    | Historic Peak (Feet NAVD88) | Event Date    | Approximate Recurrence Interval (years) | Source of Data |
|-----------------|-----------------------------|-----------------------------|---------------|-----------------------------------------|----------------|
| Levisa Fork     | N/A                         | 49.4                        | February 1862 | N/A                                     | USGS           |
| Levisa Fork     | Prestonsburg Gaging Station | 48.78                       | 01/30/1957    | N/A                                     | USGS           |
| Levisa Fork     | N/A                         | 45.71                       | 04/06/1977    | N/A                                     | N/A            |

**4.3 Non-Levee Flood Protection Measures**

Table 8 contains information about non-levee flood protection measures within Floyd County such as dams, jetties, and or dikes. Levees are addressed in Section 4.4 of this FIS Report.

**Table 8: Non-Levee Flood Protection Measures**

| Flooding Source | Structure Name   | Type of Measure   | Location                                                                                                                                                                            | Description of Measure                                   |
|-----------------|------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Levisa Fork     | N/A              | N/A               | Fishtrap Lake, located on Levisa Fork in Pike County, Kentucky, 103.3 miles above its mouth                                                                                         | Regulated since October 1968, project constructed by COE |
| Levisa Fork     | Jim W. Flannagan | Dam and Reservoir | Located on Pound River, a tributary of Russell Fork of Levisa Fork in Dickenson County, Virginia, 123.2 miles above the mouth of Levisa Fork                                        | Regulated since March 1965, project constructed by COE   |
| Levisa Fork     | N/A              | N/A               | North Fork of Pound Lake, located on the North Fork of Pound River, a tributary of Russell Fork of Levisa Fork in Wise County, Virginia, 157.2 miles above the mouth of Levisa Fork | Regulated since August 1966, project constructed by COE  |

## **ATTACHMENT A3**

## Attachment A3, 1 of 2

Table 13: Summary of Hydrologic and Hydraulic Analyses

| Flooding Source | Downstream Limit                                  | Upstream Limit                                                   | Hydrologic Model or Method Used       | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|-----------------|---------------------------------------------------|------------------------------------------------------------------|---------------------------------------|--------------------------------|-------------------------|--------------------|------------------------|
| Abbott Creek    | Confluence with Levisa Fork                       | Approximately 230 feet downstream of confluence of Bee Fork      | HEC-1, Regional Frequency Computation | HEC-2                          | 07/01/1981              | AE                 |                        |
| Abbott Creek    | Confluence of Bee Fork                            | 3,696 feet upstream of confluence of Bee Fork                    | Regression Equations                  | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Abner Fork      | Confluence with Left Fork Beaver Creek            | 8,169 feet upstream of confluence with Left Fork Beaver Creek    | Regression Equations                  | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Alum Lick Fork  | Confluence with Caney Creek                       | 6,731 feet upstream of confluence with Caney Creek               | Regression Equations                  | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Arkansas Creek  | Confluence with Beaver Creek                      | Approximately 750 feet upstream of Cane Fork Road                | USACE Values                          | HEC-RAS 4.1.0                  | 05/13/2004              | AE                 |                        |
| Arkansas Creek  | Approximately 750 feet upstream of Cane Fork Road | 7,022 feet upstream of Cane Fork Road                            | Regression Equations                  | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Bear Hollow     | Confluence with Little Paint Creek                | 8,394 feet upstream of confluence with Little Paint Creek        | USACE Values                          | HEC-RAS 4.1.0                  | 05/13/2004              | AE                 |                        |
| Beaver Creek    | Confluence with Levisa Fork                       | Confluence of Left Fork Beaver Creek and Right Fork Beaver Creek | USACE Values                          | HEC-RAS 4.1.0                  | 05/13/2004              | AE                 |                        |
| Bee Fork        | Confluence with Abbott Creek                      | 4,764 feet upstream of confluence with Abbott Creek              | Regression Equations                  | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |

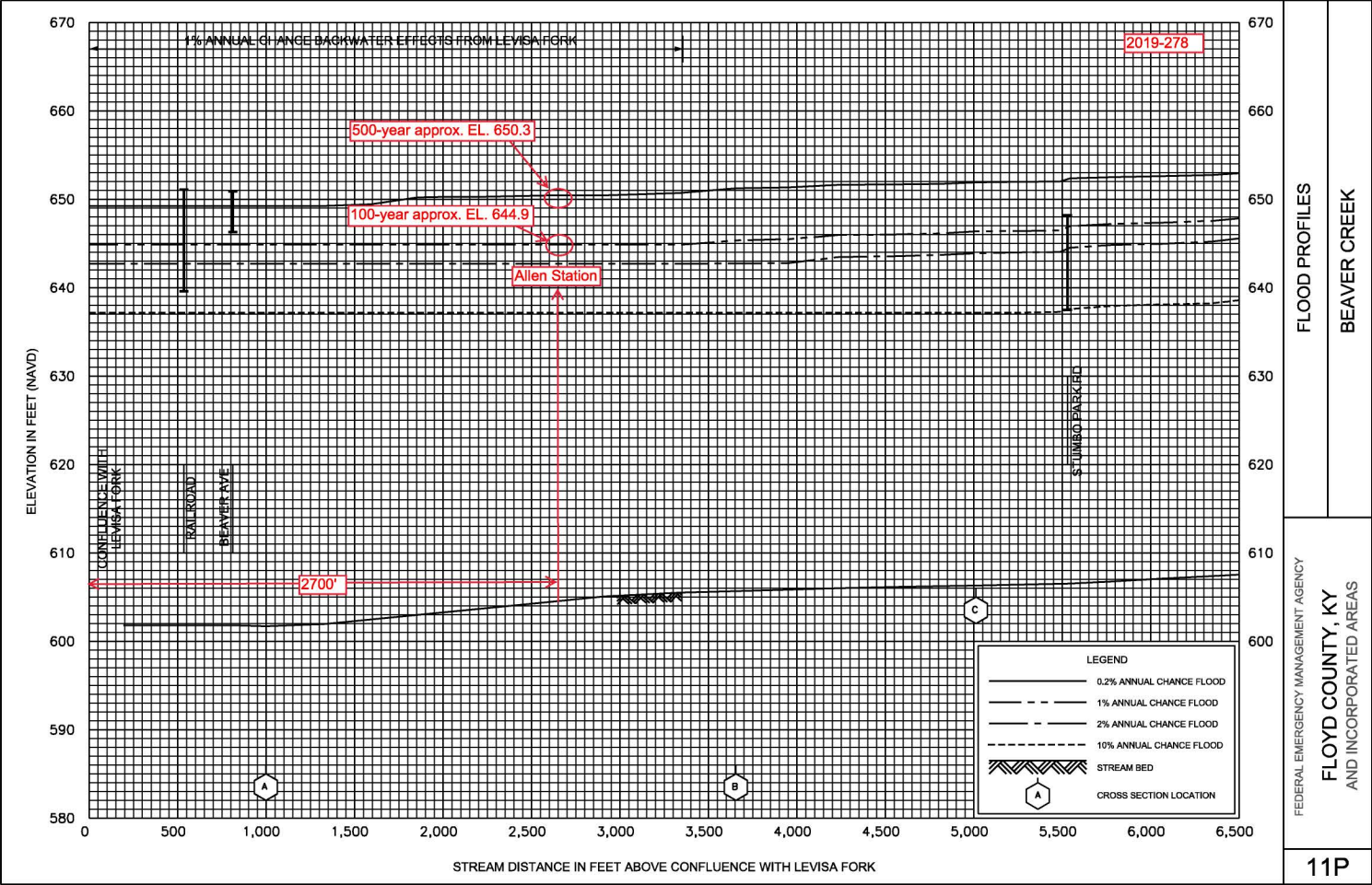
## Attachment A3, 2 of 2

Table 13: Summary of Hydrologic and Hydraulic Analyses continued

| Flooding Source                    | Downstream Limit                                                     | Upstream Limit                                                                                             | Hydrologic Model or Method Used | Hydraulic Model or Method Used | Date Analyses Completed | Flood Zone on FIRM | Special Considerations |
|------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------|-------------------------|--------------------|------------------------|
| Left Fork Ivy Creek                | Confluence with Ivy Creek                                            | 2,430 feet upstream of confluence with Ivy Creek                                                           | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Left Fork Little Paint Creek       | Confluence with Little Paint Creek and Right Fork Little Paint Creek | 6,179 feet upstream of confluence with Little Paint Creek and Right Fork Little Paint Creek                | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Left Fork Middle Creek Levisa Fork | Confluence with Middle Creek Levisa Fork                             | 1,017 feet upstream of confluence of Caney Creek                                                           | USACE Values                    | HEC-RAS 4.1.0                  | 05/13/2004              | AE                 |                        |
| Left Fork Middle Creek Levisa Fork | 1,017 feet upstream of confluence of Caney Creek                     | 3,696 feet upstream of confluence of Pitts Fork                                                            | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Left Fork Otter Creek              | Confluence with Right Fork Otter Creek and Otter Creek               | 3,368 feet upstream of confluence with Right Fork Otter Creek and Otter Creek                              | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Left Fork Toler Creek              | Confluence with Toler Creek                                          | Approximately 490 feet upstream of the intersection of Left Fork Toler Branch Road and Elvie Salsbury Road | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |
| Levisa Fork                        | Johnson County boundary                                              | Pike County boundary                                                                                       | Gage Analysis                   | HEC-RAS 4.1.0                  | 10/07/2013              | AE                 |                        |
| Levisa Fork Tributary 1            | Confluence with Levisa Fork                                          | 5,114 feet upstream of confluence with Levisa Fork                                                         | Regression Equations            | HEC-RAS 4.1.0                  | 10/07/2013              | A                  |                        |

