



SOMERSET SOLAR, LLC

MATTER NO. 22-00026

§900-2.6 Exhibit 5

Design Drawings

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ACRONYM LIST

§	Section
Facility	Somerset Solar Facility
Facility Substation	Somerset Collector Substation
kV	kilovolt
LOD	limit of disturbance
MVA	mega-volt amp
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NYSEG	New York State Electric and Gas Corporation
PE	Professional Engineer
POI	point of interconnection
PV	photovoltaic
ROW	right-of-way
SWDA	Solid Waste Disposal Area
Town	Town of Somerset

Glossary Terms

Applicant	Somerset Solar, LLC, a subsidiary of The AES Corporation, Inc. (AES), the entity seeking a siting permit for the Facility Site from the Office of Renewable Energy Siting (ORES) under Section (§) 94-c of the New York State Executive Law.
Application	Application under §94-c of the New York State Executive Law for review by the ORES for a Siting Permit.
Facility	The proposed components to be constructed for the collection and distribution of energy for the Somerset Solar Facility, which includes solar arrays, inverters, electric collection lines, and the collection substation.
Facility Site	The limit of disturbance (LOD) that will be utilized for construction and operation of the Facility, which totals about 696 acres on the Project Parcels in the Town of Somerset, Niagara County, New York (Figure 2-1).
Project Parcels	The parcels that are currently under agreement with the Applicant and Landowner, totaling about 1,784 acres in the Town of Somerset, Niagara County, New York, on which the Facility Site will be sited (Figure 3-1).
Project Site	The acreage of the Project Parcels under agreement between the Applicant and the Landowner, consisting of approximately 1,396 acres, in which the Applicant has performed diligence, surveys and assessments in support of Facility design and layout.

EXHIBIT 5 Design Drawings

This exhibit addresses the requirements specified in 19 New York Codes, Rules and Regulations (NYCRR) Section (§) 900-2.6 regarding design drawings.

The Preliminary Design Drawings and supporting documentation prepared for the Application are provided within Appendix 5-A and Appendix 5-B and were developed under the direction of Professional Engineers (PEs) licensed and registered in New York State (NYS). The Somerset Solar Facility (Facility) has been designed to meet or exceed the requirements under §94-c regulations, including setback requirements and maximum panel height. The Applicant intends to conform to all applicable engineering codes, standards, guidelines, and practices during the planning, designing, construction, and operation of the Facility's solar arrays, electric collection system, substation, and interconnection. The Facility has been designed to comply with 19 NYCRR §900-2.6 and the Uniform Standards and Conditions.

As described in Exhibit 2, the proposed Facility is an approximately 125-megawatt, alternating (AC) current solar electric generating facility proposed within the approximately 696-acre limit of disturbance (LOD or Facility Site), located in the Town of Somerset, Niagara County, New York (Town). Electric generating components, including the Somerset Collector Substation (Facility Substation), electrical collection lines, and inverters will be installed entirely within the Facility Site. The Facility also includes the construction of 5.1 miles of access roads, the majority of which are within the Facility, some of which will connect to existing public roadways. Interconnection facilities required for the Facility include an approximately 159-foot overhead, three-phase AC, double-bundled 345 kilovolt (kV) interconnection gen-tie line which will tie the Facility Site to the existing New York State Electric and Gas Corporation (NYSEG) Kintigh Substation and 345-kV transmission line. The following subsections include descriptions of the proposed Facility components and reference the applicable locations where the information can be found on the Preliminary Design Drawings included as Appendix 5-A and Appendix 5-B.

5(a) Statement of Engineer Qualifications

The Preliminary Civil Design Drawings for the Facility, provided as Appendix 5-A, were prepared using computer software (i.e., AutoCAD) under the direction of PEs that are licensed and registered in NYS and employed by Tetra Tech, Inc. (Appendix 5-A). The Preliminary Electrical Design Drawings, including the Preliminary Design for the Facility Substation, provided as Appendix 5-B, were prepared using computer software (i.e., AutoCAD) under the direction of PEs who also are licensed and registered in NYS and employed by Tetra Tech, Inc. and Avoca Engineers & Architects.

