



South Ripley
SOLAR PROJECT

ConnectGen Chautauqua County LLC

South Ripley Solar Project
Matter No. 21-00750

900-2.6 Exhibit 5

Design Drawings

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EXHIBIT 5 DESIGN DRAWINGS

(a) Site Drawings

The Site Plan Drawings for this Facility (Appendix 5-A) and other supporting drawings were prepared at a common legible engineering scale ratio of at least 1:200 by Mott MacDonald (Mott) under the direction of a professional engineer, licensed and registered in New York State. Two (2) full-size hard copy sets of 22" x 34" sheets are provided for all drawings with this application. These drawings are labeled "Conceptual, Not for Construction."

(b) Setback Requirements for Wind Turbine Towers

The proposed Facility is not a wind energy generating facility, and therefore the requirements of §900-2.6(b) are not applicable and will not be addressed in this Application.

(c) Power, Hub Height, Rotor Diameter, Total Height of Turbines

The proposed Facility is not a wind energy generating facility, and therefore the requirements of §900-2.6(c) are not applicable and will not be addressed in this Application.

(d) Setback Requirements for Solar Facility Components

The Facility Layout (see Figure 3-1) has been designed to meet or exceed the setback requirements outlined in §900-2.6(d) and summarized by the following:

- 250 feet from non-participating occupied residences
- 250 feet from participating occupied residences
- 100 feet from non-participating residential property lines (tax parcels with a residential structure)
- 50 feet from non-participating non-residential property lines (tax parcels without a residential structure)
- 50 feet from the centerline of public roads

Where applicable, the Applicant will site PV panels at minimum setback distances from various existing utilities. Adherence to these setbacks will ensure interference between Facility components and existing utilities is avoided. The setbacks used in the preparation of the design drawings (see Appendix 5-A) in relation to relevant utility infrastructure Right-of-Way (ROW) include 25-foot minimum setbacks from existing overhead electrical distribution lines and 100-foot minimum setback from existing overhead transmission lines. All setback distances are defined in Exhibit 5(f)(1) below.

As of the time of this Application, setback requirements for solar energy systems in the Town of Ripley are governed by the Town of Ripley Zoning Law¹, as described below. The Town of Ripley has proposed amendments to the Zoning Law regarding solar energy systems, but these amendments have not yet been finalized and adopted and are therefore not addressed in this section. Please see Exhibit 24 for a comprehensive discussion addressing the existing and proposed zoning regulations and waivers sought through the 94-c process.

Solar setback requirements are governed by two provisions in the Town of Ripley Zoning Law:

- Section 620 (A) – Solar and Wind Systems, Solar or Wind Permit and Placement: *Consideration will be given to locating the solar or wind structure the furthest distance from adjoining properties, on the southern or windward exposure, which is reasonably possible. This distance shall be a minimum of 100 feet and may be required to be more if the slope so dictates and as dictated by NYSERDA regulations. NYS Consolidated permitting procedure and application will be followed.*

As discussed in Exhibit 24, the Applicant is seeking a waiver for this provision. The requirements of Section 620(6)(A) of the Town of Ripley Zoning Law could potentially be replaced by the Proposed Solar Energy Zoning Law and compliance with this provision will, therefore become unnecessary. However, given the Proposed Solar Energy Zoning Law has not been enacted by the Application filing date, the Applicant has requested that the Office elect not to apply this provision. As explained in Exhibit 24, the Section 620 (A) is overly vague and is contrary to Section 620(5)(B)(2) of the Town of Ripley Zoning Law which requires that Ground-Mounted Solar Energy Systems shall adhere to the height and setback requirements of the underlying zoning district. The Facility does partially comply with Section 620 (A) with 100 feet setbacks from property lines applied to solar panels in relation to non-participating residential (tax parcels with occupied residences) property boundaries. With respect to Section 620(5)(B)(2), PV arrays within the proposed Facility are all sited on tax parcels zoned Rural/Agricultural (RURA), thus underlying setbacks for non-residential (primary use) are 50 ft from the front, side, and rear yards as seen in Appendix B of the Town of Ripley Zoning Law. The Facility has been designed to comply with these requirements.

(e) Maximum Height of Solar Facility Components

The solar facilities (i.e., PV arrays, inverters, and transformers) would have a height of approximately 13 feet above ground level at their highest point.

¹ Available at: <https://www.ripleyny.org/buildingzoning.html>

(f) Site Plans and Drawings

(1) Site Plans

The Site Plan Drawings and other supporting drawings are presented at a common engineering scale of at least of 1:200 and are organized as follows:

Appendix 5-A: Civil Design Drawings

Appendix 5-B: Electrical Design Drawings

Appendix 5-C: Collection System Design Drawings

Appendix 5-D: High Voltage Substation Drawings

Civil Design Drawings (Appendix 5-A) include the typical civil design details, existing conditions and disturbance plan, grading and erosion plan, and the access roads plans and profiles. The Civil Design Drawings include a site layout plan for all Facility components, site boundaries and adjoining properties,² applicable setbacks, limits of construction disturbance, approximate clearing limits, delineated wetlands and streams,³ proposed grading, access roads and turn-around areas and construction design details, including plans and profiles for access roads, erosion and sediment control details, culvert details, and berms, retaining walls, and other landscaping improvement details.

