ATTACHMENT DB-2

New Market Solar

Civil Basis of Design – 30%

Prepared for:

McCarthy Building Companies, Inc.
6225 N 24th St. Suite 200
Phoenix, AZ 85016

Location:
Highland County

December 21st, 2020

EVS Project No.: 2020-189.1

Table of Contents

1.0 Summary

New Market Solar – 100 MW AC Civil Basis of Design Summary		
Existing Conditions		
Local Jurisdiction	Highland County	
Property Size	1120 acres	From ALTA survey
Current Land Use	Tilled agriculture	Aerial imaging & geotechnical report
Ground Coverage at Start of Construction	Bare earth where farmed. Native grass elsewhere.	Aerial imaging
Soil Type	Primarily lean clay	Provided Preliminary Geotechnical Evaluation Reports prepared by Terracon Consultants, Inc. dated 12/11/2020.
Topsoil Thickness	6 inches	Provided Geotechnical Evaluation Report prepared by Terracon Consultants, Inc. dated 12/11/2020.
Infiltration Rate	0.02 in/hr	Per Ohio EPA Design Infiltration rates (Silty Clay)
Groundwater	6.5 – 19 feet in 7/10 borings	Provided Geotechnical Evaluation Report prepared by Terracon Consultants, Inc. dated 12/11/2020.
Drain tile	Unknown	No existing drain tile information has been provided
Proposed Conditions		
Access Road Width	20 feet ag-ag edge	Weekly 12.15.2020 Meeting McCarthy requests 20' wide road.
Access Road Section	8 in. of aggregate that meets a minimum CBR value of 3 and ODOT CMS 304 gradation requirements.	Provided Geotechnical Evaluation Report prepared by Terracon Consultants, Inc. dated 12/11/2020 with 2.5-inch allowable ruts.
Ground Cover	Native Grass	Owner provided scope of work document titled, "Exhibit C – Scope of Work".doc
Min Inside Curve Radius	40 feet	Per owner provided scope of work document titled, "Exhibit C – Scope of Work".doc, roads will be designed to accommodate loading of HS-20-44 from public road encroachment.
Property Line Setbacks	See narrative	From Highland County Conveyance Standards

Perimeter Fence	6 foot chain-link topped with 1 foot of 3-strand barbed wire	Owner provided scope of work document titled, "Exhibit C – Scope of Work".doc
Grading Restrictions	40%	Limits provided by racking manufacturer
Pile Reveal Grading Restrictions	X'-Y'	Owner/Client input required.
Stormwater	Shallow stormwater basins	Ohio EPA water quality treatment requirement

2.0 Project Description

2.1 Background

New Market Solar is a ground mounted 100 MW AC photovoltaic solar project located in Whiteoak Township, Highland County, Ohio. The project will require aggregate access roads into the site, security fencing with gates, and a moderate amount of site grading and stormwater management.

2.2 Site Fence

The perimeter of the site is fenced with a 6-foot-high chain link security fence topped with three strands of barbed wire. gates across the access road are 20-foot-wide manual swinging gates.

2.3 Setbacks

Property line setbacks are shown in the table below. The source of data for these setbacks is Highland County Conveyance Standards.

LOCATION		EQUIPMENT SETBACK	COMMENTS
SIDE & REAR	Various locations throughout site	10'	
Arterial Street	None around project site	50'	
Collector Street	Various locations throughout site	45'	
Local Street	None around project site	40'	

3.0 Existing Conditions

3.1 Site Description

The existing property is 1120 acres of agricultural land currently used as cropland. The proposed solar project will use approximately 553 acres of the 1120 acres. The site is predominately agricultural crop land with some wooded areas. 2 small wetlands and 3 small stretches of jurisdictional streams were delineated within the extents of our project area.

3.2 Topography

The site is relatively flat with on-site slopes very rarely exceeding 1% with most of it around 0.5%. Most of the site is sloping overall North to South and towards existing drainage swales that bisect existing agricultural plots as well as roadside ditches in some instances. The elevation onsite ranges from 1039 feet to 1005 feet.

3.3 Drain Tile

No draintile information has been provided.

3.4 Soils

The general soil profile at the site consists of 6 inch of topsoil over glacial till deposits consisting of stiff, lean clay. Depth to groundwater ranges from 6 to 28 feet below ground surface and was observed in 21 of 40 borings.