5(b) Conformance with Setback Requirements for Wind Turbines

The proposed Facility is a solar project. Therefore, this section is not applicable.

5(c) Wind Turbine Model Descriptions

The proposed Facility is a solar project. Therefore, this section is not applicable.

5(d) Conformance with Setback Requirements for Solar Facilities

The Facility has been designed to meet the Office of Renewable Energy Siting setback requirements set forth in Table 2 of §900-2.6, as shown in Table 5-1 below. Participating property line setbacks meet Solar Law requirements identified in the Town ordinance, and the setback for non-participating occupied residences and centerline of public roads exceed the Solar Law requirements. The §94-c setbacks identified from the centerline of public roads, non-participating residential property lines, and non-participating property lines for non-residential properties have been applied and are less than the requirements identified in the Town's Solar Law (Table 5-1). The applied Facility setbacks outlined in Table 5-1 are shown in the general site plan drawings required by this exhibit. Fencing, collection lines, access roads, and landscaping may occur within these setbacks.

Table 5-1. Town, §94-c and Facility Setbacks

Setback Type	§94-c Setbacks (§900-2.6)	Town of Somerset Local Law Solar Requirements ¹	Facility Setbacks
Participating property line	N/A	50 feet (from property line)	50 feet
Participating occupied residence	N/A	100 feet	N/A (none of the participating properties contain an occupied residence)
Non-participating occupied residences	250 feet	400 feet (from property line) ²	Minimum 250 feet
Centerline of public roads	50 feet from centerline of public roads	200 feet (from the edge of any road right-of-way)	50 feet minimum from edge of road right-of-way
Non-participating residential property lines	100 feet	200 feet (measured from the fence surrounding the solar panels and equipment)	Minimum 100 feet

Setback Type	§94-c Setbacks (§900-2.6)	Town of Somerset Local Law Solar Requirements ¹	Facility Setbacks
Non-participating property lines (non-residential)	50 feet	N/A	Minimum 50 feet
<p>1 – Requirements identified for Tier 3 solar systems as identified in the Town of Somerset Local Law No. 3 Amending Article XXII of Chapter 205 of the Town Code- Solar Energy Systems (“2022 Solar Law”).</p> <p>2 – Section 205-112 Special Use Permit Standards of the Town’s 2022 Solar Law identifies all Tier 3 solar energy systems shall be set back a minimum of 200 feet from the fence surrounding the solar panels and equipment to all nonparticipating property lines and to the edge of any road right-of-way. This setback shall be a minimum of 50 feet from a participating property line. Additionally, the setback from the fence line shall be a minimum of 400 feet from a dwelling unit on an adjoining non-participating property. The setback to any off-site participating dwelling unit shall be 100 feet.</p>			

5(e) Height Restrictions

Two types of solar arrays are proposed: fixed tilt and tracking systems. Fixed tilt arrays will have a maximum panel height of 7.14 feet from grade, and single-axis tracker system panels will have a maximum height at full tilt of 10.24 feet from grade (Appendix 5-B, Sheets PV-E.05.11 and PV-E.05.12). The Town’s Solar Law for Tier 3 systems identifies solar energy systems be less than or equal to 20 feet in height. The Facility has been designed to comply with the Town’s Solar Law. As identified in §900-2.6(e) of §94-c regulations, this height restriction does not apply to electric collection, transmission or Facility Substation components.

5(f) Preliminary Design Drawings

(1) Site Plans

(i) Solar Facility Site Plan Drawings

The Preliminary Civil Design Drawings constitute the Site Plan for the Facility and have been prepared at a scale of 1 inch = 200 feet. The Applicant has provided two full-size hard copy sets of the Preliminary Civil Design Drawings provided as Appendix 5-A (22 x 34 inches). As required, these drawings depict all Facility components and features, including the following:

(a) Solar Panels and Setbacks.