## **ATTACHMENT B**

ATTACHMENT B





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## **Attachment B. Slide Risk Study**

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July 25, 2019

Project 2019-227

Mr. Frederick Collard  
Transmission Line Engineering  
American Electric Power  
40 Franklin Road SW  
Roanoke, VA 24011

***Proposal for Field Reconnaissance and Evaluation of Geologic Hazards at the Proposed Dwale Substation Site, AEP Allen Station Rebuild/Relocation Project, Floyd County, Kentucky***

Dear Mr. Collard:

DiGioia Gray & Associates (DiGioia Gray) is pleased to submit this proposal for geologic hazard-focused field reconnaissance and evaluation services for the proposed Dwale Substation on the American Electric Power (AEP) Allen Station Rebuild/Relocation Project in Floyd County, Kentucky.

The scope of work and fee provided herein are based on the information provided by AEP via e-mail, discussions with AEP, and our experience with similar projects. This proposal presents our project understanding followed by scope of services, deliverables, schedule, cost proposal, assumptions and exclusions, limitations and a closing statement.

## **PROJECT UNDERSTANDING**

AEP recently proposed to construct the Dwale Substation in Floyd County, Kentucky. We understand that the proposed Dwale Substation is approximately 1.85 acres, located at 37° 37' 17.0" N, 82° 44' 07.2" W, near Dwale, Kentucky (see attached figure provided by AEP). Our understanding is that the preliminary concept includes constructing towers along the following four new transmission-line right-of-ways (ROW) from the proposed Dwale Substation. See attached preliminary concept plan provided by AEP, entitled "Allen Station Relocation, TL Conceptual Plan into Proposed Dwale Station".

1. Dwale to Prestonsburg #2 69kV
2. McKinney – Dwale 69kV
3. Dwale – Stanville 69kV
4. Dwale – Prestonsburg #1 69kV

On July 11, 2019, AEP requested that DiGioia Gray conduct field reconnaissance focused on geologic hazards and slope stability, prepare a letter report summarizing observations and recommendations, and if necessary, present conceptual mitigation options for two areas of interest surrounding the proposed Dwale Substation. The scope of services described herein are necessary to complete this effort.

The study area consist of two area of interests: the south area is approximately 54 acres encompassing the proposed Dwale Station, existing Tower K342-6, and three of the proposed ROWs (routes 1 – 3 listed above); and the north area is approximately 36 acres encompassing existing Towers K342-7 and K342-8 and the proposed Dwale – Prestonsburg #1 69kV ROW route. The main concern in the south area is around the proposed station, with focus on the proposed ROW routes and towers as well as the surrounding area. The main concern in the north area are conditions along the proposed ROW route and tower locations that may have potential impact to the highway below.

According to the Kentucky Geological Survey (KGS), two verified landslides are located in the study area. Additionally, several mapped historic landslides and areas susceptible to debris flows are located within the study area and the surrounding area, including near existing Tower K345-9 of the Allen-Prestonsburg #2 Transmission-Line.

The scope of services described within this proposal should be considered the first phase (“Phase 1”) of a potentially multi-phased project. If deemed necessary, future phases may include subsurface investigation, development of a long-term engineering solution and mitigation efforts, the scope and schedule for which will be determined collaboratively between DiGioia Gray and AEP based on the outcome of “Phase 1”.

### **SCOPE OF SERVICES**

DiGioia Gray will include the following services as part of this scope, organized into the following tasks:

#### **Task 1 – Kick-Off Meeting**

Initial conference call to discuss scope, confirm expectations for slope stability and site drainage evaluation, and schedule site visit.

#### **Task 2 – Field Reconnaissance**

DiGioia Gray will complete the following scope of services as part of Task 2:

- Develop a Health and Safety Plan (HASP) for field activities.
- Perform a limited geologic desktop study to better understand the surface and subsurface conditions, including mapped coal mining and landslides.
- Perform a site reconnaissance to field-verify and document landslide features and contributing factors, potentially geologically hazardous areas and their extents, and identify suitable remediation and mitigation options for existing or potentially unstable features within the study area.
  - Includes 2 days onsite, plus travel time and applicable expenses for two (2) DiGioia Gray personnel. For safety and logistical purposes, this reconnaissance activity requires two personnel.

#### **Task 3 – Letter Report**

DiGioia Gray will complete the following scope of services as part of Task 3:

- Develop one (1) letter report that will include the following information:
  - Description of site observations
  - Evaluation of slope stability and site drainage
  - Discussion of risk on future infrastructure
  - Discussion of Geology
  - Coal mining evaluation
  - If deemed necessary, up to three (3) non-engineered conceptual mitigation options and provide opinion of probable construction costs for all conceptual mitigation options

#### **Task 4 – Follow-Up Meeting**

Participate in one (1) teleconference between AEP and two (2) DiGioia Gray personnel to discuss the findings as presented in the letter report.

This concludes our scope of services for this proposal.

## DELIVERABLES

DiGioia Gray will issue a *Field Reconnaissance Summary Report* as detailed in Task 3 above. The deliverable will be submitted to AEP in Portable Document Format (PDF).

## SCHEDULE

The following table indicates the proposed schedule associated with the completion of each task. DiGioia Gray is prepared to begin the work as soon as authorized by AEP.

**Proposed Milestone Schedule**

| Task                                            | Project Schedule (Business Days) <sup>1,2</sup> |          |
|-------------------------------------------------|-------------------------------------------------|----------|
|                                                 | Per Task                                        | From NTP |
| AEP Issues Notice to Proceed (NTP) <sup>2</sup> | --                                              | N/A      |
| Task 1 – Kick-Off Meeting                       | 0.5                                             | 0.5      |
| Task 2 – Field Reconnaissance                   | 5                                               | 5.5      |
| Task 3 – Letter Report                          | 9                                               | 14.5     |
| Task 4 – Follow-up Meeting                      | 0.5                                             | 15       |

The above schedule indicates 15 business days (three (3) weeks) to project completion from notice to proceed. This does not include possible time necessary to complete additional site investigation (e.g., borings, test pits, laboratory testing), should additional effort be required to delineate a hazard and recommend mitigation.

### Notes:

1. Although DiGioia Gray believes that the schedule is an accurate representation of the proposed schedule for this scope of services, the actual schedule may change based on a number of factors that are beyond our control (e.g., weather conditions, property access, et cetera). DiGioia Gray will make every effort to complete the project as noted herein.
2. The proposed schedule is based on receiving all information within the indicated number of business days. Delays in receiving information may impact other task schedules as well as the overall schedule.

## COST PROPOSAL

This cost proposal assumes that all work will be invoiced at time and billable expenses with all supporting information based on the AEP Consulting Blanket Contract No. 030340170000X103, using the “DiGioia Gray 2019 Rate Sheet for Specialty Engineering & Science Services” that is a part of this contract. This proposal budget will not be exceeded without prior written approval from AEP.

|                                                    |          |
|----------------------------------------------------|----------|
| Task 1: Kick-off Meeting.....                      | \$600    |
| Task 2: Field Reconnaissance (incl. expense) ..... | \$11,500 |
| Task 3: Letter Report .....                        | \$6,500  |
| Task 4: Follow-up Meeting.....                     | \$600    |

**Current Total Cost: ..... \$19,200**

We will monitor the cost of the work as we complete specific tasks of the work. Work will be billed in accordance with our standard rates noted in the above AEP Consulting Blanket Contract. Should the Scope of Services change due to conditions encountered or due to your request, you will be advised of related changes in our fee. We will not exceed our estimated fees without your prior approval.

