



## **Ross County Solar**

### **Exhibit M**

## **Route Evaluation Study and Traffic Control Plan**

**Case No. 20-1380-EL-BGN**

# **ROUTE EVALUATION STUDY**

FOR THE:  
**ROSS COUNTY SOLAR PROJECT**  
**ROSS COUNTY, OHIO**

PREPARED FOR:  
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**SEPTEMBER 2020**

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## 1.0 INTRODUCTION

### 1.1 Project Description and Purpose

This Route Evaluation Study has been prepared for Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. on behalf of Ross County Solar, LLC, who is planning development of the Ross County Solar Project, an up to 120-megawatt AC (MW<sub>AC</sub>) utility-scale solar electric generation facility (Facility). The Ross County Solar Project is planned to include solar panel arrays and setbacks, along with associated infrastructure such as a fenceline, below-ground or hybrid electrical collection lines, inverters, access roads, substation, operations and maintenance (O&M) building, weather stations, and laydown yards. The project is located in Buckskin and Paint Townships in Ross County, Ohio. The overall Project Area is approximately 1,430 acres. A Project Map is included in Appendix A.

The objective of this study is to support an application to the Ohio Power Siting Board (OPSB) for a Certification of Environmental Compatibility and Public Need (Certificate Application), as codified at Ohio Administrative Code (OAC) 4906, as follows:

1. OAC 4906-4-06(F)(3): The applicant shall evaluate and describe the anticipated impact to roads and bridges associated with construction vehicles and equipment delivery. Describe measures that will be taken to improve inadequate roads and repair roads and bridges to at least the condition present prior to the project.
2. OAC 4906-4-06(F)(4): The applicant shall list all transportation permits required for construction and operation of the project and describe any necessary coordination with appropriate authorities for temporary or permanent road closures, lane closures, road access restrictions, and traffic control necessary for construction and operation of the proposed facility.

For the purpose of this report, the following definitions have been used when describing the project (based on OAC 4906-1-01):

- **Project Area** means all land within a contiguous geographic boundary that contains the facility, associated setbacks, and properties under lease or agreement that contain any components of the facility.
- **Facility** means the proposed major utility facility and all associated facilities.
- **Associated Facility** means, for an electric power generation plant or wind farm: rights-of-way, land, permanent access roads, structures, tanks, distribution lines and substations necessary to interconnect the facility to the electric grid, water lines, pollution control equipment, and other equipment used for the generation of electricity.



## **1.2 Methodology**

Access to the Facility will be from State, county and township roads and, where necessary, new private gravel access roads. Construction of the Facility will cause temporary increases in truck traffic on area roadways due to the delivery of materials and equipment.

This evaluation identifies the probable public routes that can be used to construct and operate the Facility. It is assumed that vehicle traffic will originate from an Interstate or 4-lane divided State highway. From these routes, 2-lane State highways will be used to travel to the Project Area. State, county and township roads will be used as primary access to the Project Area.

For purposes of this evaluation, Interstate, 4-lane and 2-lane State highways were not evaluated because it is assumed that these roadways are sufficient to accommodate the construction and operational traffic with respect to load capacity, geometry and condition.

For the county and township roads, this evaluation includes a desktop study and on-site visual assessment of the probable routes, bridges and culverts in the Project Area. This evaluation includes the general condition based on visual assessment of culverts and bridges, general pavement conditions, vertical changes in grade, and overhead height obstructions. A pavement condition index survey was not completed. The evaluation identifies locations where improvements to the road are likely to accommodate the size of the delivery and construction vehicles, if needed. Research for state permits that are necessary for hauling the materials and equipment is also included in the evaluation. Video was collected from all the reviewed probable routes as well as photographs of select features noted during the evaluation.

## **1.3 Vehicle Types**

The size and types of vehicles needed to deliver construction equipment, construction materials and Facility components include flatbed or tractor-trailer equipment delivery vehicles and multi-axle dump trucks. In addition, typical automobiles and pickup trucks will be used to transport construction staff and other incidental truck trips.