Electrical design details are captured in three separate drawing sets: Electric Design Drawings (Appendix 5-B), Collection System Design Drawings (Appendix 5-C), and High Voltage Substation Drawings (Appendix 5-D). The Electric Design Drawings (Appendix 5-B) provide plans and details specific to the PV arrays and the BESS, including an overall site plan with PV arrays and collection line system routing, DC collection one-line, PV panel racking, inverters/transformers, grounding techniques, communication details, equipment specifications, trench details, and BESS arrangement and lighting. Collection System Design Drawings (Appendix 5-C) provide plans and details specific to the collection system, including collection system plans and profiles, AC single line, cable trenching and crossing details, collection equipment specifications, and overhead line typical design details. High Voltage Substation Drawings (Appendix 5-D) provide plans and details specific to the High Voltage system design, include the collection substation design, the point of interconnection (POI) expansion, control house, and the collection substation and POI lighting plans.

Collectively, the civil and electrical drawings include the following features in Table 5-1:

² Additional information regarding parcel boundaries is provided in Exhibit 4 of this Application.

³ Additional information regarding delineated wetlands and streams is provided in Exhibits 13 and 14 of this Application.

Table 5-1. Site Plan Details

Site Plan Details (per §900-2.6(f)(1))	Drawing Set(s)
(a) Solar panels, inverters, low-medium transformers, property lines, and applicable setbacks	Appendix 5-A, Appendix 5-B
(b) Extents of proposed access roads and any turn-around areas (for construction and operation)	Appendix 5-A
(c) Electric cable collection line corridors (including permanent rights-of-way (ROW)), approximate locations of any proposed splice vaults ⁴ , overhead and underground cable routes, locations of proposed trenchless collection line installations, lengths of electric line routes	Appendix 5-A, Appendix 5-B, Appendix 5-C, Figure 10-2
(d) The existing electric transmission line (which the Facility will interconnect to) and any known existing utilities (including pipelines) and associated rights of way within the facility site;	Appendix 5-A, Figure 3-4
(e) Approximate limits of disturbance for all Facility components	Appendix 5-A, Figure 3-11
(f) Approximate clearing limits for all Facility components	Appendix 5-A
(g) Extents of collection and interconnection stations and any applicable local setbacks	Appendix 5-D
(h) Energy storage system and any applicable setbacks	Appendix 5-B
(i) Site security features, including approximate location of perimeter fencing	Appendix 5-A
(j) Fences and other landscaping improvements including planting modules	Appendix 5-A

(2) Typical Design Detail Drawings and Plans

The Design Drawings and other supporting drawings, detailed in Table 5-2, contain typical design details of all Facility components, including fencing, lighting, gates, buildings, and structures. Typical dimensions including length, width, height, and structures and fixed equipment are also depicted for all Facility components. Elevation drawings include elevation mark pointers with a reference to associated elevation views, as applicable.

⁴ Approximate locations of proposed splice vaults in the Facility Site are consistent with labeled Bore Pit locations in Appendix 5-A. These locations may be updated during detailed pre-construction design.

Table 5-2. Typical Detail Drawings

Site Plan Details (per §900-2.6(f)(2))	Drawing Set(s)
(i)(b) Typical elevation drawings indicating the length, width, and height of all buildings, structures, and fixed equipment within POI switchyard station (including fencing, gates, and all station equipment) with a general arrangement plan showing elevation mark pointers with reference to associated elevation views (including views of all components of the station)	Appendix 5-D
(i)(c) Typical elevation drawings indicating the length, width, and height of all buildings, structures, and fixed equipment within the collection substation (including fencing, gates, and all substation equipment) with a general arrangement plan showing elevation mark pointers with reference to associated elevation views (including views of all components of the substation)	Appendix 5-D
(i)(d) Typical elevation drawings indicating the length, width, and height of all structures and fixed equipment within the BESS (including fencing, gates, and equipment)	Appendix 5-B
(ii) All proposed Access Roads with typical installation plan views, cross section, side view, and identification of materials to be used along with corresponding material thickness	Appendix 5-A
(iii) Typical underground infrastructure section details including single and multiple circuit layouts with dimensions of proposed depth, trench width, level of cover, separation requirements between circuits, clearing width limits for construction and operation of the facility, limits of disturbance, required permanent ROW and a description of the cable installation process, typical details of any proposed splice vaults including vault dimensions, level of cover, required trench length, width and depth, clearing width limits for construction and operation of the facility, and limits of disturbance	Appendix 5-B, Appendix 5-C
(iv) Details for typical overhead electric transmission and collection lines, including a profile of the centerlines at an exaggerated vertical scale and typical elevation plans including height above grade and structure layouts	Appendix 5-C

(3) Site Suitability Reports for Turbine Models

The proposed Facility is not a wind energy generating facility, and therefore the requirements of §900-2.6(c) are not applicable and will not be addressed in this Application.

