PJM Facilities Study Report

For

Network Upgrade N9213

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 N9213. The scope of this Network Upgrade includes the following:

- Upgrade 7.98 Miles of 115kV transmission line 136 from Tunis to Ahoskie

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9213:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9213. 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 992987 Rebuild line 136
- Project 993045 Rebuild 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 Tunis

Attachment #3: Preliminary Scoping Summary – Transmission

Attachment #1

Project Number: N9213 – 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 N9213 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: N9213 – Tunis Substation

Project Description: Replace Line Lead for Line 136

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9213 provides for the rebuild of line 136 and replacement of line lead for line 136 at Tunis 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. 1

Attachment #3

115 kV LINE #136

Tunis - Ahoskie

PROJECT N9213

PRELIMINARY SCOPING SUMMARY

This project serves to rebuild 115 kV line 136 from Tunis Substation to Ahoskie Substation for approximately 7.98 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 varies from 175 ft and 85 ft. 15 ft of additional right of way will be acquired where the existing right of way is 85 ft. However, the project work can be completed within the existing right of way. The project will install a total of eighty-eight (88) new structures. This project will require a CPCN filing.

The existing line consists mainly of wood, single circuit monopoles built in 1969. The proposed structures to be installed are primarily single circuit engineered steel monopoles. The existing single (1) 545.6 ACAR (15/7) conductor will be replaced with single (1) 768.2 ACSS/TW (20/7) "Maumee" conductor. The existing one (1) 3#6 Alumoweld shield wire will be replaced with two (2) DNO-11410 OPGW.

This project scope assumes that it is independent of project N9208 network upgrade, which plans to wreck and rebuild approximately 6.87 miles of line 136 from Earleys to Ahoskie, that is 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 136/4-6, 8-23, 25-36, 38-39, 42-46, 49-57, 61, 63-67, 69-71, 74-80, 83-85, and 87

2. Remove eleven (11) existing 115 kV single circuit weathered steel suspension monopole structures as follows:
    a. Structures 136/7, 37, 40-41, 48, 59, 62, 72-73, 82 and 86

3. Remove four (4) existing 115 kV single circuit wood running angle monopole structures as follows:
    a. Structures 136/24, 47, 58, and 60

4. Remove three (3) existing 115 kV single circuit wood monopole double deadend structures as follows:
    a. Structures 136/1, 68, and 81

5. Remove two (2) existing 115 kV double circuit wood suspension monopole structures as follows:
    a. Structures 136/2 (108/366) and 136/3 (108/365)

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

7. Remove approximately 7.98 miles of single (1) 545.6 ACAR (15/7) conductor from existing structure 136/1A to existing structure 136/88C.

8. Remove approximately 7.98 miles of one (1) 3#6 alumoweld shield wire from existing structure 136/1A to existing structure 136/88C.

EXISTING FACILITIES TO BE MODIFIED:

1. Remove and replace three (3) 115kV strain conductor assemblies per structure with new 115kV strain assemblies [Reference Drawing 31.340] on the following two (2) structures:
    a. 136/1A and 136/88C

2. Remove and replace two (2) shield wire deadend assemblies per structure with new OPGW deadend assemblies [Reference Drawing 96.060] on the following two (2) structures:
    a. 136/1A and 136/88C

PERMANENT FACILITIES TO BE INSTALLED:

1. Install seventy-eight (78) 115 kV engineered steel single circuit suspension monopole structures [Reference Drawing 11.420] on foundations as follows:
    a. Structures 136/4-23, 25-46, 48-57, 59, 61-67, 69-80, and 82-87
    b. See **Figure 2** for a visual of the proposed structure design.

2. Install five (5) 115 kV engineered steel single circuit deadend monopole structures [Reference Drawing 11.430] on foundations as follows:
    a. Structures 136/1, 24, 47, 58, and 60
    b. See **Figure 3** for a visual of the proposed structure design.

3. Install three (3) 115 kV engineered steel single circuit double deadend 3-pole structures [Reference Drawing 12.158 – 115 kV configuration] on foundations as follows:
    a. Structures 136/68, 81, and 88N
    b. See **Figure 4** for a visual of the proposed structure design.

4. Install two (2) 115kV double circuit monopole suspension structures [Reference Drawing 11.412] on foundations as follows:
    a. Structures 136/2 (108/366) and 136/3 (108/365)
    b. See **Figure 5** for a visual of the proposed structure design.

