COMMONWEALTH OF KENTUCKY

BEFORE THE KENTUCKY STATE BOARD ON ELECTRIC GENERATION AND TRANSMISSION SITING

In the Matter of:

Electronic Application of Caldwell Solar, LLC for Certificate of Construction for an up to 200 Megawatt Merchant Electric Solar Generating Facility in Caldwell County, Kentucky	))))	Case No. 2020-00244

Notice of Filing Amended Exhibit B to the Application

Caldwell Solar, LLC ("Caldwell") provides this Notice of Filing of Amended Exhibit B to the Application. Amended Exhibit B is attached herewith and includes the most up-to-date technology, equipment details, and figures for the proposed Project.

Respectfully submitted,

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EXHIBIT B
DESCRIPTION OF PROPOSED SOLAR GENERATION FACILITY SITE

Requirements

<u>KRS 278.706(2)(b)</u>: A full description of the proposed site, including a map showing the distance of the proposed site from residential neighborhoods, the nearest residential structures, schools, and public and private parks that are located within a two (2) mile radius of the proposed facility.

Compliance

Caldwell Solar, LLC (Caldwell), a wholly owned subsidiary of National Grid Renewables Development, LLC, is proposing the Caldwell Solar Facility (Project), which will be an up to 200-megawatt alternating current photovoltaic (PV) electricity generation facility. Project facilities will include solar panels, inverters, racking, fencing, access roads, a substation, a switchyard, an operations and maintenance (O&M) building, a parking lot, below- and above-ground electrical collection lines, up to eight weather stations (up to 20 feet tall), and temporary construction laydown yards. The Project will be located on approximately 3,000 acres in Caldwell County between the towns of Fredonia and Princeton. No street address has been established at this time for the Project; the coordinates for the location are 37.085563°N and 87.592701°W. For interconnection, Caldwell will construct a substation within the project boundary to connect to the Caldwell County to Barkley 161-kV transmission line owned by Big Rivers Electric Corporation. A map showing the location of residential structures, schools, and public and private parks in relation to the proposed Project is presented in Exhibit I, Figure 1. A preliminary site plan and maps showing the Project structures, associated facilities, and boundaries are included in Exhibit J and Exhibit I.

Design

The Project will use solar panels with tempered glass varying in size from approximately 4 to 7 feet long by 2 to 4 feet wide and 1 to 2 inches thick. The solar panels include heat-strengthened front glass, a rear back cover made of either heat-strengthened glass or polymer film, an aluminum exterior and rear frame, laminate encapsulation for weather protection, a semiconductor layer or silicon cells wired in series, a junction box on the rear side, and electrical lead wires to connect the module to adjacent units. To limit light reflection, solar panels are constructed of dark, light-absorbing materials with anti-reflective coatings. The solar panels can reflect as little as two percent of the incoming sunlight depending on the angle of the sun. The solar panels will occupy most of the area inside the Project.

The solar panels will be installed on either a fixed-tilt rack system or a tracking rack system that uses galvanized steel and aluminum for the foundations and frame. Each rack will contain multiple solar panels. On the fixed-tilt or tracking rack system, the solar panels will be approximately 10 to 15 feet in height from the ground to the top of the solar panels when at a 45-degree angle. The height may vary by manufacturer and due to topography and vegetation constraints, the top of the panels could reach approximately 20 feet from the ground. Both rack systems are mounted on top of steel piers that are typically driven into the ground, without the need for excavation or concrete for the installation of the piers. Piers are typically installed at 8 to 15 feet below the ground surface, pending site-specific conditions that will be determined through geotechnical borings prior to construction. Figure 1 through Figure 3 shows the general racking equipment and dimensions of the rack systems.

Linear Axis Tracking System

A linear axis tracking rack system allows the solar panels to track the position of the sun throughout the day. The solar panels and tracking rack system are generally aligned in rows running north and south with the solar panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The solar panels are rotated by a small motor connected to the tracking rack system to slowly track with the position of the sun throughout the day. The tracking rack system optimizes the angle of the solar panels in relation to the sun throughout the day, thereby maximizing the production of electricity and the capacity value of the Project.

Fixed-Tilt Racking System

A fixed-tilt racking system remains in a fixed position and does not rotate. The solar panels and rack system are installed in rows running east and west with the solar panels facing south for optimal sun irradiance.