Solar panels, inverters, low-medium transformers, property lines, and applicable setbacks identified in Table 5-1. The overall site layout depicts the locations of the Facility solar arrays, property lines, and the applicable setbacks described above in section 5(d) of this exhibit. Detailed drawings inclusive of solar arrays, inverters,

property lines, and setbacks (as well as additional Facility components) are depicted on Appendix 5-A, Sheets PV-C.02.00–PV-C.02.10. The Facility consists of 280,603 solar modules consisting of 26 modules per string for the fixed tilt racking and 27 modules per string for the single axis tracker racking (total of 10,450 strings). Solar modules include both fixed tilt (40,222) and tracker-style modules (240,381). The single axis tracker system will be installed in rows aligned north-south, consisting of one (1) module wide in portrait. When in their horizontal position, they will have 7–8 feet of ground clearance and 10.5 feet of space between the panel rows. The fixed tilt racking solution is '2P' featuring two modules in portrait across the rows of panels. The fixed tilt racking is aligned east-west. The photovoltaic (PV) arrays are sited within a total of 10 sub-arrays (Areas 1–10) located within the Facility Site.

The Facility proposes to use 40 inverters located throughout the panel arrays, including sixteen (16) Sungrow SG3150U-MV and twenty-four (24) Sungrow SG3600UD-MV inverters. The Facility Substation includes a 84/112/140 mega volt-amp (MVA) rated step up transformer which steps up the voltage from the collection line voltage of 34.5 kV to 345 kV for interconnection to the NYSEG Kintigh Substation and 345 kV transmission system. The Facility Substation transformer is shown on the collection substation switching one-line diagram, Appendix 5-B, Sheet HV-E.02.01.

(b) Extents of proposed access road travel lanes (including indications of any existing access roads to be utilized).

Any turn-around areas/temporary road improvements for component deliveries are provided in Appendix 16-A. The Facility includes construction of 15 new access roads and 19 new access entrances. Site entrance improvement details are included on Appendix 5-A, Sheets PV-C.07.01 and PV-C.07.02. Use of existing access roads, with limited upgrades required, have been incorporated into the design. In addition, 15-foot and 20-foot-wide non-graveled access corridors will be maintained throughout the PV array areas for perimeter access around the arrays. Proposed permanent access road widths vary throughout the Facility, with the majority designed at 20 feet wide, which is consistent with local fire code. The Facility contains a total of 5.1 miles of permanent access roads. Additional 15-foot-

wide access corridors designated for Operations & Maintenance access to the PV arrays are dispersed throughout the Facility.

(c) Electric cable collection line corridors (including an indication of permanent rights-of-way [ROWs]).

Overhead, aboveground, and underground cable routes are differentiated; mapping identifies any locations of proposed trenchless collection line installations, including the approximate lengths of such electric line routes. No splice vaults¹ are proposed for the Facility. The Facility includes 70,662 linear feet of 34.5 kV collection lines that will gather power from the inverters and transport via underground and aboveground cables to the Facility Substation. Underground collection lines will be installed via trenching, with the exception of eight locations where cabling will be installed aboveground on sleepers (limited to areas where the cables cross the coal storage pile and existing landfill area [Solid Waste Disposal Area (SWDA) II] on the Project Site), and 21 areas where horizontal directional drilling will be employed to avoid impacts to sensitive resources and road crossings. Collection lines have been co-located with access roads to the maximum extent practicable to reduce the extent of impacts within the Facility Site. Overhead lines are limited to an approximately 159-foot transmission line that will connect the Facility Substation to the Point of Interconnection (POI) at the NYSEG Kintigh Substation. Specific details regarding collection lines are located in Appendix 5-B, Sheets PV-E.01.09, PV-E.08.01 and PV-E.08.02. Appendix 5-B, Sheets PV-E.01.09 and PV-E.08.03 provides details for locations where horizontal directional drilling is proposed.

