Submission of Indicated New York Transmission Owners
For Authority to Construct and Operate Electric Transmission Facilities in Multiple Counties in New York

Case 13-M-0457

Exhibit E-1
Description of Proposed Transmission Facilities

Oakdale to Fraser 345 kV Transmission Line
and
Edic to New Scotland
345 kV Transmission Line
and
Knickerbocker to Pleasant Valley
345 kV Transmission Line Project
(O-F/ED-PV)

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OAKDALE TO FRASER 345 KV TRANSMISSION LINE
AND EDIC TO NEW SCOTLAND 345 KV TRANSMISSION LINE
AND KNICKERBOCKER TO PLEASANT VALLEY
345 KV TRANSMISSION LINE PROJECT
(O-F/ED-PV)

EXHIBIT E-1: DESCRIPTION OF PROPOSED TRANSMISSION FACILITIES

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EXHIBIT E-1: DESCRIPTION OF PROPOSED TRANSMISSION FACILITIES

E-1.1 Description of Proposed Transmission Facilities

E-1.1.1 Edic to Princetown Junction

The ED-PT Junction portion of the segment starts at the existing 345 kV Edic Substation in the Town of Marcy, Oneida County. The scope of work consists of the removal of two existing 230 kV lines and the construction of a new 345 kV line within approximately 66.8 miles of existing ROW. For approximately 12.6 miles out of Edic Substation, this will involve the removal of one set of 230 kV wires and insulators from each of the two existing 230/345 kV double-circuit monopole structures and the installation of one set of 345 kV wires and insulators to one of them. For the remaining approximately 54.2 miles, the two existing 230 kV H-frame structure lines will be removed and replaced with one new 345 kV line consisting predominately of H-frame structures. New 345 kV tubular steel monopole structures will be used intermittently through this segment for approximately 5.4 miles in total. This segment terminates at Princetown Junction in the Town of Princetown, Schenectady County. The ED-PT segment passes through the Towns of Marcy and Deerfield in Oneida County, the Towns of Schuyler, Frankfort, German Flatts, Little Falls, Stark, and Danube in Herkimer County, the Towns of Minden, Canajoharie, Root, Glen, Charleston, and Florida, in Montgomery County, and the Towns of Duanesburg and Princetown in Schenectady County.

E-1.1.2 Princetown Junction to New Scotland

The PT-NS segment starts at Princetown Junction. The scope of work consists of the construction of a new 345 kV line within approximately 19.7 miles of the existing ROW. This segment will utilize approximately 11.5 miles of H-frame structures, 6.3 miles of monopole structures and 1.9 miles of 115/345 kV double-circuit monopole structures. This segment terminates at the existing 345 kV New Scotland Substation in the Town of New Scotland, Albany County. The PT-NS segment passes through the Town of Princetown in Schenectady County, and the Towns of Guilderland and New Scotland, in Albany County.

E-1.1.3 Princetown Junction to Rotterdam

The PT-RD portion of the segment also starts at the Princetown Junction. The scope of work consists of the removal of two existing 230 kV H-frame structure lines and the construction of two new 345 kV compact monopole structure lines within approximately 5.0 miles of existing ROW. This segment

terminates at the rebuilt and expanded 345 kV Rotterdam Substation in the Town of Rotterdam, Schenectady County.

E-1.1.4 Knickerbocker to Churchtown

The KB-CT segment starts at the new 345 kV Knickerbocker Switching Station in the Town of Schodack, Rensselaer County. This scope of work includes the removal of one existing double-circuit 115 kV lattice structure and construction of a new monopole double-circuit 115/345 kV line within approximately 21.9 miles of existing ROW. This segment terminates at the rebuilt and expanded 115 kV Churchtown Switching Station in the Town of Claverack, Columbia County. The existing NYSEG 115 kV Churchtown Switching Station in the Town of Claverack, Columbia County will be rebuilt and expanded to provide termination locations for five 115 kV lines. This expansion requires an extension of the existing Churchtown Switching Station fenceline. The KB-CT segment passes through the Town of Schodack in Rensselaer County, and the Towns of Stuyvesant, Stockport, Ghent, and Claverack, in Columbia County.

E-1.1.5 Churchtown to Pleasant Valley

The CT-PV segment starts at the rebuilt and expanded Churchtown Switching Station. The scope of work consists of the removal of two existing 115 kV double-circuit lattice structures, and the construction of a new 115/345 kV double-circuit monopole structure line within approximately 32.3 miles of existing ROW. This segment terminates at the existing Consolidated Edison 345 kV Pleasant Valley Substation in the Town of Pleasant Valley, Dutchess County. All work at the Pleasant Valley Substation will be within the existing fenceline. The CT-PV segment passes through the Towns of Claverack, Livingston, Gallatin, and Clermont in Columbia County, and the Towns of Milan, Clinton, and Pleasant Valley in Dutchess County.

E-1.1.6 Oakdale to Fraser 345 kV Transmission Line

The O-F component of the O-F/ED-PV Project consists of the construction of a new 345 kV line of approximately 57.7 miles built parallel to the existing 345 kV NYSEG Line #32. The new transmission line will be constructed in locations on the existing NYSEG right-of-way. The new line will run through the Counties of Broome, Chenango, and Delaware.

E-1.2 Design Voltage, Conductor, and Insulators

Table E-1-1 below summarizes the design voltages, operating voltages, and conductor types for each

segment of the ED-NS/KB-PV components of the Project.