## **1.4 Design Vehicle Characteristics**

Transportation of construction equipment and materials and Facility components will be completed using conventional transportation vehicles such as fixed-bed trucks or tractor-semi-trailers (AASHTO WB-50). Construction equipment such as excavators, bull dozers, and wheel tractor-scrapers will be transported to the site on fixed-bed or tractor-semi-trailer low-boy vehicles. Multi-axle dump trucks may also be used. The vast majority of vehicles will be below the maximum allowable size and weight. Some limited components

such as switchgear or transformers for switchyards and substations may require the use of overweight/oversize vehicles.

## 2.0 PROBABLE ROUTE EVALUATION

### 2.1 Roadway Characteristics

An evaluation and visual assessment of the probable routes were conducted on July 9, 10, and 13, 2020 by traveling the roadways listed below (see Appendix A for location of probable routes). Existing data on traffic volumes for the probable routes was obtained from the Ohio Department of Transportation (ODOT) Traffic Monitoring Management System (TMMS).<sup>1</sup> The Annual Average Daily Traffic (AADT) was obtained for each probable route road segment, if available. A detailed roadway capacity analysis was not completed for this study. Based on field observations and the AADT (which is relatively low and consistent with rural areas), we do not expect construction or operation of the Facility to create any significant delays to the traveling public. Table 1 summarizes the existing conditions of the roadways.

**TABLE 1  
ROADWAY CHARACTERISTICS**

| Road                   | From              | To                     | Pavement Width (ft)          | No. of Lanes | Pavement Condition                | Surface Type | AADT | Speed Limit |
|------------------------|-------------------|------------------------|------------------------------|--------------|-----------------------------------|--------------|------|-------------|
| Lower Twin Road (CR54) | SR41              | Rapid Forge Road (CR1) | Varies from 17'-0" to 18'-6" | 2            | Fair                              | Asphalt      | N/A  | NP          |
| Rolfe Road             | SR41              | Rapid Forge Road (CR1) | 12'-6"                       | 1.5          | Fair                              | Asphalt      | N/A  | NP          |
| Moxley Road (CR9)      | SR41              | Rapid Forge Road (CR1) | 20'-0"                       | 2            | Fair – E. Half;<br>Good – W. Half | Asphalt      | 116  | NP          |
| Rapid Forge Road (CR1) | Moxley Road (CR9) | Project Boundary       | Varies from 21'-6" to 20'-0" | 2            | Fair                              | Asphalt      | 655  | NP          |

Notes:

AADT – Annual Average Daily Traffic (2019)

NP – not posted

N/A – not available

Lanes are assumed to be a minimum of 8.5 feet wide

Pavement Condition:

Excellent – recently paved.

Good – pavement appears stable with minor cracking and other pavement distress indicators.

<sup>1</sup> Ohio Department of Transportation, Traffic Monitoring Management System, <http://odot.ms2soft.com/>

Fair – pavement appears stable but may have a higher amount of transverse and longitudinal cracking and other distressed pavement indicators such as edge cracking, rutting, and weathering. Potholes may be present.

Poor – pavement is severely distressed with excessive cracks, potholes, rutting, and deterioration.

#### ***Lower Twin Road***

This road is in fair condition and exhibits advanced aging with some visible pavement repairs (patching). There is some transverse and longitudinal pavement cracking along the entire road segment with periodic potholes and transverse cracking over culverts. Some segments of the road have edge cracking/failure and some areas exhibit alligator cracking. This road has a faded centerline and no edge striping. The road has relatively flat grades with no abrupt grade changes.

#### ***Rolfe Road***

This road is in fair condition and exhibits normal aging with routine maintenance and some visible pavement repairs (patching). This road exhibits moderate edge cracking, locations with transverse and longitudinal cracking, and transverse cracking and depressions over culverts. This road does not have any striping. The road has relatively flat grades with no abrupt grade changes.