Due to unique site constraints and ever-evolving technology, it is common for solar project developers to consider using both racking systems. The final decision on racking systems is often made at final design and can be based on several factors, such as material availability, economics, and site constraints. Caldwell Solar's preliminary design assumes a tracking system will be utilized; however, Caldwell Solar is keeping fixed-tilt racking as an option. If fixed-tilt racking were to be used, the site layout would be similar, but the rack system rows would run east to west with the solar panels facing south in a fixed position. The panel height, construction impacts, and operation activities will be relatively the same for either racking system, In no event will panels be setback a less than 200 feet from residences. If Caldwell Solar decides to utilize a fixed-tilt system at final design, in addition to filing the final plan set, Caldwell Solar will complete an updated glare study to ensure glare on neighboring homes will not be an issue.

Figure 1A Tracking Rack System

Figure 1B Fixed Tilt Rack System

Figure 2A Approximate Tracking Rack System Dimensions

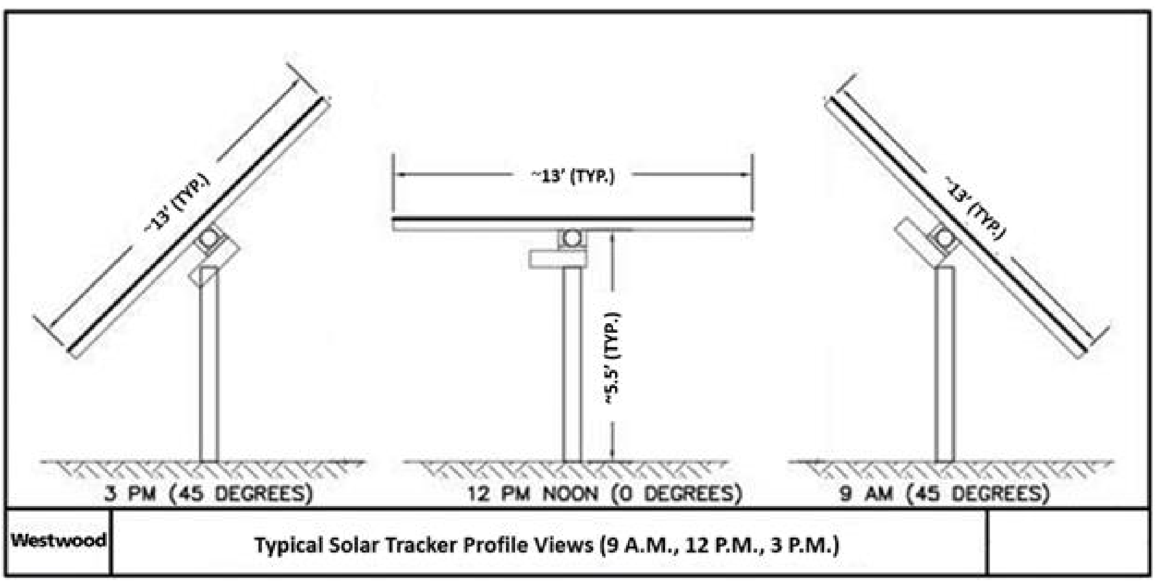


Figure 2B Approximate Fixed Tilt Rack System Dimensions

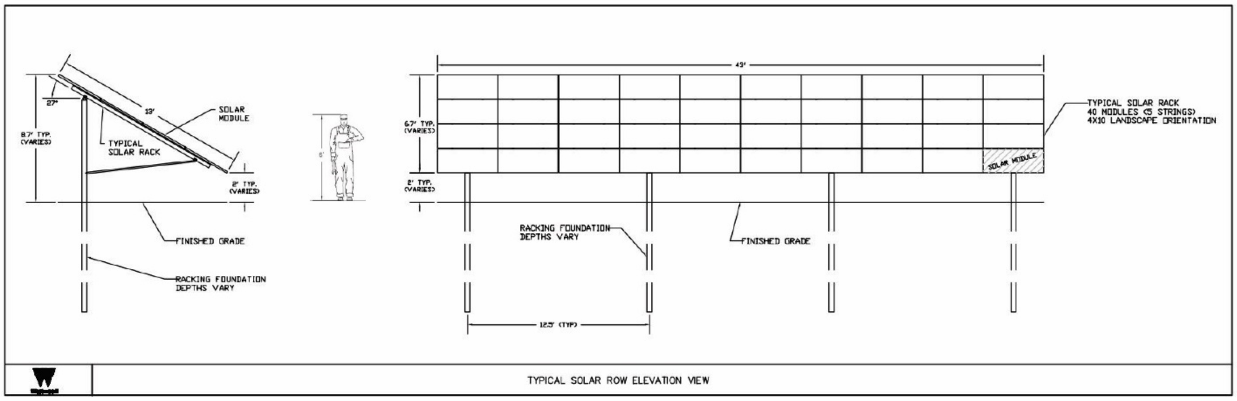


Figure 3 Standard Steel Pier Foundations

Inverters, Transformers, and Electrical Collection System

Inverter skids will be utilized at locations throughout the Project area and will include a transformer to which the inverters will feed electricity (Figure 4). The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design proposes 65 central inverter skids. These skids provide the foundation for the inverter, transformer, and Supervisory Control and Data Acquisition (SCADA) system. The skids will be placed atop a concrete slab or pier foundations and typically measure 10 feet wide by 25 feet long, with a structure height of approximately 12 feet above grade (Figure 4). Concrete foundations will be poured onsite or precast and assembled off-site.

The inverters are within the interior of the Project along access roads. Figure 4 below shows a central inverter and step-up transformer station.

Electrical wiring will connect the panels to inverters, which will convert the power from DC to AC. The AC will be stepped up through a transformer from the inverter output voltage to 34.5 kV and brought via the collection cables to the Project substation. The electrical collection system will be installed below or above ground, or a combination of both. The type of electrical system will be determined prior to construction based on technology, availability of materials, and costs. Both below-ground and above-ground collection systems are currently used at utility-scale solar projects. The electrical cables that would be used for each type of electrical collection system are described below.