### **ASSUMPTIONS AND EXCLUSIONS**

In addition to the discussion above, the following additional assumptions and exclusions apply:

- Right-of-entry, escorts (if required) and unrestricted access to the structure locations throughout the duration of the project will be provided by AEP.
- AEP or others will provide to DiGioia Gray any project-related geological, geotechnical, and topographical information that they currently have proper to the commencement of field activities.
- We assume that all site work can be performed in standard Level D personal protective equipment (PPE) during daylight hours (Monday through Friday).
- Our fee does not include any standby time for delays related to weather or other issues outside the control of DiGioia Gray.
- Deliverables will be provided to AEP in electronic format only (PDF). Hard copy reproductions of deliverables can be provided for an additional fee.
- Our fee includes up to two (2) one-hour teleconference attended by two (2) DiGioia Gray personnel.
- Our proposal is based on the assumption that AEP comments will be minor and editorial in nature.
- Our fee does not include any additional investigative activities, above and beyond what has been already described, such as geotechnical borings, test pits, or laboratory testing in support of this Geologic Conditions Assessment. If we determine a need for these activities for this project, it will be handled under a separate proposal and contract.
- This scope does not include environmental characterization, wetlands delineation, permitting, or surveying.

### **LIMITATIONS**

Our work will be performed in a manner consistent with the level of care which is typical of other members of our profession practicing in the same conditions, location, and date our services are provided. This proposal is valid for a period of 30 days from the date of this proposal. This proposal was prepared specifically for AEP and its designated representatives and may not be provided to others without DiGioia Gray's express permission.

### **CLOSING**

We appreciate the opportunity to provide you with this proposal and look forward to working with you on this project. Please issue a Purchase Order for the amount noted herein if you find this proposal acceptable. I will contact you tomorrow to address your comments or questions regarding our proposal.

Sincerely,

**DiGioia Gray & Associates**



Erich V. Zorn, PhD, PG  
Project Manager  
Senior Geologist

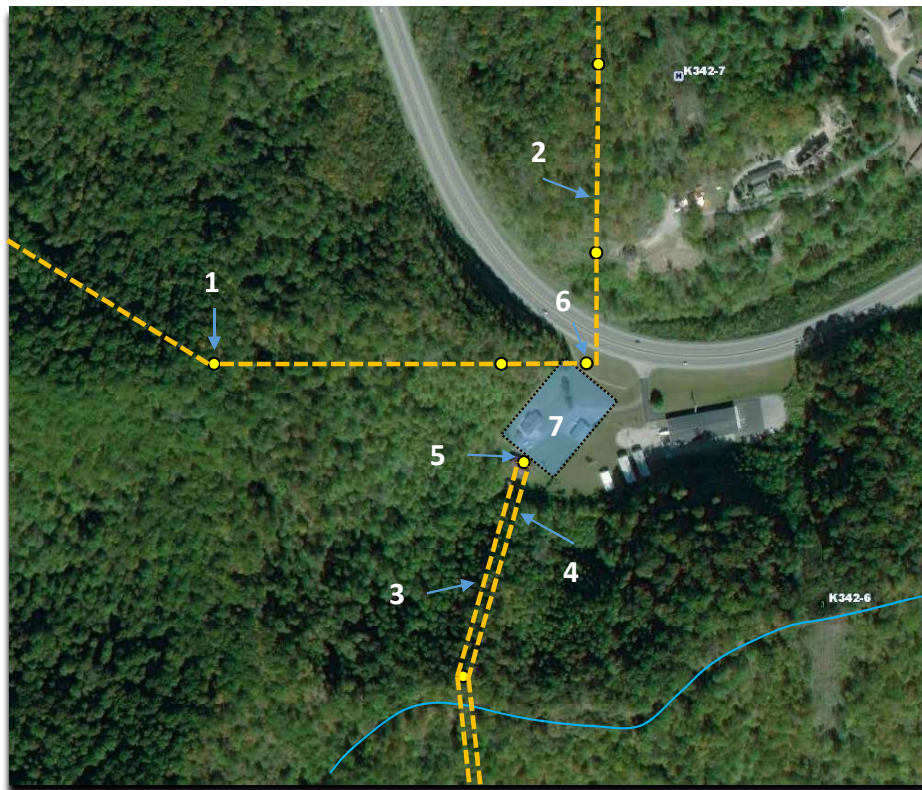
Attachment: Allen Station Relocation, TL Conceptual Plan into Proposed Dwale Station

xc: WGK; NRS; MLS



# Allen Station Relocation

TL Conceptual Plan into Proposed Dwale Station



**1** Old: Allen – Prestonsburg #2 46kV  
New: Dwale – Prestonsburg #2 69kV

**2** Old: Allen – Prestonsburg #1 46kV  
New: Dwale – Prestonsburg #1 69kV

**3** Old: McKinney – Allen 46kV  
New: McKinney – Dwale 69kV

**4** Old: Allen – Stanville 46kV  
New: Dwale – Stanville 69kV

Double circuit structure to roll phases  
**5** from vertical to horizontal configuration  
into Dwale Station bays for (3) and (4).

Double circuit structure to roll phases  
**6** from vertical to horizontal configuration  
into Dwale Station bays for (1) and (2).

**7** Dwale Station

**EXHIBIT 8**

**This Exhibit is a placeholder and is not required for this  
Application**



**EXHIBIT 9**

**This Exhibit is a placeholder and is not required for this  
Application**

**EXHIBIT 10**

# SRRTEP Committee Western AEP Supplemental Projects

July 24, 2019

# AEP Transmission Zone: Supplemental Floyd County, Kentucky

**Need Number:** AEP-2019-AP025

**Process Stage:** Needs Meeting 07/24/2019

**Supplemental Project Driver:**

Equipment Material/ Condition/Performance/Risk

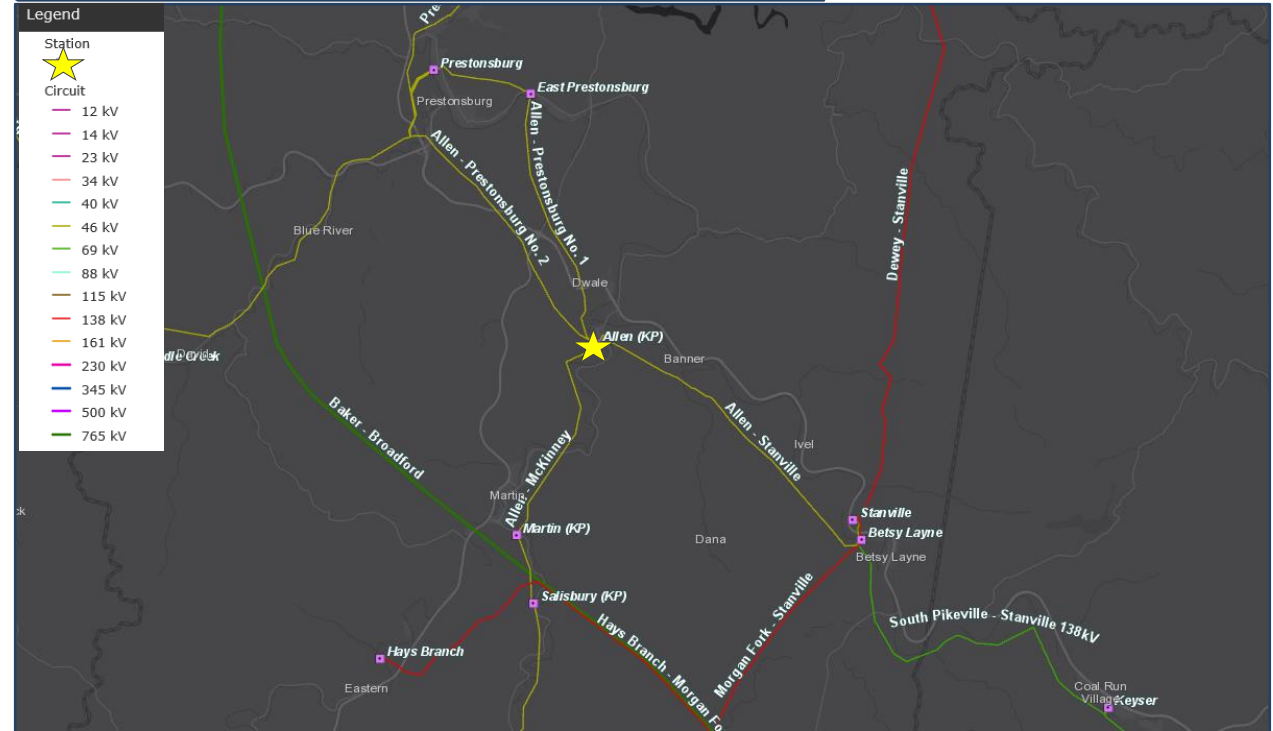
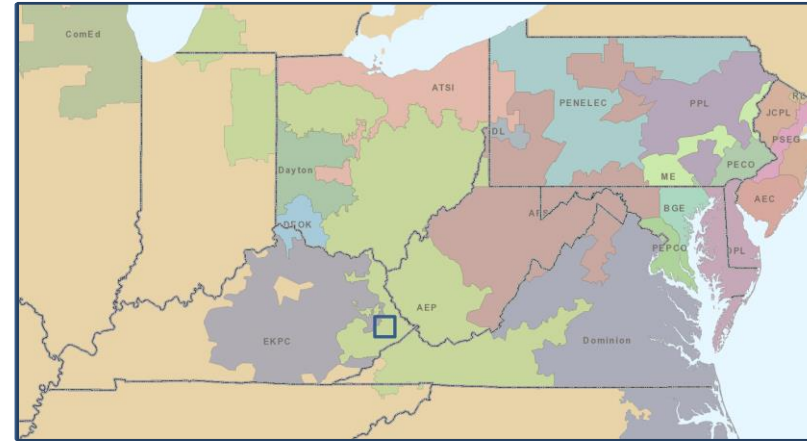
**Specific Assumption References:**