(4) Engineering Codes, Standards, Guidelines, and Practices

The list of codes and standards that have been, and will continue to be considered during the design, construction, operation, and maintenance of this Facility is extensive. The following is provided as a representative list of applicable codes and standards, including those applicable to the energy storage facility. This list will be updated following Certification, during final design.

- The Aluminum Association (AA)
- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI)

- American Institute of Steel Construction (AISC)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- American Society for Testing and Materials (ASTM)
- American Welding Society (AWS)
- Concrete Reinforcing Steel Institute (CRSI)
- Edison Electric Institute Publications (EEI-AEIC)
- Federal Energy Regulatory Commission (FERC)
- Insulated Cable Engineers Association (ICEA)
- International Electro-technical Commission (IEC)
- Institute of Electrical and Electronics Engineers (IEEE)
- Mine Safety and Health Administration (MSHA)
- National Bureau of Standards (NBS)
- National Electrical Manufacturers Association (NEMA)
- National Electric Code (NEC)
- National Electric Safety Code (NESC)
- National Electrical Testing Association (NETA)
- National Fire Protection Association (NFPA)
- National Institute of Standards and Technology (NIST)
- National Ready Mixed Concrete Association (NRMCA)
- New York State 2019 Energy Storage System Supplement to the New York State Uniform Prevention and Building Code
- Occupational Safety and Health Administration (OSHA)
- Portland Cement Association (PCA)
- Rural Electrification Administration (REA)
- Society of Automotive Engineers (SAE)
- Society for Protective Coatings (SSPC)
- Uniform Building Code (UBC)
- Underwriter's Laboratories, Inc. (UL)

The Applicant has coordinated with local fire departments during the pre-Application phase to communicate details regarding the Facility, including the energy storage facility, answer questions, and incorporate feedback from stakeholders.

- In April 2020, the Applicant requested a virtual consultation with the Ripley Volunteer Fire Chief, who requested the consultation be held in person.
- In May 2020, the Applicant corresponded with the Ripley Volunteer Fire Chief via email regarding preliminary information regarding the Facility.
- In May 2020, the Applicant held an energy storage safety webinar for local and county first responders which provided detail on energy storage systems, safety equipment and protocols, and emergency response procedures in relation to energy storage systems. A third-party energy storage systems expert were available during the meeting to speak about energy storage and answer questions. As a follow up from that meeting, the Applicant provided copies of relevant New York State Building and Fire Codes, NFPA codes and standards, and IFC standards to the Ripley Volunteer Fire Chief.
- In June 2020, the Applicant met with the Director of the Chautauqua County Office of Emergency Services to discuss the Facility and provide information regarding the proposed energy storage facility.
- The Applicant requested an in-person consultation with the Ripley Volunteer Fire Chief in June 2020 per the Chief's request in April 2020, but the Ripley Volunteer Fire Chief requested time to meet with an attorney hired utilizing Article 10 PSS intervenor funds before meeting with the Applicant.
- In September 2020, the Applicant met in person with members of the Crescent Hose North East Fire Department and the Ripley Volunteer Fire Department to provide details regarding the Facility.
- In April 2021, the Applicant provided drafts of the Safety Response Plan, Site Security Plan, and Emergency Haul Routes to officials of the Town of Ripley, its counsel and associated consultants at the 94-c Pre-Application Municipal Consultation meeting.
- In May 2021, the Applicant emailed notice of battery energy storage webinars, including fire response for BESS, being provided by the New York State Energy Research and Development Authority (NYSERDA) to the Ripley Volunteer Fire Chief, Crescent Hose Company Fire Chief, and the Chautauqua County Fire Coordinator.
- In May 2021, the Applicant held an in-person consultation with members of the Chautauqua County Office of Emergency Services and an third-party energy storage systems expert regarding updated Facility layout and design information and provided copies of the preliminary Facility Site layout, Emergency Access Routes, Site Security Plan (Appendix 6-A), and Safety Response Plan (Appendix 6-B).
- In June 2021, the Applicant held a meeting with members of the Ripley Volunteer Fire Department and the Chautauqua County Office of Emergency Services to discuss the proposed Facility and answer questions about battery energy storage systems. Prior to this meeting, the Applicant

provided draft copies of the Site Security Plan (Appendix 6-A), Safety Response Plan (Appendix 6-B), and Figure 16-3 of the Application (Emergency Routes). At the meeting, the Applicant received both written and verbal feedback on the Safety Response Plan and Emergency Access Routes which was incorporated into the final versions of Appendix 6-B and Figure 16-3.

The Applicant will continue to coordinate with local stakeholders regarding energy storage as the design of the Facility continues to progress.

(5) Manufacturer Design, Safety and Testing Information of Equipment

Technical and safety manuals provided by the manufacturers are included in Appendix 5-E for solar panels, inverters, substations, transformers, battery storage equipment, and any other related Facility equipment in accordance with §900-2.6(f)(5).