

**Article VII Application**  
**Canisteo Wind Transmission Facility**  
**Case No. 19-T-\_\_**

**Exhibit 5**  
**Project Design Drawings**

**Invenergy**

## **EXHIBIT 5 – DESIGN DRAWINGS**

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## **EXHIBIT 5 PROJECT DESIGN DRAWINGS**

This Exhibit addresses the requirements of 16 NYCRR § 86.6.

### **5.1 General Description of the Proposed Transmission Line**

Canisteo Wind Energy LLC ("The Applicant") proposes to construct approximately 14.6 miles of 115-kV transmission line to transmit power from the 290.7 MW Canisteo Wind Farm located in Steuben County, New York that has been submitted for permitting under Siting Board Case No. 16-F-0205. The line will run from the Applicant's proposed Collection Substation (see Figure 5-1) to a proposed POI Switchyard located at the NYSEG Bennett Substation as shown in Figure 5-2 and Figure 5-3. The POI Switchyard will be constructed by the Applicant, but once commissioned, ownership will be turned over to NYSEG. Final POI Switchyard design is pending the Facilities Study (Q#519) in accordance with Attachment X of the NYISO Open Access Transmission Tariff which is underway with anticipated completion in Q1 2019. Maps showing the proposed transmission line are presented in Exhibit 2 as Figures 2-1 through 2-3.

A single circuit 115 kV transmission line will be developed on new ROW along the entire route. Land along the proposed route has been secured via easement agreements with participating landowners. Topography of the proposed ROW is described in Exhibit 4 and detailed in Figure 5-4. The structures and line construction will meet NESC standards of safety while causing minimum intrusion on the natural landscape.

### **5.2 Structure Types and Description**

The transmission line requires the installation of steel monopoles, wood H-frame structures, and wood 3-pole structures at 106 locations along the proposed route. Forty-three structures are steel monopoles, and sixty-three structures are either wood H-frame or 3-pole design. Steel poles are galvanized steel with a metallic silver finish, wood structures are typically Douglas fir or pine that has been treated to improve weathering resilience. Proposed structure heights vary from 47.5 ft. to 115. ft above grade. Structure height varies due to topography, structure type, and required span. Steel monopoles vary from 60 ft. to 101.5 ft. in height, while the wood structures range from 47.5 ft. to 115 ft. in height. H-frame and 3-pole structures are used to provide greater span length, reduced conductor uplift or insulator swing, and better ground clearance relative to pole height from ground. Additionally, there are several utility crossings between structures 47 and 54 that are better accomplished using a horizontal conductor configuration allowed by H-frame and 3-pole structures. Heights by pole location are tabulated and provided in Appendix 5a.

The average span between transmission line structures is 724 feet. The maximum span of 1146 ft. is between structures 55 and 56. The minimum span of 150 ft. is between the POI Switchyard deadend and structure 2.

Structure widths vary by type. Structural drawings for each pole type and conductor arrangement including dimensions are provided in Figure 5-5.

### **5.3 Power Conductor Description**

The proposed transmission line conductors are 1272 kcmil 45/7 aluminum conductor steel reinforced (ACSR) "Bittern" type wire. This wire is composed of a stranded central steel core surrounded by stranded aluminum alloy conductors which are protected from corrosion with a non-specular zinc coating.

## **5.4 Structure Locations**

Each structure will be placed to cause minimum reasonable disturbance to the environment, both in the course of construction, and as a permanent fixture on the landscape, within the scope of optimum design structure and utilization. Typical spans between structures range from 150 to 1146 feet with an average span of 724 feet. Actual spans will vary to accommodate geographical, archaeological, and environmental considerations. See Appendix 5a for proposed structure locations by latitude and longitude; locations may also be referenced in Figure 5-4 along with the ROW centerline and vertical scale.

## **5.5 Right-of-Way Width**

The proposed transmission line will be placed in the center of a new 80-foot to 100-foot-wide ROW. Steel monopole structures have an 80-foot ROW and the wooden H-frame or 3-pole structures have a 100-foot ROW.

## **5.6 List of Drawings**

This exhibit contains the following preliminary design drawings of the transmission line, and POI Switchyard and Collection Substation sites:

- Figure 5-1 – Collection Substation Drawings (One-Line & Elevation)
- Figure 5-2 – POI Switchyard One-Line Drawing
- Figure 5-3 – POI Switchyard Aerial
- Figure 5-4 – CAN-T004, Plan & Profile
- Figure 5-5 – CAN-B-T003-1 through CAN-B-T003-20, Structures and details

As previously noted, Transmission Facility location maps are included as Figures 2-1, 2-2, and 2-3.