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

**Model:** N/A

**Problem Statement:**

- The existing Allen station has historically experienced severe flooding due to the stations current location in the flood plain. Historical flooding issues have lead to significant deterioration of the stations foundations and structures.
- The 46 kV Circuit Breakers (CBs) A, B, C, & D are oil filled breakers without oil containment manufactured in 1960s. Oil filled breakers have much more maintenance required due to oil handling that their modern, SF6 counterparts do not require. These units comprise 4 of the remaining 12 of the FZO-69-1500P model family on the AEP System. Spare parts for these units are difficult to impossible to procure, and this model type is no longer vendor supported.
- The circuit breakers have experienced the following fault operations, CB A (27), C (20), and D (17). The manufacturer recommendation is 10 fault operations during it's in-service life. In addition, all CBs have documented malfunction records with A, C, and D having at least 1 documented since 2016. These include mainly air leaks, a broken trip latch component, and a trip test switch malfunction. The platform foundations that these are mounted on are crumbling in several locations.
- The 46 kV CS AA is a VBM-69 model type, 1 of 15 remaining on the AEP System. Spare parts for these units are difficult to impossible to procure, and this model type is no longer vendor supported. These circuit switcher models are poor cold weather performers. This unit has 8 documented malfunction records including multiple failures to trip on poles 2 and 3 and one instance in 2011 in which the unit failed to close.



# Sub Regional RTEP Committee: Western AEP Supplemental Projects

October 16, 2020

# AEP Transmission Zone: Supplemental Floyd County, Kentucky

**Need Number:** AEP-2019-AP025

**Process Stage:** Solutions Meeting 10/16/2020

**Previously Presented :** Needs Meeting 07/24/2019

**Supplemental Project Driver:**

Equipment Material/ Condition/Performance/Risk

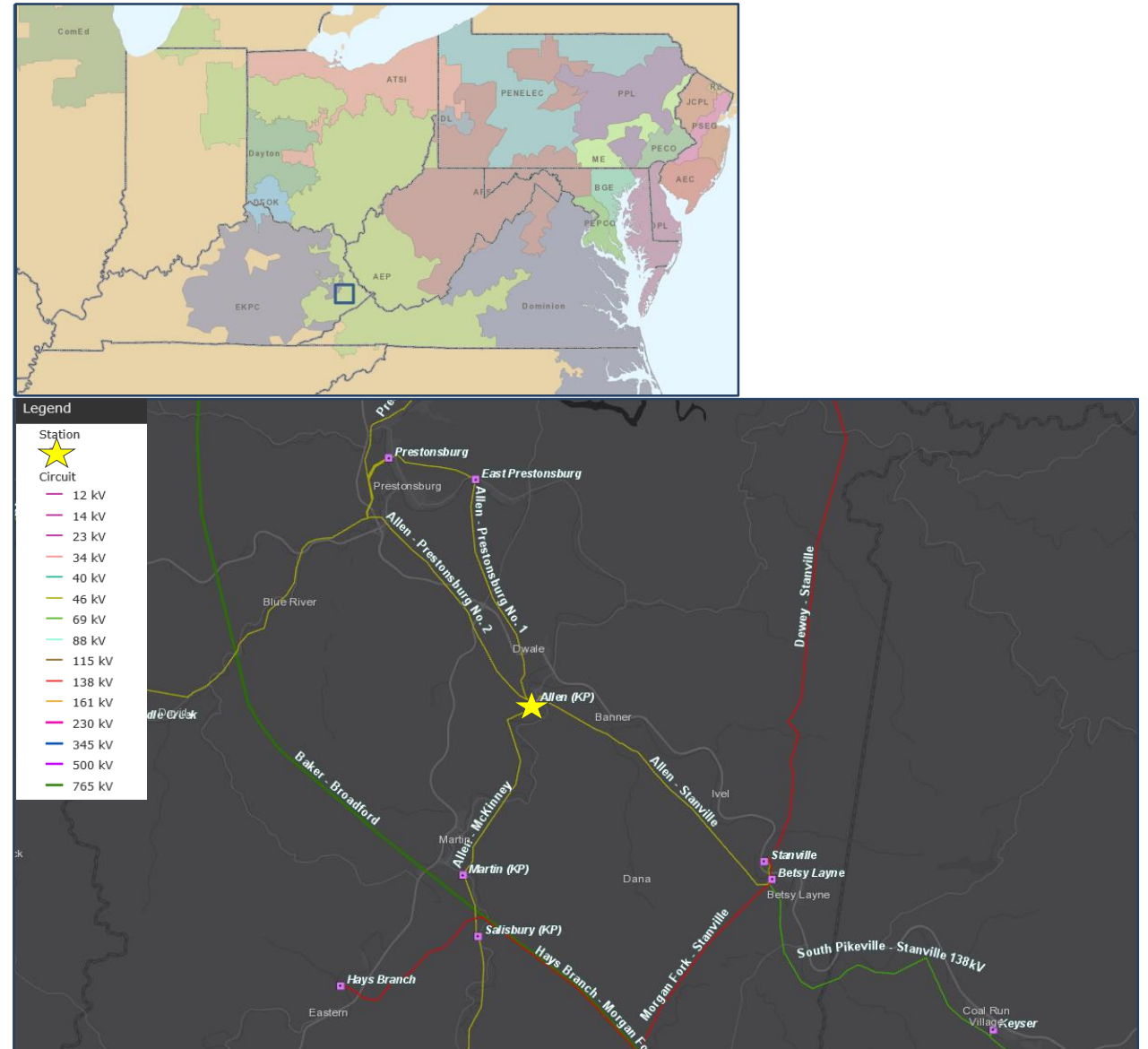
**Specific Assumption References:**

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

**Model:** N/A

**Problem Statement:**

- The existing Allen station has historically experienced severe flooding due to the stations current location in the flood plain. Historical flooding issues have lead to significant deterioration of the stations foundations and structures.
- The 46kV Circuit Breakers (CBs) A, B, C, & D are oil filled breakers without oil containment manufactured in 1960s. Oil filled breakers have much more maintenance required due to oil handling that their modern, SF6 counterparts do not require. These units comprise 4 of the remaining 12 of the FZO-69-1500P model family on the AEP System. Spare parts for these units are difficult to impossible to procure, and this model type is no longer vendor supported.
- The circuit breakers have experienced the following fault operations, CB A (27), C (20), and D (17). The manufacturer recommendation is 10 fault operations during it's in-service life. In addition, all CBs have documented malfunction records with A, C, and D having at least 1 documented since 2016. These include mainly air leaks, a broken trip latch component, and a trip test switch malfunction. The platform foundations that these are mounted on are crumbling in several locations.
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# AEP Transmission Zone: Supplemental Floyd County, Kentucky

**Need Number:** AEP-2019-AP025

**Process Stage:** Solutions Meeting 10/16/2020

**Previously Presented :** Needs Meeting 07/24/2019

## **Proposed Solution:**

### **Allen Substation:**

Rebuild Allen Station to the northwest of its current footprint utilizing a standard air-insulated substation with equipment raised by 7' concrete platforms and control house raised by a 10' platform to mitigate flooding concerns. Install five 69 kV 3000A 40 kA circuit breakers in a ring bus (operated at 46kV) configuration with a 13.2 MVAR capacitor bank. Existing Allen station will be retired

**Estimated Cost: \$10.55 M (Does not include the distribution cost)**

**Distribution Scope of Work:** Install 69/46kV-12kV 20 MVA transformer along with 2-12kV breakers on 7' concrete platforms.