5. Install approximately 7.98 miles of 3-phase single (1) 768.2 ACSS/TW/HS (20/7) “Maumee” conductor from existing backbone 136/1A to existing backbone 136/88C.

6. Install approximately 7.98 miles of two (2) DNO-11410 OPGW from existing structure 136/1A to existing structure 136/88C.
    a. This includes the installation of ten (10) splices as follows:
        i. Two (2) splices on structures 136/1A, 24, 47, 68 and 88C.

CONCEPTUAL SCOPE NOTES:

1. The existing line consists primarily of single circuit wood monopole structures installed in 1969. 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 varies between 175 ft (from structure 136/1A to 136/81) and 85 ft (from structure 136/80 to 136/88C). An additional 15 ft of right of way will be acquired from structure 136/81 to 136/88C; however, this project can maintain right of way clearances within the existing 85 ft 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. This project scope assumes that it is independent from project N9208 which is in another network upgrade included in Transition Cycle 1 – Phase 3. The following projects may impact the project scope if this assumption is incorrect.
    a. N9208 – Wreck and rebuild 6.87 miles of 115 kV line 136 from Earleys to Ahoskie
    b. N9210 – Replace Line Switch at Ahoskie 115kV
8. Critical crossings for Line 136 are:
    a. Between structures 136/17 and 136/18 crosses over Highway 45
    b. Between structures 136/66 and 136/67 crosses over Highway 13
    c. Between structures 136/70 and 136/71 crosses over Old Highway 11
    d. Between structures 136/80 and 136/81 crosses over Horse Swamp

