PJM Facilities Study Report

For

Network Upgrade N9208

Transition Cycle #1

June 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff and PJM Manuals. The Transmission Owner (TO) is Virginia Electric and Power Company (VEPCO or Dominion).

A. Project Description

The System Impact Study for PJM Interconnection Transition Cycle #1 has identified the need for PJM Network Upgrade N9208. The scope of this Network Upgrade includes the following:

- Upgrade 6.87 Miles of 115kV transmission line 136 from Earleys to Ahoskie

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9208:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9208. These facilities shall be designed according to the Transmission Owner's Applicable Technical Requirements and Standards. Once built the Transmission Owner will own, operate, and maintain these facilities.

See Preliminary Scoping Summaries located in the Appendices, Attachment #1, #2 and #3.

2. MILESTONE SCHEDULE FOR COMPLETION OF DOMINION WORK

Facilities outlined in this report are estimated to take 43 months to construct, from the time of full execution of the Generation Interconnection Agreement and completion of a construction kickoff call. This schedule may be impacted by the timeline for procurement and installation of long lead items and the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Engineering	1	30
Permitting/Procurement	3	38
Construction	36	43

Due to outage congestion, Network Upgrades and/or internal Dominion projects have been identified as having possible outage conflicts with this network upgrade that may affect the estimated milestones listed above. Additional outage sequencing may be required that includes, but not limited to, the following projects:

- Project 9922987 – Rebuild Line 136
- Project 993045 – Rebuilding transmission lines connecting to Earleys Substation

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- The preliminary construction schedule is dependent on outage availability.
- See Attachment 1 and 2– Preliminary Scoping Summary – Substation for additional assumptions
- See Attachment 3 – Preliminary Scoping Summary – Transmission line for additional assumptions

4. LAND REQUIREMENTS

Dominion will be responsible for the following expectations in the area of Real Estate:

- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Any other Land/Permitting requirements required by the Network Upgrade

5. ENVIRONMENTAL AND PERMITING

The Dominion will be responsible for the following expectations in the area of Environmental and Permitting:

- Assessment of environmental impacts related to the Network Upgrade including:
    - Environmental Impact Study requirements
    - Environmental Permitting
- A stormwater easement and/or specific stormwater design BMP's to allow access to and use of the facilities, including a maintenance agreement for said stormwater facilities.
- Conditional Use Permit for Substation
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation
- Any other Permitting requirements required by the Network Upgrade

C. APPENDICES

Attachment #1: Preliminary Scoping Summary – Substation Ahoskie

Attachment #2: Preliminary Scoping Summary – Substation Earleys

Attachment #3: Preliminary Scoping Summary – Transmission

Attachment #1

Project Number: N9208 – Ahoskie Substation

Project Description: Replace Line Lead for Line 136

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9208 provides for the rebuild of line 136 and replacement of line lead for line 136 at Ahoskie Substation in Hertford County, North Carolina.

Purchase and install substation material – Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Attachment #2

Project Number: N9208 – Earleys Substation

Project Description: Replace Line Lead for Line 136

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9208 provides for the rebuild of line 136 and replacement of line lead for line 136 at Earleys Substation in Hertford County, North Carolina.

Purchase and install substation material – Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Purchase and install relay material – Network Upgrade:

1. One (1), 1340 – 24” dual SEL-411L DCB/PLC line panel

Remove relay material – Network Upgrade:

1. Remove Panel No. 33

Attachment #3

115 kV LINE #136

Earleys - Ahoskie

PROJECT N9208

PRELIMINARY SCOPING SUMMARY

This project serves to rebuild 115 kV line 136 from Earleys Substation to Ahoskie Substation for approximately 6.87 miles, which is located in Hertford County, NC. See **Figure 1** for the project location. The proposed work requires additional land to meet DEV right of way standards. The existing right of way width is 85 ft and 15 ft of additional right of way will be acquired. However, the project work can be completed within the existing right of way. The project will install a total of eighty-three (83) new structures. This project will require a CPCN filing.

