



Exhibit 5: Design Drawings

Cider Solar Farm
Towns of Oakfield and Elba
Genesee County, New York

Matter No. 21-01108

EXHIBIT 5: DESIGN DRAWINGS

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Abbreviations

NYCRR	New York Codes, Rules, and Regulations
NYPA	New York Power Authority
NYS	New York State

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Glossary of Terms

Applicant	Hecate Energy Cider Solar LLC
Project	Refers to the proposed Cider Solar Farm, an up to 500-megawatt utility scale solar project that will be comprised of photovoltaic panels, inverters, access driveways, electrical collection lines, point of interconnection/substation, construction staging areas, fencing and plantings, located on private land in the towns of Elba and Oakfield, Genesee County, New York.
Project Area	Refers to the Project Site and surrounding/adjacent land totaling approximately 7,518 acres.
Project Footprint	Refers to the limit of temporary and permanent disturbance within the Project Site caused by the construction and operation of all components of the Project totaling approximately 2,452 acres.
Project Site	Refers to those privately owned parcels under option to lease, purchase, easement or other real property interests with the Applicant in which all Project components will be sited totaling approximately 4,650 acres.

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The content of Exhibit 5 is provided in conformance with Chapter XVIII, Title 19 of the New York Codes, Rules, and Regulations (NYCRR) § 900-2.6, as follows.

a) Design Drawing Preparer

The *Civil Design Drawings* (Appendix 5-A of this Application) for the Cider Solar Farm (the Project) were prepared by Stantec Consulting Services Inc., using computer-aided design software (i.e., AutoCAD) under the direction of a professional engineer who is licensed and registered in New York State (NYS).

b) Wind Energy Facility Setbacks

The requirements of this section do not apply to the Project.

c) Turbine Model

The requirements of this section do not apply to the Project.

d) Solar Energy Facility Setbacks

The Project will comply with setback requirements set forth in the following table in accordance with 19 NYCRR § 900-2.6(d) as shown in Table 5-1: *Setback Requirements for Solar Project Components* and setback requirements of the Town of Elba. The Town of Oakfield Zoning Ordinance does not contain setback requirements applicable to the Project. While the Applicant maintains that the Town of Oakfield Solar Ordinance is ineffective, and such understanding has been confirmed during consultation with members of the Town Board and the Town Clerk, as described in Exhibit 24, the Project nevertheless complies with the setback requirements therein, which includes minimum side and rear yard setbacks of 25 feet, a minimum front yard setback of 50 feet, and a minimum setback from inhabited structures on adjacent lots of 50 feet.³ Setbacks from property lines, residences and road rights of way are shown in the *Civil Design Drawings*, which constitutes the Site Plan for the Project, as required by 19 NYCRR § 900-2.6(f)(1)(i). Any Project fencing, collection lines, access roads, and landscaping would occur within the setback, as illustrated in the *Civil Design Drawings*.

Table 5-1: Setback Requirements for Solar Project Components

Setback Type	Solar Project Setback	Town of Elba ²
Non-participating residential property lines	100 feet*	100 feet
Centerline of Public Roads ¹	50 feet	None
Right of Way of NYS Roads	100 feet	100 feet
Right of Way of Town and County Roads	70 feet	70 feet
Non-participating property lines (non-residential) ¹	50 feet	50 feet
Non-participating occupied residences ¹	250 feet	50 feet

¹ Setback required pursuant to 19 NYCRR § 900-2.6(d), Table 2.

² Setback required by the Town of Elba Local Law No 1 of 2021.

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³ The applicant maintains that the Solar Ordinance is ineffective. To the extent the Solar Ordinance is deemed effective or the Town of Oakfield subsequently adopts it in a manner and at a time that would make it applicable to the Project, the Project meets the substantive requirements of the Solar Ordinance described herein.

e) Solar Energy Facility Maximum Height

The maximum height of the Project, exclusive of electric collection, transmission or substation/switchyard components, will not exceed 15 feet from finished grade.

f) Design Drawings

1) Site Plans

The *Civil Design Drawings* constitute the proposed detailed Site Plan for the Project. The *Civil Design Drawings* have been prepared at 1:200 feet, as indicated on the drawings. Preceding the *Civil Design Drawings* is an overall plan that depicts the entire Project Site and provides a key to the *Civil Design Drawings* (Sheets G1001 and G1002). The *Civil Design Drawings* set includes 62 sheets and is presented in three (3) sections, *Site and Landscape Plans (GI 002, CS401 – CS423, and L500 to 510)*, *Grading and Erosion Control Plans (CG100, CG401 to CG422, C500-503)* and *Electrical Plan Set (Substation and Switchyard, Electrical Collection and, Gen-Tie (E-drawings))*. The *Civil Design Drawings* depict all Project components and features, including the following:

- Property lines, property tax parcel and ownership information, applicable setbacks, easements and rights-of-way;
- Solar panels and associated mounting features, and inverters including approximate number of panels and a general detail for the proposed solar panel arrangements; inverters; transformers; property lines; and the applicable setbacks set forth in Table 5-1 and as described in Exhibit 24: *Local Laws* of this Application;
- Proposed location of Project gravel access roads, including turnarounds;
- Buried electric cable collection lines and number of circuits per proposed electric cable route, Existing utility equipment locations and easement limits of those existing locations, including natural gas pipelines, electric transmission and distribution lines, cables and telecommunication lines, and other features as applicable;
- Approximate limits of disturbance for all temporary and permanent Project components (panels, inverters, access roads, buried electric collection lines, temporary laydown yards, substation, etc.) (Project Footprint);
- Clearing limits, including tree clearing, for all Project components (panels, access roads, buildings, electric lines, shading vegetation, etc.);
- Outline of collection and interconnection switchyard/substation, including access driveways, setbacks, and fence lines;
- Locations of planned temporary construction laydown yards;

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- Any security features, including perimeter fencing. Closed-circuit television or similar monitoring equipment is not proposed;
- Fencing and gates, including clearing associated with fencing and proposed design (i.e., height, material); and
- Landscaping improvements, including seeding areas, and proposed landscape plantings serving as screening. A detailed planting schedule and proposed seed mixes are included in *Civil Design Drawings*.

No battery energy storage systems are proposed.

The *Civil Design Drawings* comprised of a coversheet and index pages with notes *Site and Landscape Plans, Grading and Erosion Control Plans and Electrical Plans*, are additionally described below.

Site and Landscape Plans (Sheets GI 002, CS401 – CS423, and L500 to 510)

Landscaping and screening/planting plans have been developed for the Project, as shown in the *Civil Design Drawings*. The Project Site includes a number of forestland and forested hedgerows, as well as landscape trees, that will be retained and act as screening to neighboring properties. As shown in the landscaping plans there is visual screening included at areas adjacent to existing homes and along transportation corridors. Areas of forestland and trees will be removed to accommodate solar equipment and to limit shading on panel areas. In select locations where existing native vegetation will not screen the Project, vegetative buffers are proposed to be planted. Screening is accomplished using 2 levels of planting, described as Module A which is a dense screen and Module B which is intermittent and utilized to soften the views. Additional description of the visual mitigation through site plantings is provided in Exhibit 8. The Site and Landscape Plans also provide for details relative to planting materials and seed mixes to be used in panel and surrounding locations.

The Project will be enclosed with a 7-foot-tall chain link fence, as shown in *Civil Design Drawings*. The substation and switchyard and associated access roads are separately fenced to allow New York Power Authority (NYPA) to access the switchyard equipment. Access gates will be located at the entrance to the substation and the switchyard which are located off of the new access roads that will be located off of Graham Road. There will be two gates one to enter the substation and a separate gate and access road to enter the switchyard.

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Grading and Erosion Control Plans (CG100, CG401 to CG422, C500-503)

A topographic and boundary survey was conducted by a licensed surveyor on the Project Site in 2020 compiled from 2019 United States Geological Survey/Federal Emergency Management Agency LIDAR data with break lines added and field verification to confirm data quality to create a digital terrain model and 2-foot interval contours. Existing and proposed contours (2-foot intervals) are depicted on the plan view sheets of the *Civil Design Drawings*.

Based upon the current solar panel equipment, the Project is designed to accommodate a 7% maximum slope in the panel areas as a conservative approach to managing the potential earthwork. The Project will likely select a panel system that will not require grading in the panel areas. Proposed contours depicted in the *Civil Design Drawings* take into consideration the conservative grading approach to achieve a 7% maximum slope throughout the panel areas, including an area of approximately 291 acres. Exhibit 10: *Geology, Seismology and Soils* of this Application provides more detailed information, including soil types and depth to bedrock, preliminary cut and fill calculations, and general descriptions of typical cut and fill scenarios. Exhibit 10 of this Application also includes reference to the stand-alone geotechnical investigation, provided as Appendix 10-A: *Preliminary Geotechnical Engineering Report* of this Application. Sediment and erosion control measures are addressed in *Civil Design Drawings* and Appendix 13-C: *Stormwater Pollution Prevention Plan* of this Application.