#### ***Moxley Road***

The western portion of this road is in good condition and exhibits advanced aging with some visible pavement repairs (patching). This road exhibits moderate edge cracking, locations with transverse and longitudinal cracking, and transverse cracking over culverts.

The eastern portion of this road is fair condition with minor pavement cracking. The road narrows to 16'-0" over Bridge No. 7130554.

This road does not have any striping. The western portion of this road has relatively flat grades with no abrupt grade changes. The eastern portion of this road has moderate grade changes with a moderate grade change over Bridge No. 7130554.

#### ***Rapid Forge Road***

This road is in fair condition and exhibits advanced aging with some visible pavement repairs (patching). There is some transverse and longitudinal pavement cracking along the entire road segment with periodic potholes and transverse cracking over culverts. Some segments of the road have edge cracking/failure and some areas exhibit alligator cracking. There is limited roadway shoulder on one portion of the road and

embankment erosion on another portion of the road. This road has a centerline and faded edge striping. The road has moderate grades with no abrupt grade changes.

### ***Summary***

All of these roads can be used for equipment delivery and construction traffic in their current condition with the exception of Rolfe Road. The use of Rolfe Road under its current condition and width is not advised, and should its use be necessary for deliveries or construction traffic, improvements are recommended.

Example areas of concern for all the roads were photographed and are included in Appendix B.

## **2.2 Bridge and Road Load Restrictions**

There were no signs posting load restrictions for roads in the Project Area.

There are three bridges on the Probable Routes in the Project Area:

Bridge No. 7130570 is a concrete structure on Limestone block abutments. The bridge and abutments are in good condition. There is some embankment erosion by the south side of the eastern abutment.

Bridge No. 71305554 is a galvanized steel structure on concrete abutments. The bridge and abutments are in good condition. There is some embankment erosion by the north side of the western abutment.

Bridge No. 7130279 is a galvanized corrugated metal pipe arch. The corrugated metal pipe is in good condition.

The Ross County Engineer's office was contacted to determine if there are any restrictions on bridges and roadways on the routes that were evaluated. The Ross County Engineer's office provided the following information for the Probable Routes identified in this report<sup>2</sup>:

1. All the road segments are open to legal loads.
2. The Lower Twin Road section should be scheduled for resurfacing in 2021 or 2022. Flaggers will be used, and the road kept open. This project should take no more than 2 days.
3. Moxley Road should be scheduled for resurfacing in 2021 or 2022. The road is narrow and will be closed during working hours. This project should take no more than 2 days.

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<sup>2</sup> Ross County Engineer, Charlie Ortman, P.E., P.S. via email, September 23, 2020.

4. At this time, none of the other roads are scheduled for resurfacing. If they do get scheduled, they would probably be kept open and traffic will be maintained with flaggers.
5. If any culverts need replaced as a result of our regular inspections; most only take one day. If larger ones need replaced, then it can extend to a week or two.

### **2.3 Culvert Characteristics**

Culverts (where visible) were visually examined to determine its condition and if adequate cover is present. For purposes of this evaluation, adequate cover means there is more than one foot of cover over the culvert (inclusive of the pavement). The condition of the culvert was limited to a visual review to determine if there is distortion in the shape (e.g., out of round) or evidence of corrosion (for steel culverts). The condition of concrete culverts is limited to evidence of cracking or surface spalling.

#### ***Lower Twin Road***

There were five HDPE and one CMP culvert noted on this road. All the culverts were in good condition and had stable embankments. The pavement was in good condition over three of the culverts and in fair condition (transverse cracking) over the other three culverts.

#### ***Rolfe Road***

There were five HDPE culverts and one CMP culvert noted on this road. All the culverts were in good condition and all had stable embankments except one. The pavement was in good condition over three of the culverts and in fair condition (transverse cracking) over the other three culverts.