(d) The existing electric transmission line (which the Facility will interconnect to) and any known existing utilities (including pipelines) and associated ROWs within the Facility Site.

A new proposed 345-kV interconnection line will originate from the Facility Substation and extend approximately 159 feet to the POI at the NYSEG Kintigh Substation. Interconnection details, including the location of the new transmission structures proposed are shown on Appendix 5-B, Sheets CL-E.01.01, TL-P.00.01,

¹ Any medium voltage line splices that are needed will be above grade in sectionalizer or similar junction cabinets. See detail in Appendix 5-B, Sheet PV-E.06.01.

TL-P.01.01, and TL-P.02.01. There are currently a few areas that contain exiting utilities that are adjacent to the proposed construction of solar facilities and their associated infrastructure. An underground telecommunication line is present running north-south just west of the Kintigh Substation along the perimeter access road. This line connects the Kintigh Substation to the network of communication lines running parallel to NYS Route 18/Lake Road. It is proposed to be relocated to provide communication services to the Facility Substation. As proposed, the underground telecommunication line feeding the existing Kintigh Substation will be relocated with new telecommunications lines added to feed the new Facility Substation and guard shack. According to the ALTA survey (Figure 4-1), an easement line is present on the west side of the wire path, however, no width is specified. More information on this line can be found in Appendix 5-A, Sheets PV-C.01.01 and PV-C.02.01. Additionally, electric transmission lines that connect to the Kintigh Substation run north-south through the entire Facility and offsite. Lastly, a Town sewer line running east-west with a 35-foot wide easement is present just off of Niagara County Route 108/Hartland Road. No proposed construction is within the easement and Facility components will not affect the existing utility (Appendix 5-A, Sheet PV-C.01.07). Figure 3-6, Figure 15-4 and Figure 20-1 identify area utility, energy infrastructure, and telecommunication lines mapped within the 1-mile and 5-mile study areas for the Facility.

(e) Approximate LOD for all Facility components (i.e., panels, access roads, electric line corridors, Facility Substation, fence line).

LOD is approximately 696 acres and includes the limits of all areas to be disturbed as part of Facility construction². The LOD also includes temporary laydown yards, tree/shrub clearing and grubbing limits, and selective tree/shrub cutting limits.

(f) Approximate clearing limits for all Facility components (i.e., panels, access roads, buildings, electric lines, shading vegetation).

These are shown on Appendix 5-A, Sheets PV-C.01.01–PV-C.01.10). Approximately 93 acres of tree/shrub clearing and grubbing and tree/shrub selective cutting are proposed for construction of the Facility, including

² - Five road crossings required for underground electrical collection lines along New York State Route 18/Lake Road will be installed using horizontal directional drill methods. These are located outside the limit of disturbance as shown on Appendix 5-A, Sheet P-V-C.02.00.

approximately 82 acres of tree/shrub clearing and grubbing, and approximately 11 acres of selective tree/shrub cutting to prevent shading of the panel arrays. Vegetative clearing and grubbing and selective cutting has been minimized to the maximum extent practicable for construction, placement of Facility components, and to prevent module shading during operation.

(g) Extents of collection and interconnection stations and any applicable local setbacks are identified in Appendix 5-B.

The Facility Substation, interconnection, and existing NYSEG ROW is depicted in Appendix 5-B, Sheet TL-P.00.01. The Facility Substation will be accessible via an existing, private access road located off NYS Route 18/Lake Road, and adheres to both §94-c and the Town setback requirements. Full details of the collection and interconnection design are located in Appendix 5-B.

(h) Energy storage system(s).

Energy storage systems such as battery storage are not proposed for the Facility.

(i) Site security features, including the location of perimeter fencing is identified on Appendix 5-A, Sheets PV-C.02.00–PV-C.02.10.