The existing line consists of primarily wood single circuit monopoles built in 1965. The proposed structures to be installed are primarily single circuit engineered steel monopoles. The existing 559.5 AAAC, and 636 ACSR "Rook" conductor will be replaced with 3-phase 768.2 ACSS/TW/HS "Maumee" conductor. The existing 123.3 AAAC and 3#6 Alumoweld shield wire will be replaced with two (2) DNO-11410 OPGW and 7#7 Alumoweld shield wire.

This project scope assumes that it is independent of project N9213 network upgrade, which plans to wreck and rebuild approximately7.98 miles of line 136 from Tunis to Ahoskie, that's included in Transition Cycle 1 Phase 3.

Design Considerations:

EXISTING FACILITIES TO BE REMOVED:

1. Remove sixty-seven (67) existing 115 kV single circuit wood suspension monopole structures as follows:
    a. Structures 136/89, 91-96, 98, 100-101, 103-106, 109-130, 134-137, 139-152, 154-160, and 162-167.

2. Remove five (5) existing 115 kV single circuit weathered steel suspension monopole structures as follows:
    a. Structures 136/107, 131, 138, 153, and 169

3. Remove four (4) existing 115 kV single circuit wood running angle monopole structures as follows:
    a. Structures 136/90, 99, 108, and 161

4. Remove one (1) existing 115 kV single circuit weathering steel running angle monopole structure as follows:
    a. Structure 136/97

5. Remove two (2) existing 115 kV single circuit wood monopole double deadend structures as follows:

a. Structures 136/102 and 136/168

6. Remove two (2) existing 115 kV single circuit wood 3-pole double deadend structures as follows:
    a. Structures 136/132, and 136/133

7. Remove one (1) existing 115 kV single circuit weathering steel 3-pole double deadend structure as follows:
    a. Structures 136/88

8. Remove one (1) existing 115 kV single circuit concrete 3-pole double deadend structure as follows:
    a. Structure 136/88S

9. Remove approximately 6.84 miles of 559.5 AAAC (19 5005/0) from existing structure 136/88C to existing structure 136/170.

10. Remove approximately 0.03 miles of 636 ACSR (24/7) from existing structure 136/170 to existing structure 136/171.

11. Remove approximately 6.74 miles of one (1) 123.3 AAAC shield wire from existing structure 136/88 to existing structure 136/170.

12. Remove approximately 0.07 miles of one (1) 3#6 alumoweld shield wire from existing structure 136/88C to existing structure 136/88

13. Remove approximately 0.02 miles of two (2) 7#7 alumoweld shield wire from existing structure 136/170 to existing structure 136/171.

EXISTING FACILITIES TO BE MODIFIED:

1. Remove and replace three (3) 115kV strain conductor assemblies per structure with new 115kV strain conductor crossing assemblies [Reference Drawing 31.340] on the following two (2) structure:
    a. 136/88C and 136/171
2. Remove and replace six (6) 115kV strain conductor assemblies with new 115kV strain conductor crossing assemblies [Reference Drawing 31.340] on the following one (1) structure.
    a. 136/170
3. Remove and replace one (1) shield wire deadend assembly with two (2) new OPGW deadend assemblies [Reference Drawing 96.060] on the following one (1) structure:
    a. 136/88C

4. Remove and replace two (2) shield wire deadend assembly with two (2) new OPGW deadend assemblies [Reference Drawing 96.061] on the following one (1) structure:
    a. 136/171
5. Remove and replace three (3) shield wire deadend assemblies with four (4) new OPGW deadend assemblies [Reference Drawing 96.060] on the following one (1) structure:
    a. 136/170

PERMANENT FACILITIES TO BE INSTALLED:

1. Install seventy-two (72) 115 kV engineered steel single circuit suspension monopole structures [Reference Drawing 11.420] on foundations as follows:
    a. Structures 136/89, 91-96, 98, 100-101, 103-107, 109-131, 134-160, 162-167, and 169
    b. See **Figure 2** for a visual of the proposed structure design.