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 Location

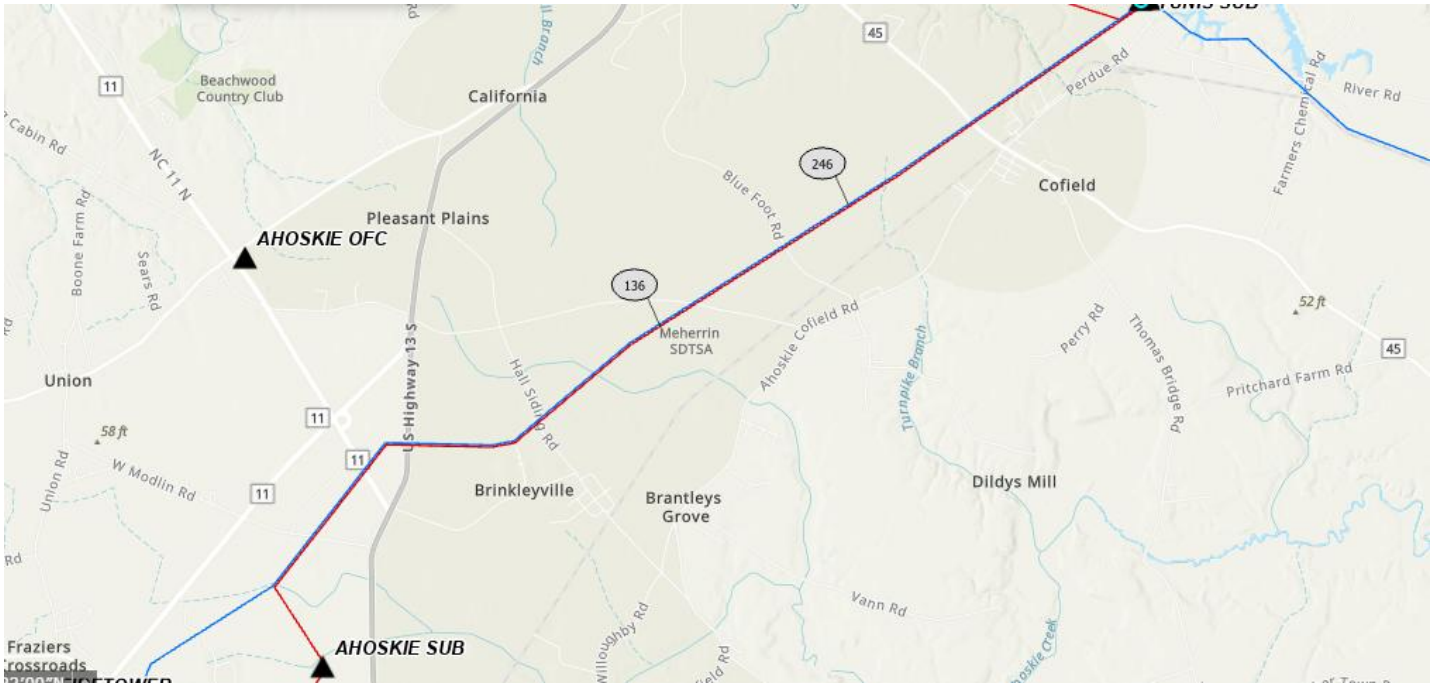


Figure 2 – Proposed Single Circuit Suspension Structure Configuration

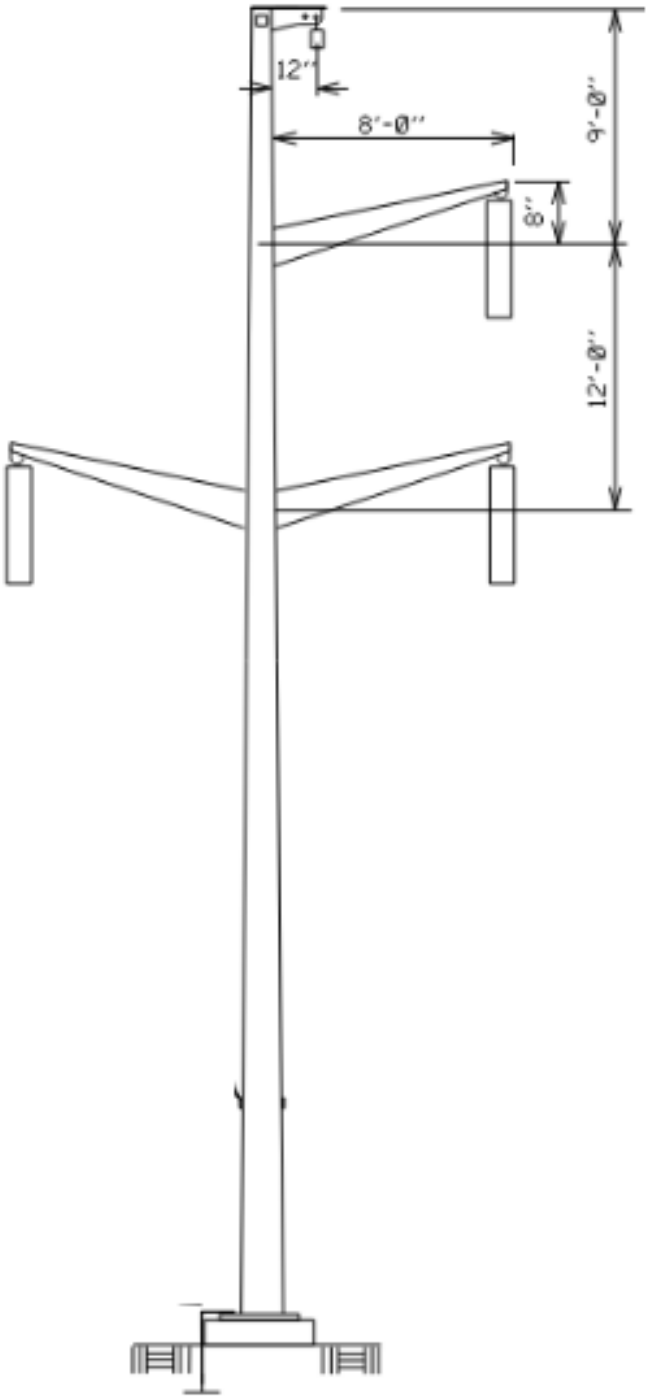