Below-ground Electrical Collection System

The panels deliver DC power to the inverters through cabling that will be located in a below-ground trench (approximately 4 feet deep and 1 to 2 feet wide). Inverters convert approximately 1,500 volts of DC output of the PV panels to between 650 and 950 volts of AC. Then, a step-up transformer converts the inverter AC voltage to an intermediate voltage of 34.5kV. Below-ground AC collection systems from the inverter skids to the substation will be installed in trenches or ploughed into place at a depth of at least 3 feet below grade. During all trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with the Agricultural Impact Mitigation Plan (AIMP). Once the cables are laid in the trench, the area will be backfilled with subsoil followed by topsoil. Electrical collection technology is rapidly evolving and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system.

Figure 4 Typical Inverter and Transformer Station

Above-ground Electrical Collection System

An above-ground electrical system is being considered for the Project for several reasons, including ease of access for operations and maintenance, reduced ground disturbance, and cost considerations. If above-ground cabling is utilized, the DC collection cables will be strung under each row of panels on steel arms, and a steel cable will be attached to the piles. At the end of each row, hanging brackets will connect several racks/rows of cables to a common collection point near their assigned inverter/transformer skid. At the collection point, the cables will be routed below ground at a minimum depth of at least 30 inches below grade to the inverter/transformer skid, where the current is converted to AC and the voltage is stepped up to 34.5 kV. A drawing of the typical structure of the hanging brackets at the end of each row is provided below in Figure 5. The electrical cables will then be routed below ground at a minimum depth of at least 3 feet below grade to a distribution-type pole. These poles will be made of wood or steel, approximately 12-18 inches in diameter, up to 90 feet in height, and spaced approximately 200-300 feet apart. Caldwell will utilize either one overhead collection line or two overhead collection lines running in parallel, spaced approximately 60 feet apart. Final engineering will determine the need for one or two collection lines. Figure 6 provides a schematic of the above-ground collection system components and configuration. The electrical cables will then be strung on poles to the Project substation. Above-ground medium voltage collection technology is rapidly evolving and, if utilized, the number of poles will be determined based on final engineering. Cables connecting each unit of solar arrays will be directionally bored under or spanned over public roads.