Table E-1-1: ED-NS/KB-PV Design Voltage and Conductor

Project / Line	Design Voltage (kV)	Operating Voltage (kV)	Proposed Conductor
Edic-New Scotland			
#53 Edic-New Scotland	345	345	2 - 954 kcmil 54/7 "Cardinal" ACSS
#14A Edic-Rotterdam	345	345	2 - 954 kcmil 54/7 "Cardinal" ACSS
#14B Rotterdam-New Scotland	345	345	2 - 954 kcmil 54/7 "Cardinal" ACSS
#13 Rotterdam-New Scotland	115	115	954 kcmil 54/7 "Cardinal" ACSS
Knickerbocker-Pleasant Valley			
#96 Knickerbocker-Pleasant Valley	345	345	2 - 954 kcmil 54/7 "Cardinal" ACSS
#14 Schodack-Valkin	115	115	954 kcmil 54/7 "Cardinal" ACSS
#15 Valkin-Hudson	115	115	954 kcmil 54/7 "Cardinal" ACSS
#12 Hudson-Churchtown	115	115	954 kcmil 54/7 "Cardinal" ACSS
#4 Churchtown-Blue Stores	115	115	954 kcmil 54/7 "Cardinal" ACSS
#T7 Blue Stores-Milan	115	115	954 kcmil 54/7 "Cardinal" ACSS
#10 Milan-Pleasant Valley	115	115	954 kcmil 54/7 "Cardinal" ACSS

Insulators for all the new transmission lines will typically be suspension-type ball-and-socket ceramic insulators in “I” or “V” configuration. Insulator color will match the finish of the new structures to the greatest extent possible. Grey insulators will be used with galvanized steel structures and brown insulators will be used with weathered steel or wood structures.

The O-F component of the Project will be designed to meet or exceed all requirements for electrical clearances and mechanical strength for Grade B Construction set forth in the American National Standard, National Electrical Safety Code (ANSI C2, 2012 edition), as in effect at the time of design (hereafter referred to as “NESC”). Conductor-to-ground electrical clearances at short-time emergency (STE) New York Power Pool ratings used in the design of the O-F component will also meet or exceed

those recommended in the NESC.

LENGTH OF 345-kV TRANSMISSION LINE TO BE CONSTRUCTED	57.7 miles
TYPE OF CONSTRUCTION	
Self-Supporting Galvanized Steel Poles, Single-Circuit:	57.7 miles
DESIGN VOLTAGE	345 kV
OPERATING VOLTAGE	345 kV
INITIAL OPERATING VOLTAGE	345 kV
CONDUCTOR	
Type, Material, and Size:	Aluminum conductor, steel reinforced ACSR 1590 kcmil 54/19 "Falcon"
Quantity:	3 per circuit, 1 per phase
Overall Diameter:	1.545 inches
Cross Sectional Area:	1.875 square inches
Rated Strength:	54,500 pounds
STATIC WIRE	
Type, Material:	OPGW S-4-61/61/583 (Spec DNO-8155)
Diameter:	0.583 inches
Quantity:	1 per circuit
Rated Strength:	20,900 pounds
Type, Material:	Alumoweld 7#7
Diameter:	0.433 inches
Quantity:	1 per circuit
Rated Strength:	19,060 pounds
INSULATORS	
Types/Design:	Porcelain suspension and polymer line post
Color:	Grey
STRUCTURES – GALVANIZED STEEL POLES, SINGLE-CIRCUIT	
Type:	Steel monopole
Material:	Structural steel bolted & welded angles and plates
Typical Height above Ground:	105'-0" feet
Preservative Cover:	Galvanized
Color:	Grey

E-1.3 Design References

The design of the Oakdale to Fraser component of the Project will be in accordance with all applicable

federal, state, and local codes and industry standards, unless stated otherwise. The industry codes and standards shall include, but shall not be limited to, the following:

- AISC Manual of Steel Construction
- ANSI/ASME B18.1.1-1972 (R2001) Small Solid Rivets (7/16 Inch Nominal Diameter and Smaller)
- ANSI C2, The National Electric Safety Code 2012 (NESC)
- ANSI/ASME B18.2-1-1996 Square and Hex bolts and screw inch Series
- ASTM A36/A36M Standard Specification for Carbon Structural Steel
- ASTM A475 Standard Spec for Zinc Coated Steel Wire Strand
- ASTM A572/572M Standard Spec for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- ASTM E376 Standard Practice for Measuring Coating Thickness by magnetic-field or electromagnetic Test Methods
- ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength [Metric]
- A354 Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
- A490 Specification for Heat-Treated, Structural Bolts, 150 ksi (1035 MPa) Tensile Strength
- ASCE 74, Guidelines for Electrical Transmission Lines Structural Loads
- A588 High Strength Low-Alloy Structural Steel Up to 50 ksi [345 MPa] Minimum Yield Point
- A871 Standard Specification for High Strength Low Alloy Structural Steel Plates with Atmospheric Corrosion Resistance
- A633 Standard Specification for Normalized Strength Low Alloy Structural Steel Plates
- A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- American Society of Civil Engineers ASCE-48 Design of Steel Transmission Pole Structures
- AWS American Welding Society D1.1 Structural Welding Code Steel
- ACI American Concrete Institute
- Bulletin 1724E-214 Guide Specification for Standard Class Steel Transmission Poles
- Iberdrola Electrical Design Manual

- Iberdrola Structural Design Criteria
- Iberdrola USA Transmission Standards Manual

E-1.4 Foundation Details

For the O-F component of the Project, pole foundations will be drilled-in, reinforced concrete, piers (caisson) or embedded. Each foundation will be custom designed, using computer programs, based on critical foundation loading cases from the pole supplier and soil/rock condition data from geotechnical investigations. Caissons will be either installed entirely into suitable soil strata or partially embedded into competent rock, as shown in Figure E-1-1.

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Exhibit E-1

Figure E-1-1

[Submitted under separate cover to the ALJs for confidential treatment because it contains critical infrastructure information.]

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