2. Install three (3) 115 kV engineered steel single circuit double deadend monopole structures [Reference Drawing 11.430] on foundations as follows:
    a. Structures 136/90, 97, and 99
    b. See **Figure 3** for a visual of the proposed structure design.

3. Install eight (8) 115 kV engineered steel single circuit double deadend 3-pole structures [Reference Drawing 12.158 - 115kV configuration] on foundations as follows:
    a. Structures 136/88S, 88, 102, 108, 132, 133, 161, and 168
    b. See **Figure 4** for a visual of the proposed structure design.

4. Install approximately 6.87 miles of 3-phase single (1) 768.2 ACSS/TW/HS (20/7) “Maumee” conductor from existing backbone 136/88C to existing backbone 136/171.

5. Install approximately 6.87 miles of two (2) DNO-11410 OPGW from existing structure 136/88C to existing backbone 136/171.
    a. This includes the installation of ten (10) total fiber splices as follows
        i. Two (2) splices on structures 136/88C, 136/108, 136/133, 136/161 and 136/171.

CONCEPTUAL SCOPE NOTES:

1. The existing line consists primarily of single circuit wood monopole structures installed in 1965. These structures are considered insufficient for the proposed conductor, resulting in the need for the line to be rebuilt. No PLS-CADD modeling was done for this project. Structures were replaced like for like and estimated using typical transmission right of way characteristics.
2. Structures are designed based off the following NESC code parameters: NESC Heavy, 90 mph wind, ¾” Ice & 30 mph wind regardless of project location.
3. It is assumed for detailed engineering that a LiDAR survey will be required.

4. An existing right of way width of 85 ft and 205 ft is assumed based on map viewer. Project

N9208 will be acquiring an additional 15 ft of ROW to meet DEV standards where the existing right of way width is 85 ft; however, this project is able to meet ROW requirements in the 85' ROW.

5. A wetland delineation has not been completed as part of this conceptual package.
6. Wire reel lengths were not accounted for this line design. The assumed pull pad locations to avoid tension splices will be determined during detailed design.
7. Alternative design options for the proposed structures are direct embed DOM H-frame structures. Monopole structure designs were utilized to stay within the existing right of way.
8. This project scope assumes that it is independent from project N9213 which is another network upgrade included in Transition Cycle 1 - Phase 3. The following projects may impact the project scope if this assumption is incorrect.
    a. N9213 - Wreck and rebuild 7.98 miles of 115 kV line 136 from Tunis to Ahoskie
    b. N9210 - Replace Line Switch at Ahoskie 115 kV
    c. N7541 - Add a 3rd 230 kV transformer at Earleys substation plus new 230 kV Breakers
    d. N9209 - Replace Wave Trap at Earleys 115 kV
    e. N6138 – Wreck and rebuild 13.74 miles of 230 kV line 246 from Nucor Tap to Earleys substation
9. Critical crossings for Line 136 are:
    a. Between structures 136/98 and 136/99 crosses over 1st Street West
    b. Between structures 136/132 and 136/133 crosses over Route 11
    c. Between structures 136/167 and 136/168 crosses over Route 11

CONCEPTUAL ESTIMATE NOTES:

1. Engineered steel pole costs were determined based off typical wind and weight spans, line angles, and average structure heights in the typical right of way associated with the structure type.

2. Steel pole foundation costs were based off the projects' location and structure type in the regional soil profile map. The regional soil profile map used for this project is Coastal Planes West.

3. The conceptual estimate assumes that a laydown yard is required for this project.
4. Prior to detailed engineering, a full land rights review would be required. A desktop review was completed to estimate the project cost.

