



# **HIGH RIVER ENERGY CENTER**

**Case No. 17-F-0597**

**1001.11 Exhibit 11**

**Preliminary Design Drawings**

## Contents

Exhibit 11: Preliminary Design Drawings .....	1
11(a) Site Plan .....	1
11(b) Construction Operations Plan .....	3
11(c) Grading and Erosion Control Plan .....	4
11(d) Landscaping Plan.....	5
11(e) Lighting Plan .....	5
11(f) Architectural Drawings .....	6
11(g) Design Detail Drawings of Underground and Overhead Facilities .....	6
11(h) Interconnection Facilities.....	7
11(i) Engineering Codes, Standards, and Guidelines .....	8
11(j) Wetland Boundaries.....	8
11(k) Site Plans including Vegetation, Ground Disturbance, and Wetlands.....	9

## Appendices

Appendix 11-1 Preliminary Design Drawings

## **Exhibit 11: Preliminary Design Drawings**

This Exhibit will track the requirements of proposed Stipulation 11, dated August 26, 2019, and therefore, the requirements of 16 NYCRR § 1001.11. This exhibit contains Preliminary Design Drawings and supporting documentation which were developed under the direction of a licensed Professional Engineer in the State of New York. The plans were prepared using AutoCAD Civil 3D design software and are generally presented at a scale of 1-inch equals 50 feet, with the exception of those intended to provide an overview of the Project Area. The drawings are labeled appropriately as “Preliminary – Not for Construction.”

The Project proposes to install fixed, tracker or a combination of both types of racking systems. As the technology is rapidly evolving for solar panel technology, and market conditions at the time procurement decisions need to be made are unknown at this time, the Applicant is proposing in this Application to evaluate both types of racking systems, with the final decision to be made and detailed in the Compliance Filing. The tracking and fixed array racking systems to be utilized would be similar to the Gamechange Solar Genius Tracker™ and the Gamechange Maxspan™ Pile Driven System, respectively, specification sheets of which has have been included as Appendix 2-2 and Appendix 2-3. Regardless of the type of array racking system ultimately selected for the Project, the Applicant intends to utilize a solar module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Diamond Cell. A specification sheet for this module has been included as Appendix 2-1. Only selected elements of the Project would change based upon the combination of array racking system types used, but all changes would be within the component fence line and to the same land uses shown in the Proposed Layout. The location of interior access roads and inverters, depending upon the final locations, could differ from that shown in the Exhibit 11 plans. Land coverage ratios will also be adjusted but they are not expected to be substantial or significant.

Accordingly, the drawings, plan, and maps required by Exhibit 11 depict a combination of both panel types, fixed and tracker. Approximately 50% of the panels are fixed and 50% are trackers. As part of the alternative layout evaluation, Exhibit 9 presents a site plan depicting all fixed panels.

### **11(a) Site Plan**

The Preliminary Design Drawings include a Site Plan for the Project, which depicts the following Project Components:

- (1) Solar panels and associated mounting features and inverters;
- (2) Access roads and parking areas (included as part of designated laydown areas);
- (3) Proposed grading, which includes locations for grading for permanent contours for final grading (no temporary grading is proposed);
- (4) Underground electric cable collection lines (number of circuits per route is indicated on the Civil Details drawings);
- (5) Approximate Limit of Disturbance (LOD) for all Project Components;
- (6) Vegetative clearing limits;
- (7) Indication of off-site permanent Right of Way (ROW), and road crossings for collection line installations;
- (8) Outline of collection substation and interconnection switchyard, including access roads, setbacks, and fence line;
- (9) Proposed locations of collection line crossings of streams, waterbodies, roads, and other relevant resource features; as well as proposed locations of trenchless methods of installation, including the approximate laydown areas, workspace, and trenchless installation details;
- (10) Project laydown areas which include staging, equipment storage areas, and designated parking areas;
- (11) Access areas for operation and maintenance (access roads are to be used for parking during operation by maintenance technicians). There are no proposed Operation and Maintenance (O&M) facilities, water supplies, or septic systems associated with the Project. Only the substation and switchyard control houses will require electricity (see Section 11(f) below);
- (12) Fencing and gates, including clearing associated with fencing;
- (13) Property lines and zoning setbacks;
- (14) Existing utility equipment locations and easement limits of those existing locations, including electric transmission and distribution lines, cable and telecommunication lines, and other features as applicable;
- (15) Site security features, including perimeter fencing.
- (16) Proposed planted screening locations are depicted in Appendix 11-1.