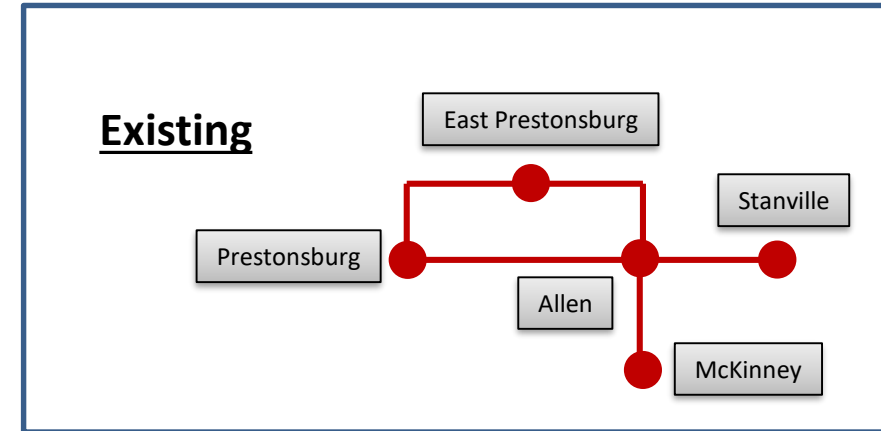
### **Transmission Line:**

**Allen – East Prestonsburg:** A 0.20 mile segment of this 46 kV line will be relocated to the new station. (SN/SE/WN/WE: 53/61/67/73MVA). **Estimated Cost: \$0.33 M**

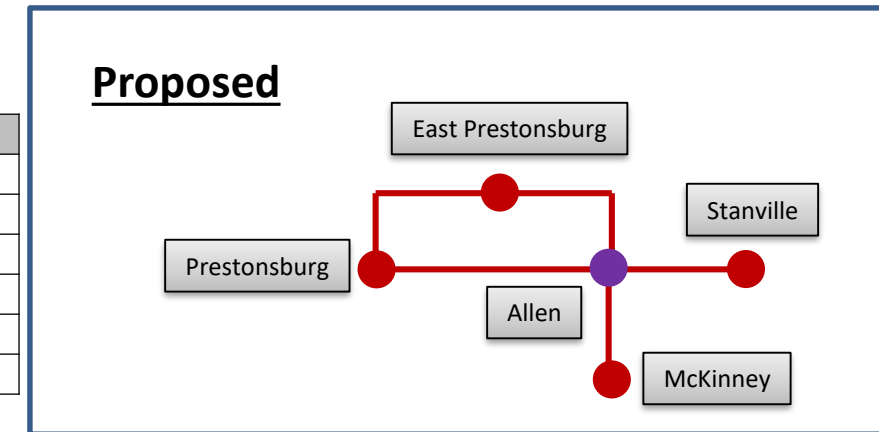
**McKinney – Allen:** The new line extension will walk around the south and east sides of the existing Allen Station to the new Allen Station being built in the clear. A short segment of new single circuit 69kV line and a short segment of new double circuit 69kV line (both operated at 46 kV) will be added to the line to tie into the new Allen Station bays. **Estimated Cost: \$1.95 M**

**Stanville – Allen:** A segment of this line will have to be relocated to the new station (SN/SE/WN/WE: 50/50/63/63MVA). **Estimated Cost: \$0.17 M**

**Allen – Prestonsburg:** 0.25 mile segment of this existing single circuit will be relocated. The relocated line segment will require construction of one custom self-supporting double circuit dead end structure and single circuit suspension structure. A short segment of new double circuit 69kV line (energized at 46 kV) will be added to tie into the new Allen Station bays which will carry Allen – Prestonsburg 46kV and Allen – East Prestonsburg 46kV lines. A temporary 0.15 mile section double circuit line will be constructed to keep Allen – Prestonsburg and Allen – East Prestonsburg 46kV lines energized during construction. **Estimated Cost: \$2.66 M**



| Legend |  |
|--------|--|
| 500 kV |  |
| 345 kV |  |
| 138 kV |  |
| 69 kV  |  |
| 46 kV  |  |
| New    |  |





# AEP Transmission Zone: Supplemental Floyd County, Kentucky

## Proposed Solution (Cont.):

### Remote End

Remote end work will be required at Prestonsburg, Stanville, and McKinney stations. **Estimated Transmission Cost: \$0.34 M**

**Total Estimated Transmission Cost: \$16 M**

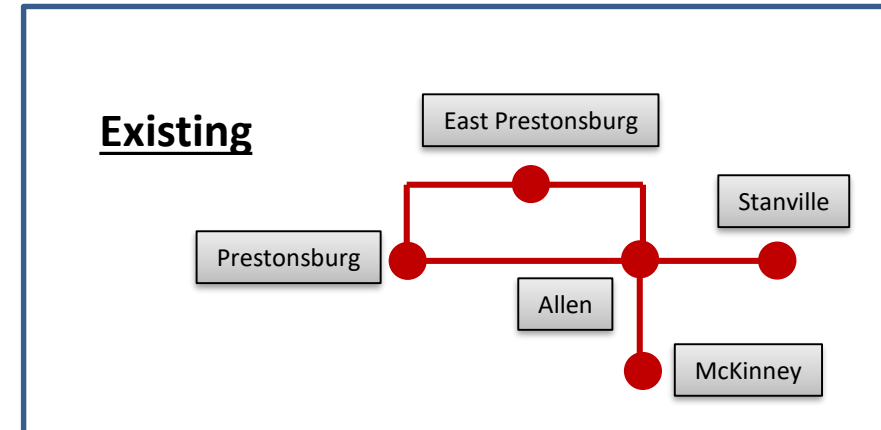
### Alternatives Considered:

Construct a new greenfield substation at a station site identified appx. 1 mile from existing Allen station (A total of 13 sites were reviewed and this site was chosen as being the most prudent location). Install 69/12kV 30 MVA transformer (operated at 46kV) and 2-12kV breakers, Install five 69 kV 3000A 40 kA circuit breakers in a ring bus (operated at 46kV) configuration with a 13.2 MVAR capacitor bank. Construct approximately 1 mile of new 69 kV standard double circuit line between the existing Allen Station and a new station site utilizing the existing Allen – Prestonsburg #1 46 kV circuit ROW. This double circuit line would be used to get the existing Allen – McKinney and Allen - Stanville 46 kV circuits to the newly proposed station site. Construct approximately 0.7 miles of 69 kV single circuit line from about structure 9 on the Allen – Prestonsburg #2 circuit to the new station. Install a new structure (or two) on Allen – Prestonsburg #1 circuit south of structure 7 to bring the line into the new station.

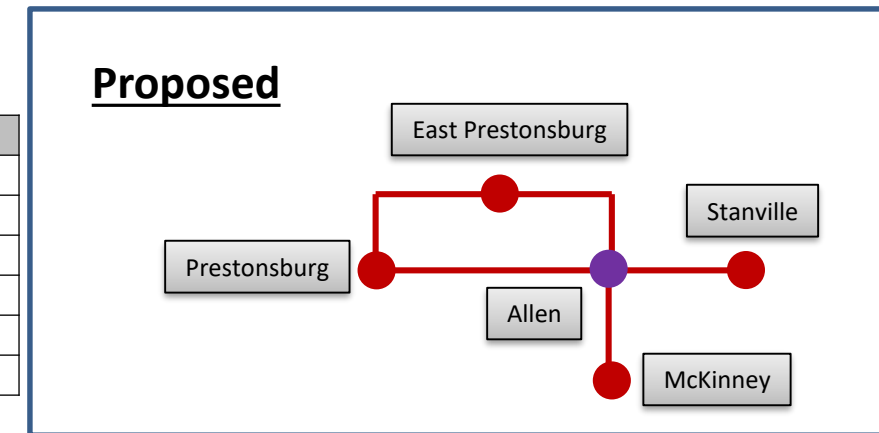
**Estimated Cost: \$31 M (Transmission cost)**

**Project Status:** Scoping

**Projected In Service Date:** 12/31/2023



| Legend |  |
|--------|--|
| 500 kV |  |
| 345 kV |  |
| 138 kV |  |
| 69 kV  |  |
| 46 kV  |  |
| New    |  |



# Reliability Analysis Update

Sub Regional RTEP Committee - PJM West

October 15, 2021

**Process Stage:** First Review

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion &  
Substation Equipment Exclusion