Figure 5 Typical Above-Ground Collection Hanging Bracket

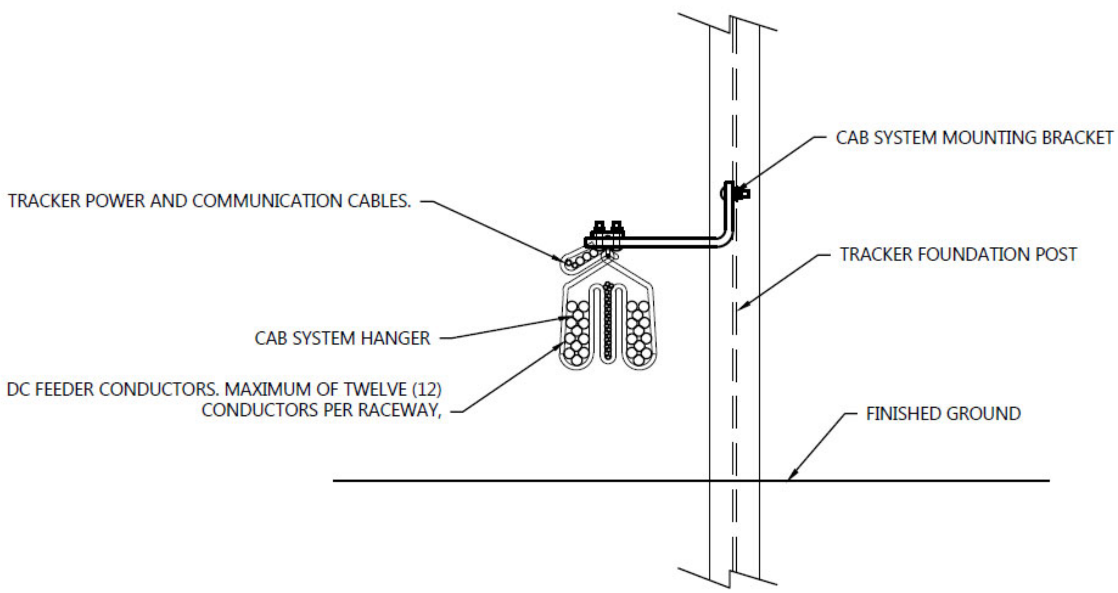
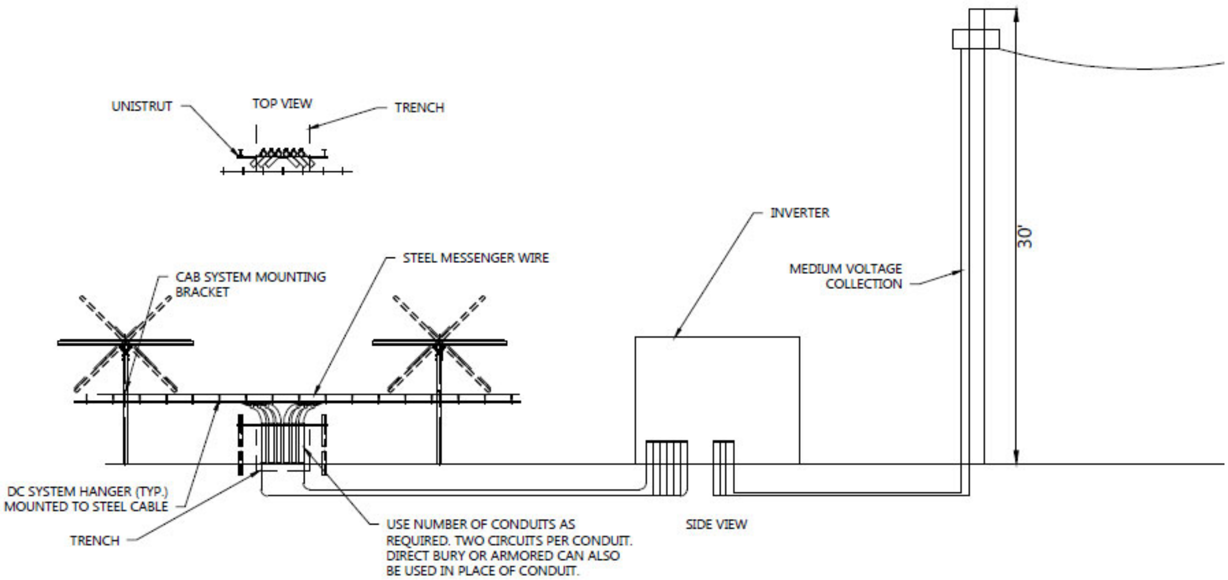