As shown, there will be grading associated with access roads and arrays. However, not all proposed access ways will require grading. New at-grade access corridors lanes will be constructed as stone-capped roads. The impacts of all potential grading areas were included in calculations and shown on the design drawings in order to provide design flexibility during detailed Project design. A final Project design will be prepared by the Contractor and provided in a pre-construction compliance filing prepared pursuant to 19 NYCRR § 900-10.2(c).

The *Civil Design Drawings* also depict up to 6 areas of anticipated construction staging/material laydown areas totaling approximately 19 acres. These areas will be utilized during construction phase activities and include construction preparation, construction equipment storage and parking, workforce parking areas, and the contractor office trailers. The locations of these temporary laydown areas are primarily located in active agricultural lands, and therefore will be constructed and restored in accordance with NYS Department of Agriculture and Markets *Guidelines for Agricultural Mitigation for Solar Energy Projects*.

Electrical Plans

The *Electrical Design Drawings* (Appendix 5-B of this Application) includes Project data on the anticipated panel module type, quantity and inverter quantities. It indicates electrical wiring diagrams, and details, equipment cutsheets and details. The *Electrical Design Drawings* E-Sheets also provide an overall buried electrical collection system and crossing plan, and general arrangement for the substation, switchyard and point of interconnection facilities.

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2) Elevations, Typical, and Details

The *Civil Design Drawings* contain typical design details associated with Project components, including:

- Plan and sections of underground facilities, including single and multiple-circuit layouts with dimensions of proposed depth and level of cover, separation requirements between circuits, clearing width limits for construction and operation of the Project, and Project Footprint;
- Elevations for overhead electric facilities, including height above grade, structure layouts, clearing width limits for construction and operation of the Project, average span lengths for each proposed layout, and structure separation requirements (for installations requiring more than one pole, etc.) for all single and multiple-circuit layouts. The only overhead facilities will be:
 - Existing NYPA's Dysinger to New Rochester 345-kilovolt transmission line will be looped in and out of the proposed switchyard. The loop in and loop out section of new line will be approximately 223 feet.
 - A new gen-tie line will be installed to connect the proposed substation with the proposed switchyard. This section of the gen-tie line will be approximately 424 feet.
- Preliminary substation arrangements, elevations, and one-line diagrams. Additional information on the interconnections is provided in Exhibit 21: *Electric Systems Effects and Interconnection of* and in Appendix 21-A: *System Reliability Impact Study* of this Application. Further details also are provided in Exhibit 22: *Electric and Magnetic Fields* of this Application.
- Typical access road installation plans and views with dimensions, stormwater management, and materials;
- Erosion and sediment control details;
- Typical foundations (piers, etc., including dimensions) to be used for solar panel installations;
- Typical details associated with trenchless installations, including typical staging areas, construction machinery arrangements, and bore pits; and,
- Technical data sheets associated with solar panels (indicating dimensions of panel system[s]) to be used for the Project.

The Project will not require the construction of any buildings or structures that would necessitate architectural drawings, or elevation drawings associated with building construction.

3) Wind Turbine Suitability Report

The requirements of this section do not apply to the Project.

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4) Conformance with Engineering Standards

The list of codes and standards with which the Applicant has conformed, and will conform with during the planning, design, construction, operation, and maintenance of the Project, is provided below.

- The Aluminum Association;
- American Association of State Highway and Transportation Officials Standard for Aggregates;
- American Concrete Institute;
- American Institute of Steel Construction; American National Standards Institute;
- American Society of Civil Engineers, in particular American Society of Civil Engineers 7-05, Minimum Design Loads for Buildings and Other Structures;
- American Society of Mechanical Engineers;
- American Society of Testing and Materials;
- American Welding Society;
- Concrete Reinforcing Steel Institute;
- Edison Electric Institute—Association of Illuminating Companies;
- Federal Energy Regulatory Commission;
- Insulated Cable Engineers Association;
- International Building Code;
- Institute of Electrical and Electronics Engineers;
- International Electrotechnical Commission;
- National Bureau of Standards;
- National Electrical Code;
- National Electrical Manufacturers Association;
- National Electrical Testing Association;
- National Electric Safety Code;
- National Fire Protection Association;
- National Institute of Standards and Technology;
- National Ready Mixed Concrete Association;
- Occupational Safety and Health Administration, in particular, 40 Code of Federal Regulations 1910.269 Training;
- Portland Cement Association;
- Rural Electrification Administration;
- Society for Protective Coatings;
- Uniform Building Code;
- Uniform Plumbing Code; and
- Underwriters Laboratories, Inc.

5) Manufacturer Information

Data sheets for major equipment are provided in the plan sets included in the *Civil Design Drawings* on Sheets 19 to 20 of the electrical set which contain safety and testing information.