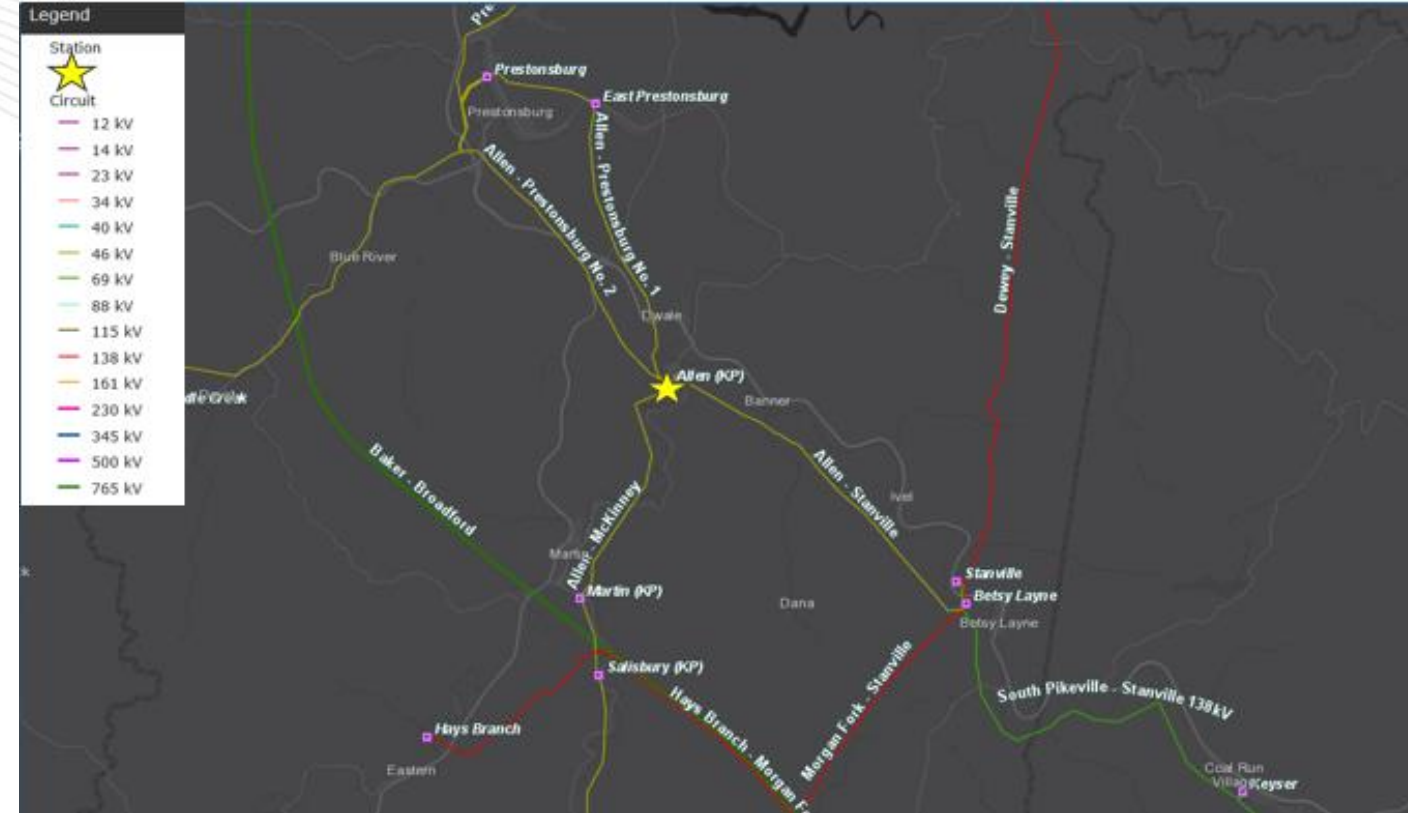
**Problem Statement:**

FG: AEP-T66, AEP-T67, AEP-T68, AEP-T69

In 2026 RTEP winter case, the Stanville - Allen line section is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

| Branch                    | Ratings (SN/SE/WN/WE) |
|---------------------------|-----------------------|
| 05ALLEN- 05STANVILLE 46kV | 47/47/47/47           |
| 05ALLEN- 05EPRESTNS 46kV  | 45/58/60/69           |



## Proposed Solution: Conversion of S2405

**Allen Substation:** Rebuild Allen Station to the northwest of its current footprint utilizing a standard air-insulated substation with equipment raised by 7' concrete platforms and control house raised by a 10' platform to mitigate flooding concerns. Install five 69 kV 3000A 40 kA circuit breakers in a ring bus (operated at 46kV) configuration with a 13.2 MVAR capacitor bank. Existing Allen station will be retired (S2405.1) Estimated Cost: \$10.55 M (Does not include the distribution cost) Distribution Scope of Work: Install 69/46kV-12kV 20 MVA transformer along with 2-12kV breakers on 7' concrete platforms.

**Allen – East Prestonsburg:** A 0.20 mile segment of this 46 kV line will be relocated to the new station. (SN/SE/WN/WE: 53/61/67/73MVA). (S2405.2) Estimated Cost: \$0.33 M

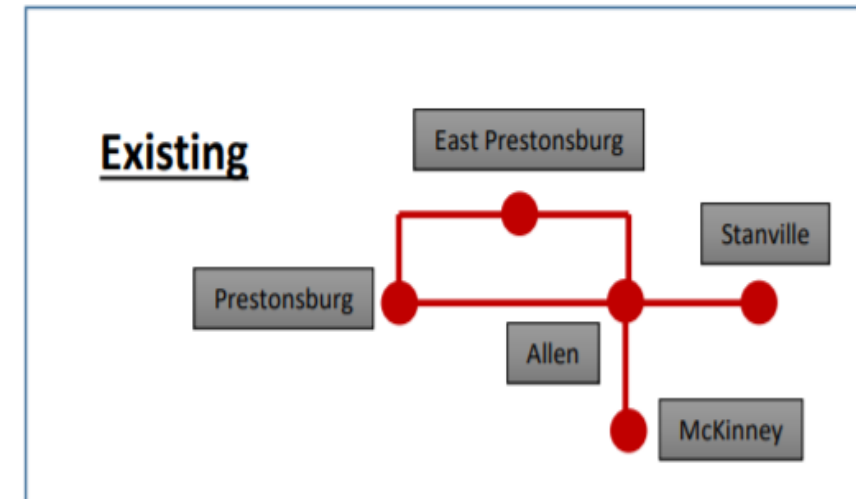
**McKinney – Allen:** The new line extension will walk around the south and east sides of the existing Allen Station to the new Allen Station being built in the clear. A short segment of new single circuit 69kV line and a short segment of new double circuit 69kV line (both operated at 46 kV) will be added to the line to tie into the new Allen Station bays. (S2405.3) Estimated Cost: \$1.95 M

**Stanville – Allen:** A segment of this line will have to be relocated to the new station (SN/SE/WN/WE: 50/50/63/63MVA). (S2405.4) Estimated Cost: \$0.17 M

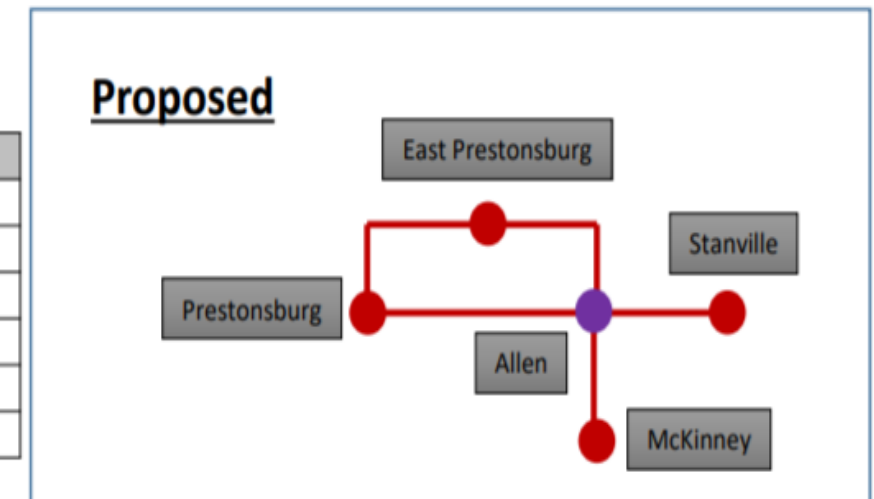
**Allen – Prestonsburg:** 0.25 mile segment of this existing single circuit will be relocated. The relocated line segment will require construction of one custom self-supporting double circuit dead end structure and single circuit suspension structure. A short segment of new double circuit 69kV line (energized at 46 kV) will be added to tie into the new Allen Station bays which will carry Allen – Prestonsburg 46kV and Allen – East Prestonsburg 46kV lines. A temporary 0.15 mile section double circuit line will be constructed to keep Allen – Prestonsburg and Allen – East Prestonsburg 46kV lines energized during construction. (S2405.5) Estimated Cost: \$2.66 M