Figure 3 – Proposed Single Circuit Double Deadend Structure Configuration

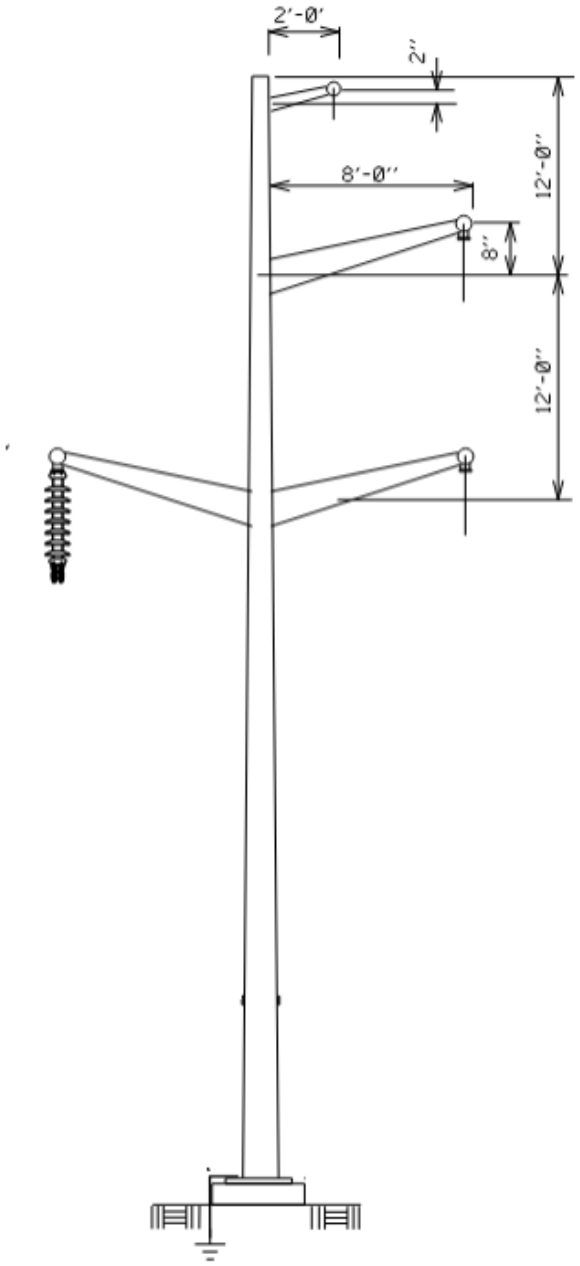


Figure 4 – Proposed Double Deadend Structure Configuration

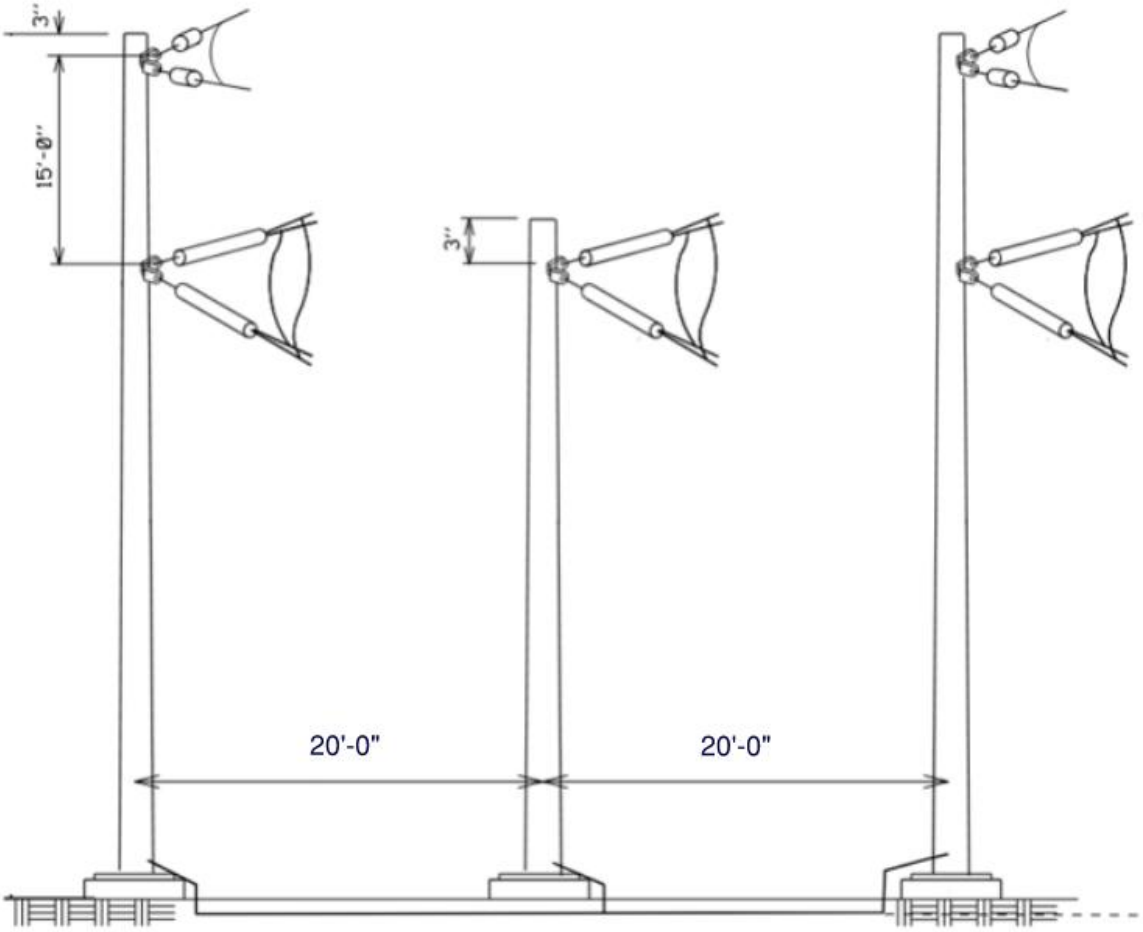