A discussion of site security for the Facility is included in Exhibit 6, including security features such as access controls, electronic security and surveillance, security lighting, and cyber system security. Additionally, a Site Security Plan detailing security features and risk mitigation measures has been included as Appendix 6-A. The security fencing for the array will consist of a 7-foot-tall chain link fence, with no barbed wire, and 7-foot tall agricultural style fence surrounding the Facility as shown on Appendix 5-A, Sheets PV-C.09.01–PV-C.09.04. Locked gates will be included at each access point, and only be accessible by the Applicant's authorized employees and emergency responders. Fencing specific to the Facility Substation is shown on Sheet PV-C.09.03. The fencing will be 7 feet in height with an additional 1 foot of barbed wire for additional security at the Facility Substation. The locations of Facility fencing are shown on Appendix 5-A, Sheets PV-C.02.00–PV-C.02.10. The Facility Substation Lighting Plan is provided as Appendix 5-B, Sheet HV-P.13.01 and the Facility Substation security system in the control building is shown on Appendix 5-B, Sheet HV-P.14.01. Specification sheets for the security lighting system is provided in Appendix 5-E.

(j) Other landscaping improvements

Other landscaping improvements are provided in Appendix 5-A, Sheets PV-C.05.01–PV-C.05.04. The landscape drawings detail the location of proposed vegetative screening in relation to Facility components and adjacent sensitive receptors. Additionally, Appendix 5-A, Sheets PV-C.05.01–PV-C.05.04 include a planting schedule, that identifies the quantities and types of tree and shrub species that are proposed. Typical planting details for trees and shrubs are shown on Appendix 5-A, Sheet PV-C-07.03 and landscaping notes can be found on Appendix 5-A, Sheet PV-C.00.03. No berms or retaining walls are proposed for the Facility.

Potential noise exceedances identified in the noise modelling and assessment completed for the Facility (Exhibit 7), include noise levels for the Facility Substation transformer and at two inverters located in Area 5. These potential noise exceedances have been addressed through incorporation of a sound wall at the Facility Substation (Appendix 5-B, Sheets HV-P.01.01 and HV-P.02.) and two acoustic sound walls located along the eastern property line of Area 5 of the Facility Site (Appendix 5-A, Sheet PV-C.02.05).

(ii) Wind Facility Site Plan Drawings.

The proposed Facility is a solar project, and therefore, this section and subsections (ii)(a) through (ii)(l) are not applicable.

(2) Drawing Specifications

The Applicant has provided the following typical design detail drawings within Appendix 5-A as required by the §94-c regulations. The plans were prepared using AutoCAD Civil 3D design software and are generally presented at a scale of 1 inch equals 200 feet, with the exception of those that provide an overview of the Facility Site or details of specific features.

(i) Typical Elevation Drawings.

Typical elevation drawings for the Facility Substation and interconnection facilities are included in Appendix 5-A and Appendix 5-B and described further in subsections 5(e)(2)(i)(b) and (c) of this exhibit. Drawings include indicating the length, width, height, material of construction, color and finish of all buildings, structures, and fixed

equipment, which are described in more detail below. A control building is proposed for inclusion at the Facility Substation.

(a) Wind Turbine Elevation Drawings.

The proposed Facility is a solar project. Therefore, this subsection is not applicable.

(b) Interconnection Facilities Drawings.

Interconnection facilities include a new 345 kV transmission line that originates from the Facility Substation and extends to the POI at NYSEG Kintigh Substation and their Rochester to Somerset 345-kV transmission line (Figure 3-6). An elevation drawing for the interconnection line and proposed new transmission structures is included on Appendix 5-B, Sheet TL-P.01.01, with additional details on Appendix 5-B, Sheet TL-P.02.01. The proposed interconnection line is approximately 159 feet long, with an H-frame. The color of the line will be galvanized gray and will be unguyed direct buried steel poles.

(c) Facility Substation Drawings.