**Remote End** Remote end work will be required at Prestonsburg, Stanville, and McKinney stations. (S2405.6) Estimated Transmission Cost: \$0.34 M

**Total Transmission Estimated Cost: \$16M**



| Legend |                                                                                       |
|--------|---------------------------------------------------------------------------------------|
| 500 kV |    |
| 345 kV |    |
| 138 kV |  |
| 69 kV  |  |
| 46 kV  |  |
| New    |  |



**Preliminary Facility Rating:**

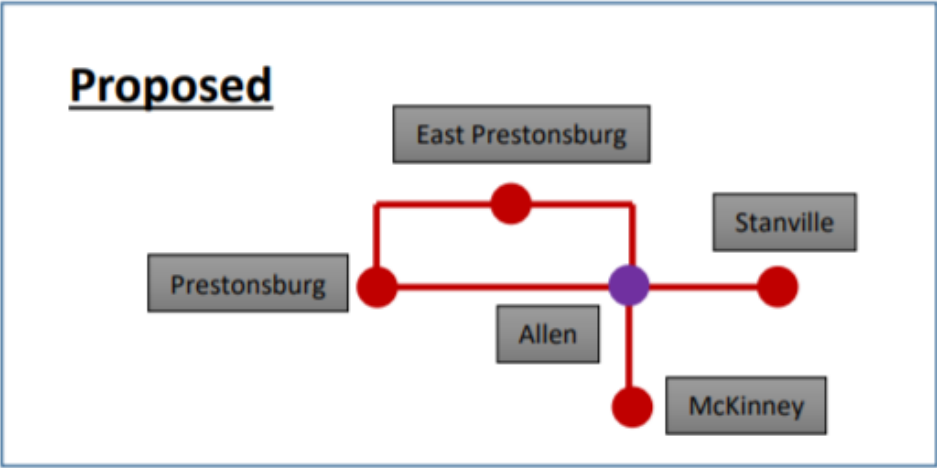
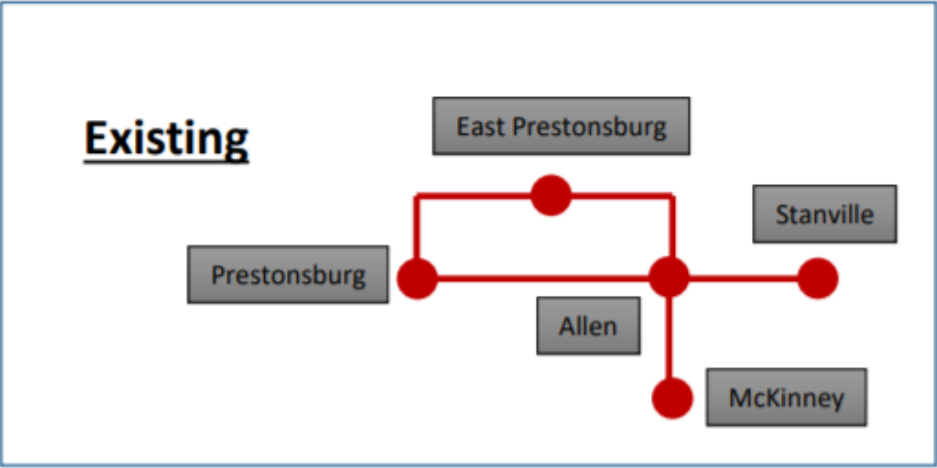
| Branch                    | Ratings (SN/SE/WN/WE) |
|---------------------------|-----------------------|
| 05ALLEN- 05STANVILLE 46kV | 50/50/63/63           |
| 05ALLEN- 05EPRESTNS 46kV  | 53/61/67/73           |

**Ancillary Benefits:** The proposed conversion of the s2405 to baseline does not add any cost to the RTEP. S2405 address issues identified in AEP-2019-AP025.

**Alternatives:** Replace the existing bus and riser conductor in the current Allen station. Considering the timing of the supplemental project can support the required in service date, the additional work in the existing substation would be unnecessary.

**Required IS date:** 12/1/2026

**Projected IS date:** 12/31/2023



| Legend |                                                                                       |
|--------|---------------------------------------------------------------------------------------|
| 500 kV |    |
| 345 kV |   |
| 138 kV |  |
| 69 kV  |  |
| 46 kV  |  |
| New    |  |



# Reliability Analysis Update

Sub Regional RTEP Committee - PJM West

November 19, 2021





# AEP Transmission Zone: Baseline Allen Station Rebuild baseline conversion

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 Criteria

**Assumption Reference:** 2026 RTEP assumption

**Model Used for Analysis:** 2026 RTEP cases

**Proposal Window Exclusion:** Below 200 kV Exclusion

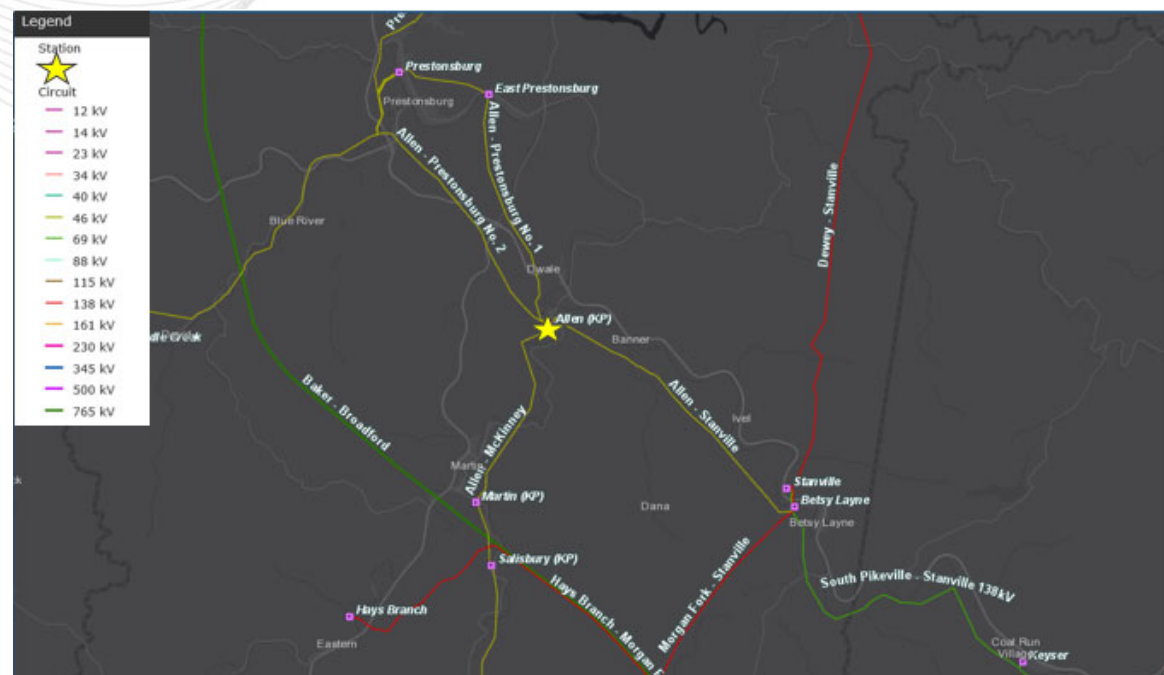
**Problem Statement:**

FG: AEP-T66, AEP-T67, AEP-T68, AEP-T69

In 2026 RTEP winter case, the Stanville - Allen line section is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

| Branch                    | Ratings (SN/SE/WN/WE) |
|---------------------------|-----------------------|
| 05ALLEN- 05STANVILLE 46kV | 47/47/47/47           |
| 05ALLEN- 05EPRESTNS 46kV  | 45/58/60/69           |







## Recommended Solution: Conversion of S2405.1-6

**Allen Substation:** Rebuild Allen Station to the northwest of its current footprint utilizing a standard air-insulated substation with equipment raised by 7' concrete platforms and control house raised by a 10' platform to mitigate flooding concerns. Install five 69 kV 3000A 40 kA circuit breakers in a ring bus (operated at 46kV) configuration with a 13.2 MVAR capacitor bank. Existing Allen station will be retired (original S2405.1) (B3353.1) Estimated Cost: \$10.55 M (Does not include the distribution cost) Distribution Scope of Work: Install 69/46kV-12kV 20 MVA transformer along with 2-12kV breakers on 7' concrete platforms.