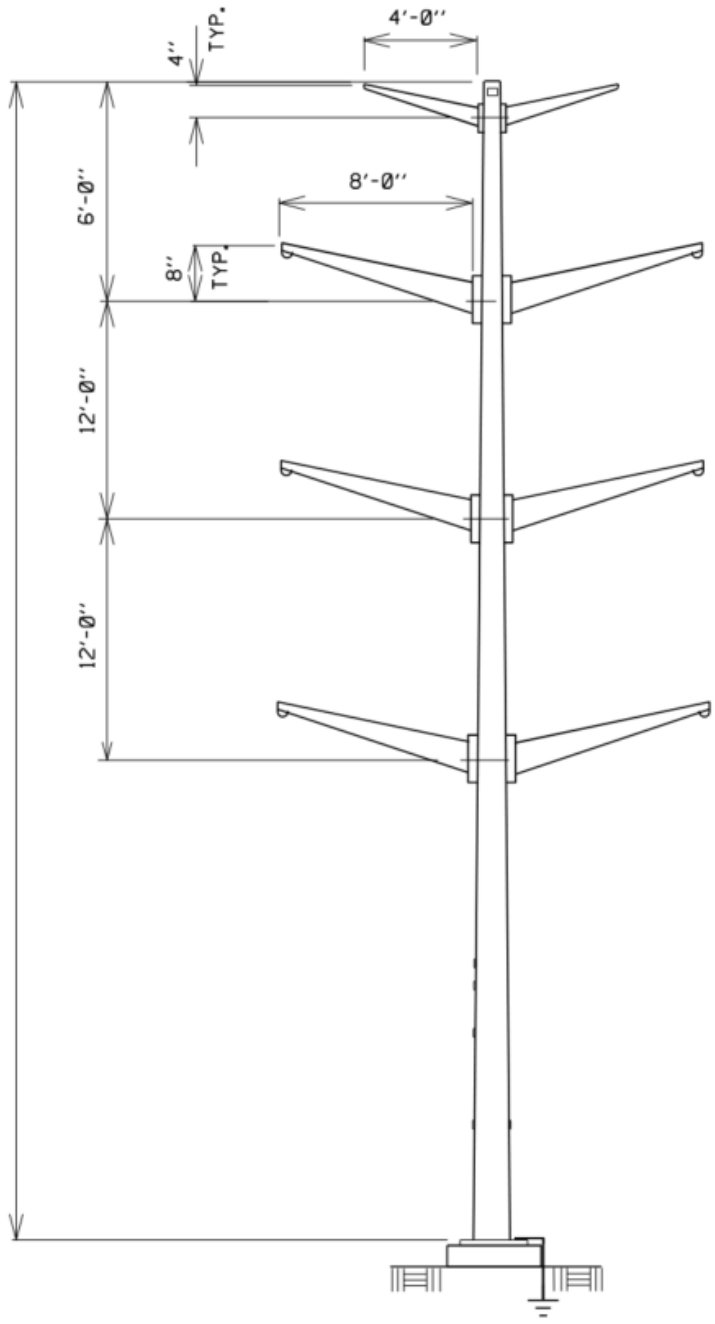


Figure 5 – Proposed Double Circuit Double Deadend Structure Configuration



Required Material Summary

Item	Qty
Engineered Structures	88
12,000-FT OPGW Reels	8
12,000-Ft Conductor Reels	12