4.0 Site Access and Roadways

Access to the site is provided by West New Market Road and Hollowtown South Road. Internal site access roads consist of 20-foot-wide aggregate roads that provide access to the equipment pad locations and point of interconnection. Internal roads are designed with a 40-foot minimum inside turning radius and hammerhead turns at dead ends to accommodate ingress and egress of a HS-20-44 truck.

The geotechnical engineer's report recommends 8 inches of base course aggregate that meets a minimum CBR value of 3 and ODOT CMS 304 gradation requirements on top of 12 inches of subgrade compacted to 98% maximum dry density based on the standard Proctor test to accommodate construction traffic and ongoing maintenance vehicles. For areas with frequent subgrade saturation, a woven geotextile is recommended by the geotechnical report to be placed below the aggregate base. Equipment pads will be prepared by stripping topsoil, compacting suitable subgrade, and placing engineered fill, approved by geotechnical engineer, to final subgrade elevation, as necessary.

5.0 Site Grading

The principle functions of site grading for this project are to:

- Promote drainage off site in a way that protects the solar equipment and mimics existing drainage patterns to the extent possible.
- Create effective slope and elevation for roadways (typical 2% crown or cross slope)
- Reduce slopes where necessary to accommodate racking limitations. The selected racking system is Solar Flex Rack, which has a maximum allowable slope of 40% along the module rows.
- Reduce undulations within each tracker row to allow for the installation of the tracker torque tube on a plane. The acceptable pile reveal window is: x'-y'

While accomplishing the above functions, the goal is to reduce earthwork quantity to the extent possible. This is done by matching road elevations to existing grade elevations wherever possible, allowing runoff to sheet drain over roads, and minimizing the use of roadside ditches and storm sewer. In addition to reducing overall earthwork quantity, another goal is to balance earthwork on the site and eliminate the need for import or export of soil.

6.0 Stormwater Management

6.1 Jurisdictional Requirements

6.1.1 Highland County

Highland County does not have zoning or permit requirements related to stormwater management. EVS deferred to the Ohio EPA General Construction Permit requirements.

6.1.2 Ohio Environmental Protection Agency

The Ohio EPA has jurisdiction to enforce the National Pollution Discharge Elimination System permit for erosion control during construction. The NPDES permit has a water quality volume requirement that must be met through capture and treatment. The Ohio Construction General Permit outlines the equations needed to calculate water quality volume and drawdown times (Equation 1 pg. 21 Ohio EPA Permit No.: OHC000005).

6.2 Stormwater Design

To meet the requirements of the Ohio EPA, vegetation is established throughout the site below solar modules, reducing the post construction rate and volume of proposed site condition runoff. Ohio EPA allows for no permanent stormwater basins to be used if the development follows procedures on topsoil replacement. The proposed site will use the topsoil replacement as well as buffer strips equal to the width of the road to slow and treat runoff.

7.0 Erosion Control

7.1 Construction Phase

Erosion control during construction follows the guidance of the Ohio EPA Rainwater and Land Development Manual chapter 5 and 6, which covers Temporary Runoff Control and Sediment Control respectively. These two chapters covers several EPA approved BMP's that will be utilized during the construction of New Market Solar, including, sediment basins, silt fencing, filter socks, water bars, rock check dams, and stream crossings. This is all done to adhere to the National Pollution Discharge Elimination System (NPDES) Construction General Permit, which is administered by the Ohio Environmental Protection Agency (Ohio EPA). EVS will propose to implement sediment control basins with a volume of 1,000 cubic feet for every disturbed acre.

7.2 Post-Construction Phase

Permanent erosion control is accomplished primarily by establishing vegetation throughout the site to stabilize the soil. A native grass seed mixture is placed on all non-improved site surfaces. The selected seed mixture is for a short grass that will not interfere with the performance of the solar panels and will not require maintenance once established.

8.0 Permits

The following list of permits required for the project is subject to change:

- A Construction General Permit of the National Pollution Discharge Elimination System to comply with Ohio and Federal EPA regulations.
- A driveway culvert permit from Highland County.

Summary: Text Attachment DB-2 to the Direct Testimony of Dan Bowar electronically filed by Mr. Robert Dove on behalf of EVS, Inc. .