**Allen – East Prestonsburg:** A 0.20 mile segment of this 46 kV line will be relocated to the new station. (SN/SE/WN/WE: 53/61/67/73MVA). (original S2405.2) (B3353.2) Estimated Cost: \$0.33 M

**McKinney – Allen:** The new line extension will walk around the south and east sides of the existing Allen Station to the new Allen Station being built in the clear. A short segment of new single circuit 69kV line and a short segment of new double circuit 69kV line (both operated at 46 kV) will be added to the line to tie into the new Allen Station bays. (original S2405.3) (B3353.3) Estimated Cost: \$1.95 M

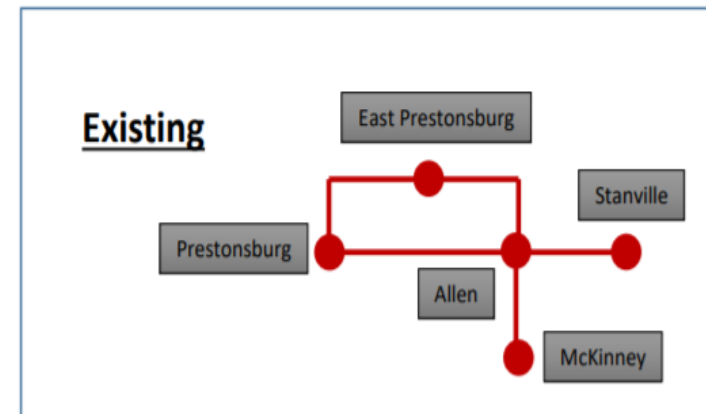
**Stanville – Allen:** A segment of this line will have to be relocated to the new station (SN/SE/WN/WE: 50/50/63/63MVA). (original S2405.4) (B3353.4) Estimated Cost: \$0.17 M

**Allen – Prestonsburg:** 0.25 mile segment of this existing single circuit will be relocated. The relocated line segment will require construction of one custom self-supporting double circuit dead end structure and single circuit suspension structure. A short segment of new double circuit 69kV line (energized at 46 kV) will be added to tie into the new Allen Station bays which will carry Allen – Prestonsburg 46kV and Allen – East Prestonsburg 46kV lines. A temporary 0.15 mile section double circuit line will be constructed to keep Allen – Prestonsburg and Allen – East Prestonsburg 46kV lines energized during construction. (original S2405.5) (B3353.5) Estimated Cost: \$2.66 M

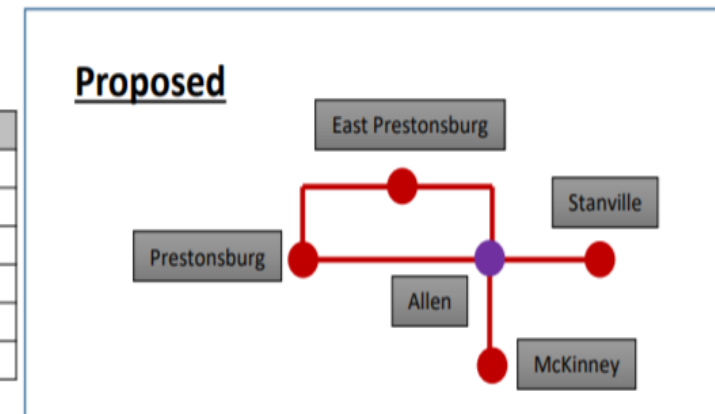
**Remote End** Remote end work will be required at Prestonsburg, Stanville, and McKinney stations. (original S2405.6) (B3353.6) Estimated Transmission Cost: \$0.34 M

**Total Transmission Estimated Cost: \$16M**

## AEP Transmission Zone: Baseline Allen Station Rebuild baseline conversion



| Legend |                                       |
|--------|---------------------------------------|
| 500 kV | <span style="color: red;">—</span>    |
| 345 kV | <span style="color: blue;">—</span>   |
| 138 kV | <span style="color: yellow;">—</span> |
| 69 kV  | <span style="color: green;">—</span>  |
| 46 kV  | <span style="color: red;">—</span>    |
| New    | <span style="color: purple;">—</span> |



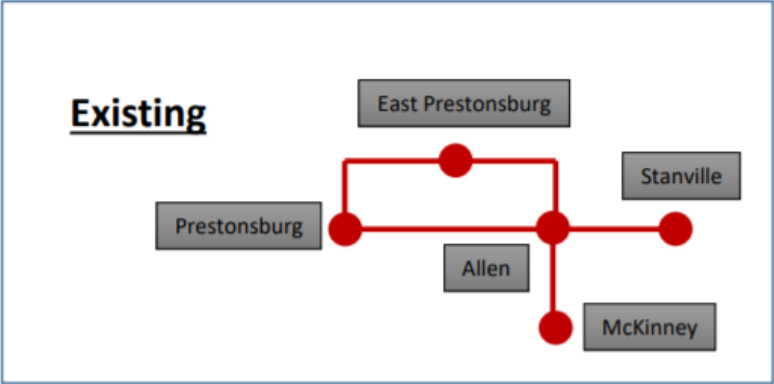


### Preliminary Facility Rating:

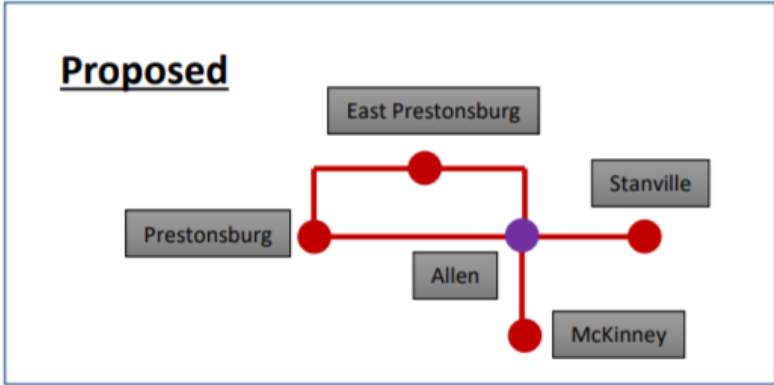
| Branch                    | Ratings (SN/SE/WN/WE) |
|---------------------------|-----------------------|
| 05ALLEN- 05STANVILLE 46kV | 50/50/63/63           |
| 05ALLEN- 05EPRESTNS 46kV  | 53/61/67/73           |

**Ancillary Benefits:** The proposed conversion of the s2405 to baseline does not add any cost to the RTEP. S2405 address issues identified in AEP-2019-AP025.

**Required IS date:** 12/1/2026  
**Projected IS date:** 12/31/2023  
**Previously Presented:** 10/15/2021



| Legend |                                                                                       |
|--------|---------------------------------------------------------------------------------------|
| 500 kV |    |
| 345 kV |    |
| 138 kV |    |
| 69 kV  |   |
| 46 kV  |  |
| New    |  |



**EXHIBIT 11**

**This Exhibit is a placeholder and is not required for this  
Application**

**EXHIBIT 12**

**This Exhibit is a placeholder and is not required for this  
Application**

**EXHIBIT 13**

| Proposed Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Alternative Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Dismissed Alternative                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Rebuild Allen station on the existing station footprint with a 10ft expansion.</li> <li>• Install (4) 69KV circuit breakers to support the (4) 46KV transmission lines exits, (1) 46/12KV 20MVA transformer, (1) 12KV distribution bay with (2) distribution line exits.</li> <li>• Raise all major equipment in the station at least 8ft to avoid potential flooding.</li> <li>• 0.37 miles of Line removal and 0.33 miles of new line construction.</li> </ul> | <ul style="list-style-type: none"> <li>• Rebuild Allen station on an alternative site which would need new grading, and potential wetland mitigation.</li> <li>• Install (6) 69KV circuit breakers to support the (4) 46KV transmission lines exits, (1) 46/12KV 20MVA transformer, (1) 12KV distribution bay with (2) distribution line exits.</li> <li>• Depending on the flood elevation on the alternative site equipment will potentially still need to be raised.</li> <li>• Potential Landslide Risk per completed study.</li> <li>• Construction activities will impact major highway (US 23) due to new line crossing.</li> <li>• 3.34 miles of Line removal and 2.61 miles of new line construction.</li> </ul> | <ul style="list-style-type: none"> <li>• Expand Allen station increasing the station footprint approximately 2400 square feet.</li> <li>• Install (6) 69KV circuit breakers to support the (4) 46KV transmission lines exits, (1) 46/12KV 20MVA transformer, (1) 12KV distribution bay with (2) distribution line exits.</li> <li>• Raise all major equipment in the station at least 8ft to avoid potential flooding.</li> <li>• Would require significant environmental permitting and earthwork</li> <li>• Approx. 0.37 miles of Line removal and 0.33 miles of new line construction.</li> </ul> |