#### ***Moxley Road***

There was one HDPE culverts and one CMP culvert noted on this road. All the culverts were in good condition. The HDPE culvert had some embankment erosion. The pavement was in good condition over these culverts.

#### ***Rapid Forge Road***

There were six HDPE culverts noted on this road. All the culverts were in good condition and had stable embankments. The pavement was in good condition over two of the culverts and in fair condition (transverse cracking) over the other four culverts.

### **2.4 Overhead and Width Restrictions**

The roads were also investigated for height limitations. Permanent structures that cross over the road and restrict the clearance for oversized loads (such as bridges and overpasses) were not found along the evaluated routes. For overhead cables, the national standard for minimum clearance over roads is 15.5 feet, and cables cross over the studied routes in numerous locations. The height of the cables was not

measured; however, there were no overhead cables that appeared to be obstructive. In the event a cable presents an obstruction, utility providers can temporarily or permanently raise the cables and/or move the poles. Therefore, cables should not be a limiting feature for use of the roads.

## **2.5 Posted Caution Signs**

There were no posted caution signs on the roadways that were reviewed.

## **2.6 Local School and Public Transportation Information**

The Facility is located in Ross County and the Greenfield Exempted Village School District. The following information was obtained from the Ohio Educational Directory System (OEDS) Website:<sup>3</sup>

**Greenfield Exempted Village School District** (updated as of August 2016):

### Elementary Schools

Buckskin Elementary

4297 Broadway

South Salem, Ohio 45681

K-5 – enrollment 299 students

Greenfield Elementary

200 North Fifth Street

Greenfield, Ohio 45123

K-5 – enrollment 470 students

Rainsboro Elementary

12916 Barrett Mill Road

Bainbridge, Ohio 45612

K-5 – enrollment 294 students

### Greenfield Middle School

200 North Fifth Street

Greenfield, Ohio 45123

6-8 – enrollment 566 students

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<sup>3</sup> Ohio Educational Directory System (OEDS) Website, <http://oeds.ode.state.oh.us>.

McClain High School

200 North Fifth Street

Greenfield, Ohio 45123

9-12 – enrollment 678 students

All of these school buildings are at least 2 miles from the Project Area. Due to the rural area, many of the students are transported by bus. The number of buses and stops within the Project Area would be limited due to the total number of students and low density of homes. Impacts to school bus routes would be minimal based on:

1. No planned road closings;
2. Many project deliveries would occur in the middle of the day; and
3. Wide loads requiring escorts are negligible.

There are no rail or bus public transit systems in the Project Area.



### **3.0 POTENTIAL IMPACTS TO ROADWAYS**

The development of a solar electric generating facility has the potential to create transportation impacts because of short-term construction activities. The following sections estimate the traffic for construction vehicles during the project, summarize permitting and road use agreements, and outline steps for mitigating potential impacts to roadways.

#### **3.1 Estimated Future Traffic**

To deliver the construction equipment, materials and construction workers during the construction of the Facility, the probable routes will experience increased truck traffic. Historic data for construction of solar electric generating facilities indicate that there are approximately 17 to 18 vehicles per MW of power. This project is projected to be 120 MW; therefore, an estimated 2,040 to 2,160 vehicles for the project.

The vast majority of vehicles will be below the maximum allowable size and weight. Some limited components such as switchgear or transformers for switchyards and substations may require the use of overweight/oversize vehicles.

A final delivery route has not yet been finalized, but it is likely that delivery of Facility components to the Project Area will be from the north by way of US35 to SR753 to SR41 that is adjacent to the east side of the Project Area. An alternate route would be from the south by way of US50 to SR41. Within the Project Area, county and township roads and new private gravel access roads will likely be used to deliver equipment and materials. The probable routes are shown on Figure 1 in Appendix A.