The “Overall Site Layout and Key Sheet” included as part of the Preliminary Design Drawings depicts the proposed locations of the solar arrays, access roads, collection lines, collection substation, laydown and staging areas, and other features as outlined above. The detailed Site

Plan and Grading & Drainage Plan drawings (1" = 50') show the proposed locations of Project Components relative to mapped streams and wetlands. Soil types and bedrock are depicted on Figures 21-2 and 21-3 in Exhibit 21 relative to Project Components. The Project Area lies outside the Special Flood Hazard Zone for the Mohawk River.

As solar technology is rapidly advancing, it is not possible to determine the exact module type that will be utilized for a project with a commercial operation date of 2021. However, the Applicant intends to utilize a module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Half Cell Module. A specification sheet for the modules has been included in Appendix 2-1. The Applicant is proposing the use of both tracking and fixed tilt array systems, both of which will be installed with minimal ground disturbance via driven posts. Aside from driven posts, the only foundations proposed for the Project will be concrete for select Components of the collection substation and the switchyard.

#### **11(b) Construction Operations Plan**

Specific details relating to construction and operation elements of the Project, such as project laydown areas, which includes staging, equipment storage, and parking areas, are included in the Preliminary Design Drawings. Material staging areas, construction equipment and worker parking areas (all included as part of designated laydown areas), and points of ingress and egress are shown on Drawings C-003 through C-029. Areas of excavation (for purposes of site grading) and conceptual soil storage areas are indicated on the Grading & Drainage Plan drawings. Final details relating to Project construction, including final locations of construction trailers/offices and concrete batch plant locations, as necessary, are not certain at this time as an Engineering, Procurement, and Construction (EPC) Contractor has not yet been selected for the Project. The construction trailers/offices will be located entirely within the currently indicated laydown areas for the Project. If necessary for Project construction, concrete batch plants will be located within either the indicated laydown areas or the substation yard.

During construction, the EPC will hire a contractor to plow snow off construction access roads as needed. Snow will be pushed off the access roads and windrowed at each respective edge of the road. The EPC will determine where to push and store snow based upon safety considerations and conditions encountered at that time.

### **11(c) Grading and Erosion Control Plan**

Soils information, site grading, stormwater management, and erosion control measures are shown on the Grading & Drainage Plans. These plans depict existing and proposed topography at 2-foot contour intervals. Existing topography was derived from a Light Detection and Ranging (LiDAR) survey contracted by the Applicant and completed in spring 2019. Soil types and boundaries were obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey database for Montgomery County, New York. Refer to Exhibit 21 for more detailed geotechnical information including boring reports, depth to bedrock, earthwork volume calculation, etc. Exhibit 21 also references a copy of the Geotechnical Engineering Report prepared by Terracon Consultants, which is also included as Appendix 21-1.

General areas of cut and fill are indicated on Grading & Drainage Plans and estimated cut and fill quantities have been detailed on in the Preliminary Design Drawings. Topsoil will be segregated from common fill (subsoils) and an agricultural monitor will be on-site during construction to oversee topsoil separation, as necessary. Additionally, the Applicant will comply with the New York State Department of Agriculture and Markets (NYSDAM) Guidelines for Agricultural Mitigation for Solar Energy Projects, revised in April of 2018, to the maximum extent practicable for requirements specific to construction, restoration, monitoring, and decommissioning. Thus, topsoil anticipated to be stripped will be stripped, graded, replaced, and revegetated to further minimize impacts to agricultural areas. No retaining walls will be necessary during construction.