Collection substation drawings include fencing, gates, take-off structure, and all Facility Substation equipment. A general arrangement plan has been included in the drawing set showing elevation mark pointers (arrows) with reference to associated elevation views including views of all components of the Facility Substation (Appendix 5-B, Sheet HV-P.01.01), with additional electrical equipment elevations shown on Appendix 5-B, Sheets HV-P.02.01, HV-P.02.02, and HV-P.15.01.

(d) Energy storage system(s), such as battery storage, are not proposed for the Facility.

(ii) Permanent Points of Access Drawings.

Each proposed permanent point of access or access type includes a typical installation plan view, cross section, and side view with appropriate dimensions (temporary and permanent width(s)) and identification of materials to be used along with corresponding material thickness, shown on Appendix 5-A, Sheets PV-C.03.01–PV-C.03.10, PV-C.06.01–PV-C.06.04 and PV-C.07.01–PV-C.07.02. No other proposed access features (e.g., helicopter or barge placement) are proposed for the Facility.

(iii) **Underground and Aboveground Infrastructure Drawings.**

Typical underground and aboveground infrastructure/collection system details have been provided, 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, LOD, required permanent ROW and a description of the cable installation process. Appendix 5-B, Sheets PV-E.01.09, PV-E.08.01 and PV-E.08.02 include details on the collection system and installation information.

(iv) **Overhead Electrical Transmission and Collection Drawings.**

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, structure layouts are shown Appendix 5-B, Sheets TL-P.00.01, TL-P.01.01, and TL-P.02.01.

(3) Compatibility of Wind Turbine with Existing Conditions

The proposed Facility is a solar project. Therefore, this section is not applicable.

(4) Engineering Codes, Standards, and Guidelines

The Applicant intends to conform to the listed engineering codes, standards, guidelines noted below; and practices to conform to during the planning, designing, construction, and operation of the Facility's solar arrays, electric collection system, Facility Substation, transmission line, interconnection, and associated structures, as applicable.

- American Association of State Highway and Transportation Officials Standard for Aggregates
- American National Standards Institute
- American Society of Civil Engineers,
- American Society of Mechanical Engineers
- American Society of Testing and Materials
- American Welding Society
- Concrete Reinforcing Steel Institute
- 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 Electrical 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
- Uniform Building Code
- Uniform Plumbing Code

(5) Design, Safety, and Testing of Equipment

The Applicant intends to utilize a solar module similar to the BYD MLTK-36 540W Bifacial Module. The Applicant also is proposing to utilize the NEXTracker DuraTrack HZ v3 array tracking system, or similar, and the TerraSmart fixed tilt racking system or similar, both of which will be installed with minimal ground disturbance via driven posts. For the array to be located inside the loop track where the coal storage pile area is and the array to be located on the capped coal ash landfill (SWDA II), a ballasted fixed tilt racking system will be used to avoid penetrating the liner or cap that is present in these areas. Specification sheets for the proposed solar modules and racking systems (single axis-tracking systems) are included in Appendix 2-A (modules) and Appendix 2-B (racking). Fixed tilt panels on ballasted racking systems also are included in the Facility design; however, the manufacturer of these Facility components have not yet been identified. The Facility DC solar source circuits will include a messenger cable type hanger system, or conduit on

sleepers for the above ground cabling system, or where feasible, an underground system to connect the solar module strings to the inverters and ultimately to the medium voltage collection system which will route back to the Facility Substation. The Applicant intends to use central inverters from Sungrow, models SG3600UD-MV and SG3150U-MV, or a similar inverter, for this Facility. Specification sheets for these inverters are included in Appendix 5-C. Available specification information for the main power step up transformer at the Facility Substation is included in Appendix 5-D. All Facility components including the solar modules, collection system, inverters, Facility Substation, transmission line, and interconnection systems have been designed to meet the specifications that are provided by the manufacturer of each component and specifications listed in section 5(f)(4) of this exhibit. All systems will be tested prior to commercial operation of the Facility and to ensure components are functioning properly.