5. Access estimate cost inputs include the following assumptions:

a. Work pad totals based on provided SOW and assumptions from kmz file. Assume 15 mats for tangents and 30 mats for angles at each work pad for reconductor work and 50 mats per pull pad.
b. DDE structures assumed based off of wire reel lengths - based off of pull pad locations.
c. Pull pad locations based on location of major road/water crossings and line mileage.
d. Assuming that existing stone in Substations will be used for access per SOW and that access is existing or will be built by others before the start of construction. Assumes that the substations will be constructed with access roads built to and from Substations and work from inside the substations for Backbone installation.
e. Assumes no delays due to permitting or real estate issues after work begins. Assume no schedule compressions from SOC/PJM.
f. Assumes all clearing and forestry costs have been captured by others. No access costs for forestry activities included in this pricing.
g. Stream crossing based on estimates from aerial imagery.
h. Assumes that all existing roads may be dressed with stone that can remain at the end of the project. Assumes existing two track roads in many locations will be impermeable. No costs for stone road removal are included.

Figure 1 – Project Locatio

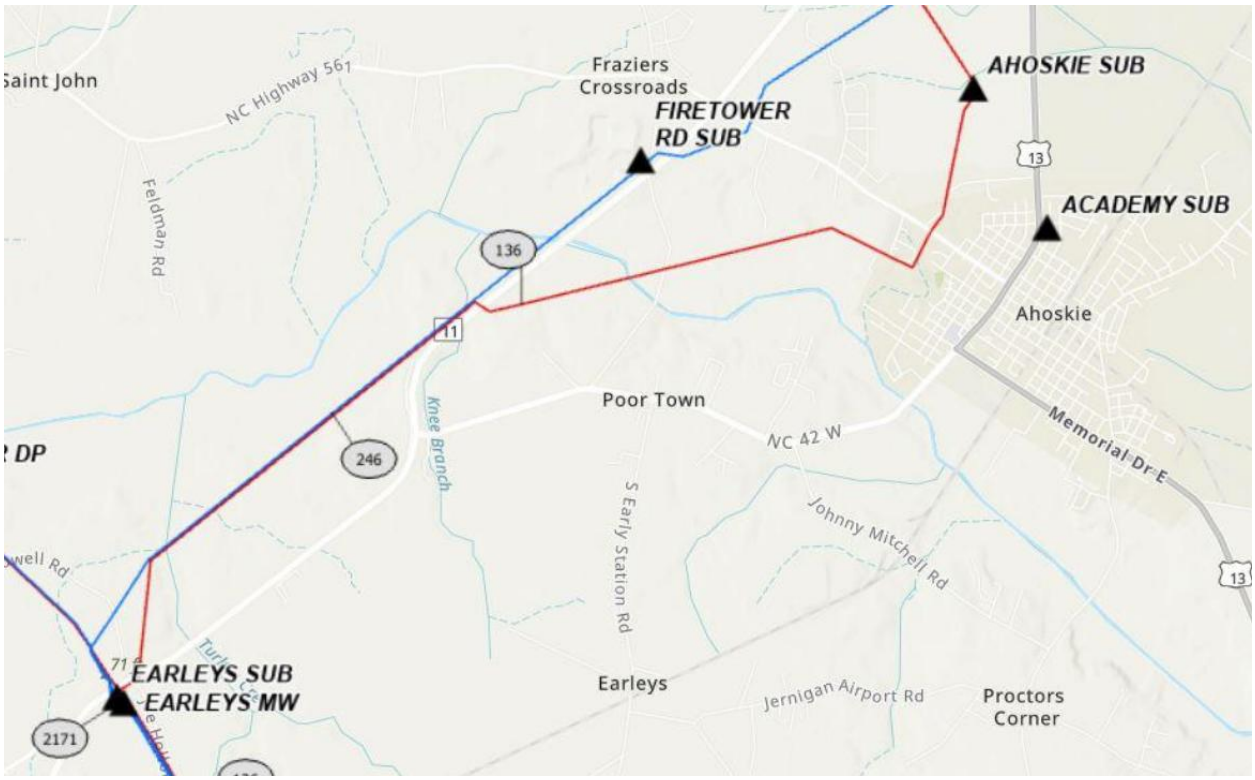


Figure 2 – Proposed Suspension Structure Configuration

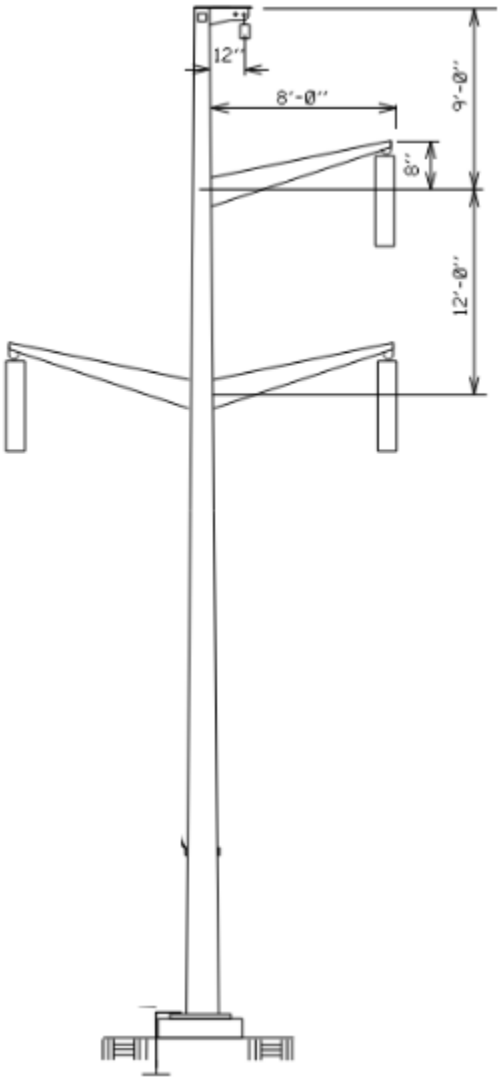


Figure 3 – Proposed Double Deadend Structure Configuration

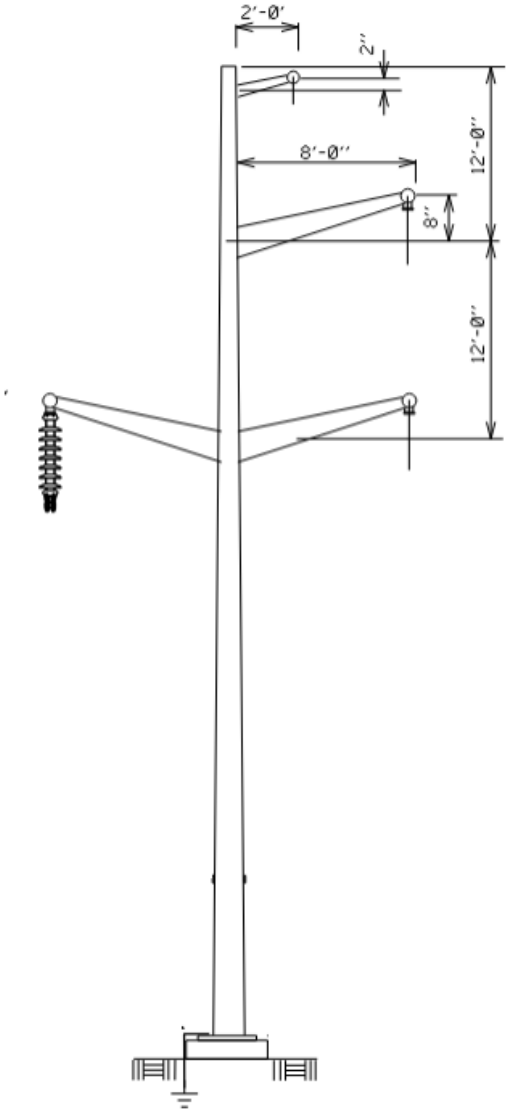
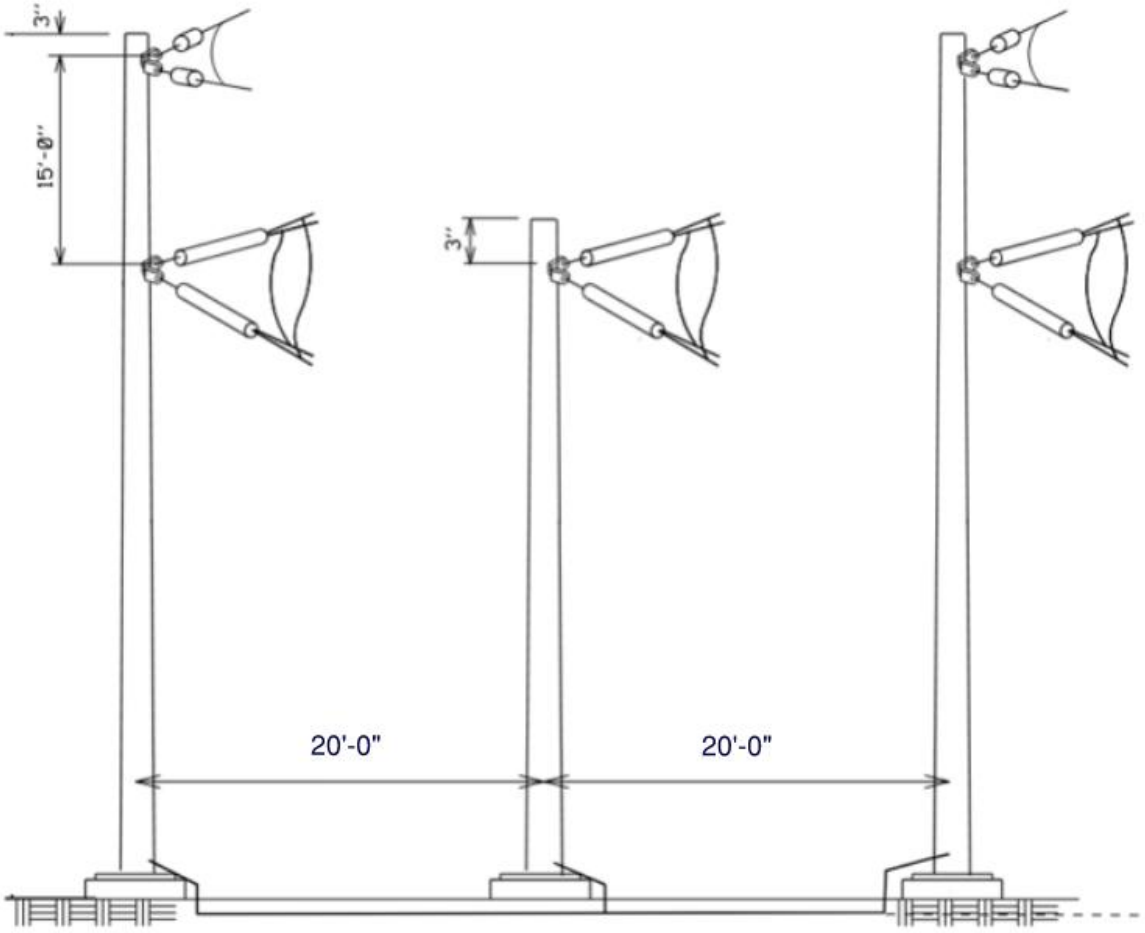


Figure 4 – Proposed Double Deadend Structure Configuration



Required Material Summary

Item	Qty
Engineered Structures	83
12,000-Ft OPGW Reels	8
12,000-Ft Conductor Reels	10