A Preliminary Stormwater Pollution Prevention Plan (SWPPP) has been included in Appendix 23-3. The preliminary design conforms to the requirements of the New York State Stormwater Management Design Manual (2015). The erosion and sediment control measures shown on the plans have been designed in conformance with the New York State Standards and Specifications for Erosion and Sediment Control (2016). No stormwater impacts are anticipated to occur as a result of the Project and construction activities will comply with the requirements of the New York State Pollution Discharges Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-015-002, or that in effect at time of construction). Anticipated erosion and sediment controls and stormwater management practices (SMPs) have been detailed in the SWPPP and the Preliminary Design Drawings. A Final SWPPP will be prepared to detail the proposed post-construction stormwater control practices and the stormwater design calculations. The Final SWPPP will be included as part of the Compliance Filing.

#### **11(d) Landscaping Plan**

Landscape Screening Plan drawings have been prepared to depict proposed landscaping. An overall landscape screening plan indicates the location of proposed vegetative screening in relation to Project Components and adjacent sensitive receptors. A Landscape Screening Plan Typical Notes and Details drawing has been prepared to provide general planting notes, details on plantings and to identify and quantify the types of tree and shrub species that are proposed. Additionally, a seed mix for the grass type to be planted within the solar array is included in this drawing. Finally, a Land Screening Plan Screening Scenarios drawings has been prepared to illustrate the two different types of landscape screenings that are being proposed.

The limits of clearing existing trees are shown on the Site Plan and Grading & Drainage Plan drawings. Clearing is kept to the minimum needed for construction and to prevent shading.

Similar to other projects in New York and in regions that receive snow accumulations, the Applicant intends to hire a local contractor to plow access roads across the Project. Snow will be pushed off the permanent access roads and windrowed at each respective edge of the road. The Operation & Maintenance personnel will determine where to push and store snow based upon safety considerations and conditions encountered at that time.

#### **11(e) Lighting Plan**

Lighting is only proposed at the Project interconnection facilities and is only for security, safety, and maintenance purposes; no lighting is proposed within the solar arrays. Details regarding the Project's Lighting Plan are included in the Preliminary Design Drawings in Appendix 11-1. Manually-operated security lighting is proposed at the collection substation and switchyard. A lighting plan for the collection substation and switchyard is included with the Exhibit 11 drawings. This plan was developed to minimize fugitive light while meeting lighting standards established by the National Electric Safety Code (NESC). The collection substation and switchyard will normally be unoccupied. At the perimeter of the interconnection facilities, lighting will be turned on manually by a switch. In work areas, lighting will be activated manually turned on by a switch. Lighting will be installed facing downward to minimize potential impacts to the surrounding public. Lighting has been designed to provide a 3.0 foot-candle average, to eliminate unnecessary light trespass beyond the collection substation and switchyard and will be equipment or pole structure mounted. During unoccupied periods, lighting will not be illuminated. The collection substation

and switchyard will use full cut-off fixtures, no drop-down optics, and task lighting wherever feasible, specified in the Lighting Plan.

#### **11(f) Architectural Drawings**

There are no habitable buildings proposed as part of the Project. The Preliminary Design Drawings include cross-sections of the collection substation and Point of Interconnection (POI) switchyard interconnection equipment, as well as fencing and relevant site security features. These drawings identify the arrangement of the previously noted features, as well as the length, width, height, material of construction, color and finish of relevant Components, and the type of fencing to be installed around Project Components. Additionally, a floor plan and interior lighting plan for the proposed collection substation and switchyard control rooms have been included. As noted above, the control rooms are not habitable structures and they do not require running water and are not meant for human occupation.

#### **11(g) Design Detail Drawings of Underground and Overhead Facilities**

The Preliminary Design Drawings and various appendices of the Application contain typical design details associated with the Project, including the proposed depth and level of cover for buried collection lines and overhead interconnection facilities indicating height above grade, descriptions and preliminary specifications of all major Components. The following information will also be included, as applicable:

- (1) Collection lines for the Project will be installed underground. The Preliminary Design Drawings include the following Components regarding underground installations:
  - (i) Single and multiple-circuit layouts;
  - (ii) Co-located installations with dimensions of proposed depth and level of cover;
  - (iii) Separation requirements between circuits;
  - (iv) Clearing width limits for construction; and
  - (v) Operation of the facility, limits of disturbance, and required permanent ROW.