Figure 6 Typical Above-Ground Collection System Components and Configuration



Hybrid Below-ground and Above-ground Electrical Collection System

A hybrid below-ground and above-ground electrical system is also being considered for the Project for several reasons that are advantageous to the above-ground electrical system, including ease of access for operations and maintenance, reduced ground disturbance, and cost considerations. Similar to those in the above-ground system, the DC collection cables will be strung under each row of panels on steel arms and a steel cable attached to the piles. At the end of each row, hanging brackets will connect several racks/rows of cables to a common collection point near their assigned inverter/transformer skid. At the collection point, the cables will be routed below-ground at a minimum depth of at least 30 inches below grade to the inverter/transformer skid, where the current is converted to AC and voltage is stepped up to 34.5 kV. A drawing of the typical structure of the hanging brackets at the end of each row is provided above in Figure 5. The electrical cables will then be routed below-ground at a minimum depth of at least 38 inches below grade to the Project substation. Cables connecting each unit of solar arrays will be directionally bored under public roads.

Access Roads

The Project will include approximately 18.5 miles of graveled access roads that connect the Project facilities to public roads. The final length of the access roads will depend on the equipment selected and final engineering. These roads will be approximately 16-20 feet wide along straight portions of the roads and wider along curves and at internal road intersections (approximately 40 feet). The access points to the Project from public roads will have gates.

Caldwell has designed access roads for effective and efficient access for O&M and for safe ingress and egress of employees, visitors, and emergency responders. Caldwell has minimized the amount of access roads for the Project. For example, access roads provide access to all portions of the site and every central inverter, but not every block of solar panels has an access road along its entire perimeter. This design minimizes the amount of ground disturbance and new impervious surfaces while still providing effective and efficient site access.

Safety Features

The Project will be surrounded by a 6-foot-tall fence consisting of chain link, woven wire, or welded wire and topped by barbed and/or smooth wire for security, per National Electrical Code Article 110. Outside the fence, vegetative buffers will be planted as screens where the solar panels and other electrical equipment are adjacent to residences. Vegetative buffers will consist of evergreen and/or deciduous trees and shrubs.

The Project will have security cameras and down-lit security lighting at strategic locations throughout the facility. The typical lighting pole height will be 10 feet, and lights will be operated manually by switch and motion activation. The lights at each inverter will be down lit and switch-controlled for repair purposes.

Associated Facilities

Project Substation and Switchyard

The Project substation will be a 34.5/161-kV step-up substation with metering and switching gear required to connect to the transmission grid. It will be designed according to regional utility practices and the National Electrical Safety Code. The area within the substation will be graveled to minimize vegetation growth in the area and reduce fire risk. The substation will be fenced with a 7-foot-tall chain-link fence topped with 1 foot of barbed wire for security and safety purposes. At the completion of construction, the substation and switchyard area will be approximately 3 acres.

Operations and Maintenance Building, and Parking

An O&M building will provide access and storage for Project O&M equipment. Caldwell will obtain any required building permits for the O&M building from Caldwell County prior to construction. The O&M building is anticipated to be approximately 3,200 square feet and will contain an office for the onsite Plant Manager, a technician room, restroom, break room, locker room and shop area that will allow for the storage of equipment and tools necessary to operate and maintain the Project. This equipment will include a SCADA cabinet, spare solar panels, spare parts for the substation and equipment to operate the substation, as well as safety equipment for working with live electricity. A gravel or paved parking lot will be located adjacent to the O&M building and will have at least one parking spot per employee and additional room for deliveries. Caldwell has not finalized a location for the O&M building at this time.

Weather Stations

The Project will include up to 8 weather stations of up to 20 feet in height (see Figure 7 below). The weather stations will be located within the Project boundary, and their final locations will be determined following final engineering. The weather stations measure meteorological variables that have an impact on the facility’s performance and efficiency.

Figure 7 Weather Station

Temporary Facilities

Caldwell will use temporary laydown yards within the Project boundary. These yards will serve as both parking areas for construction personnel and staging areas for Project components during construction. The temporary laydown yards will total approximately 15 acres across the site. Caldwell has not finalized locations for the temporary laydown yards at this time. The temporary laydown yards may be located in permanently unbuilt areas within the Project boundary or in areas that will eventually be filled with panels or other generation equipment.