- (2) The only overhead line proposed for the Project is the approximately 500-foot transmission line connecting POI switchyard to the existing transmission line. The Preliminary Design Drawings include the following Components regarding aboveground installations:
- (i) Elevation plans for overhead facilities (collection and transmission lines) including height above grade, structure layouts, clearing width limits for construction and operation of the facility, and permanent ROW widths;
  - (ii) Average span lengths for each proposed layout; and
  - (iii) Structure separation requirements (for installations containing more than one pole, etc.) for all single and multiple-circuit layouts.
- (3) The solar arrays will be fastened to posts driven into the ground. Typical details of the post installation have been provided on Sheet C-069 of the Civil Drawing Set within the Preliminary Design Drawings.
- (4) A circuit map indicating overhead and underground installations, and number of required circuits proposed per collection line run is included in the Collection System Drawing Set within the Preliminary Design Drawings.
- (5) A typical collector trench and typical details associated with trenchless installations including typical staging areas, construction machinery arrangements, and bore pits are identified on the Preliminary Design Drawings; Final arrangements of these details will be determined in the Compliance Filings; and
- (6) Technical data sheets associated with solar panels representative of those to be used for this Project have been provided in Appendix 2-1.

#### **11(h) Interconnection Facilities**

For the interconnection facilities, the plans and drawings required by subsections (a)–(g) have been included in Appendix 11-1 of the Application, as well as a profile of the centerline of the overhead interconnection line at an exaggerated vertical scale.

### **11(i) Engineering Codes, Standards, and Guidelines**

Below is a detailed list of engineering codes, standards, guidelines, and practices that the Applicant intends to conform to during the planning, designing, construction, and operation of the Project electric collection substation, POI switchyard, and associated structures, as applicable:

- American National Standards Institute (ANSI)
- Institute of Electrical and Electronics Engineers (IEEE)
- Insulated Cable Engineers Association (ICEA)
- American Society of Mechanical Engineers
- National Electric Code (NEC)
- National Electrical Safety Code (NESC)
- National Electric Manufacturers Association
- National Fire Protection Association (NFPA)
- Uniform Building Code
- United Laboratories
- American Iron and Steel Institute
- American Institute of Steel Construction
- International Building Code 2006
- American Association of State Highway and Transportation Officials (AASHTO) Standard for Aggregates
- American Society of Civil Engineers (ASCE) 7-10 Minimum Design Loads for Buildings and Other Structures
- Federal Occupational Safety and Health Administration (OSHA) 1910.269
- American Concrete Institute (ACI)

### **11(j) Wetland Boundaries**

Wetlands identified within the Project Area are referred to as “delineated wetlands.” The boundaries of delineated wetlands were recorded with a Trimble Geo 7000 XH Global Positioning System (GPS) unit with reported sub-meter accuracy or a Juniper Geode GPS/Global Navigation Satellite System (GLONASS) Sub-meter Receiver. See Section 22(i)(1) and Appendix 22-5 for a detailed description of how these delineated wetlands were identified within the Project Area.

Wetlands and adjacent areas were estimated within 500 feet of the limits of disturbance on parcels the Applicant does not have control over. These wetlands identified outside the Project Area are

referred to as “predicted wetlands.” See section 22(i)(2) for a detailed description of how these predicted wetlands and adjacent areas were interpolated.

The Preliminary Design Drawings depict both delineated wetlands and predicted wetlands. See Figure 22-3 depicting delineated wetlands within the Project Area and subsequent 500-foot area from the limits of disturbance. Shapefiles provided to the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Public Service (NYS DPS) with the Application include delineated wetlands and predicted wetlands.

#### **11(k) Site Plans including Vegetation, Ground Disturbance, and Wetlands**

As referenced above, the Preliminary Design Drawings depict all Project Components; proposed grade changes and conceptual locations for stockpile areas; the limits of ground disturbance and vegetative clearing; and all field-delineated wetlands, predicted wetland boundaries and New York State (NYS) regulated 100-foot adjacent areas and NYS regulated wetlands located within 500 feet of all areas to be disturbed by construction.