For the delivery vehicles that are below the maximum allowable size and weight, no delays to local traffic should be experienced except where the delivery vehicles may need to travel on narrow roadways (less than 2 lanes in width). When delivery vehicles are travelling on narrow roadways or when there is an occasional oversized vehicle, traffic control will be utilized to manage local traffic. However, the delays to local traffic should be minimal due to the low traffic volume in the Project Area. Because this is an agricultural area, heavier use of roadways by local farmers during planting and harvest seasons will occur. Prior to construction, a Traffic Control Plan will be prepared that describes the procedures that will be used to manage traffic during construction.

Potential access locations to the Project Area along the probable routes were identified during the evaluation (see Appendix A). These locations are based on the location of existing driveways on the parcels. In the event existing driveways were not present, the potential access locations were noted where a driveway could be located based on lack of obstructions and relatively flat topography. Due to the relatively flat

topography in the Project Area, many other locations are possible along the probable routes. Final driveway locations should take into consideration the final Facility layout, location with respect to other driveways and roadways, topography and vertical and horizontal sight distance.

During operation and maintenance of the Facility, there will be very little increase in traffic, as solar electric generation facilities require minimal staffing to accommodate daily operations and maintenance. There will be occasional maintenance vehicles and additional traffic will be negligible.

### **3.2 Permits and Agreements**

Prior to construction, the contractor will obtain all necessary permits from ODOT and the County Engineer. The County Engineer may require a Road Use and Maintenance Agreement (RUMA) for construction activities. This agreement would include procedures for temporary road closures, lane closures, road access restrictions and traffic control. For driveway access on County roads, a permit will be required from the County Engineer.

Road and County-maintained ditch crossings (e.g., underground or overhead collection and transmission lines) will require a permit from ODOT or the County Engineer.

Special Hauling Permits are required when loads exceed maximum dimensions or weights. Table 2 summarizes the characteristics of vehicle characteristics without Special Hauling Permits for State of Ohio highways.

For construction of the Facility, the vast majority of the vehicles will be below current maximum dimensions and weights. Therefore, Special Hauling Permits are only anticipated for a few vehicles that may exceed these criteria such as switchgear or transformers.

**TABLE 2**  
**DIMENSIONAL CRITERIA FOR VEHICLES WITHOUT SPECIAL HAULING PERMITS**

| <b>Vehicle Characteristic</b>                           | <b>State Highway Limit</b> |
|---|----------------------------|
| <b>Width</b> of vehicle, inclusive of load              | 8.5 Feet                   |
| <b>Height</b> of vehicle, inclusive of load             | 13.5 Feet                  |
| <b>Length</b> of vehicle, inclusive of load and bumpers | 85 Feet                    |
| <b>Total Weight</b> of vehicle with 3 or more axles     | 80,000 Pounds              |

### **3.3 Proposed Mitigation**

This study has determined that very little impact to roads associated with construction vehicles and material delivery is anticipated during the project. Final civil engineering design will be necessary prior to construction to ensure all transportation related activities are accounted for and approved by the County Engineer.

All roads should be monitored during construction for deterioration to ensure they are safe for local traffic. The volume and/or weight of construction traffic may cause accelerated pavement deterioration or stress on drainage structures that could necessitate temporary repairs. After completion of construction activities, there may be improvements required to return the roadways and drainage structures to pre-construction conditions. These requirements will be outlined in the RUMA with the County Engineer.

In the event impacts do occur, the following mitigation techniques will be utilized to avoid or minimize transportation-related impacts and/or to provide long-term improvement to the local road system:

#### **3.3.1 Insufficient Roadway Width**

- Rerouting over-width vehicles to wider roadways.

#### **3.3.2 Insufficient Vertical Clearance**

- Temporarily raising overhead utility lines.
- Rerouting over-height vehicles to roadways with sufficient vertical clearance.

#### **3.3.3 Poor Pavement Condition or Insufficient Pavement Durability**

- Roadside drainage improvements
- Pavement Patching
- Replacing pavement prior to construction (may include subgrade improvements).
- Replacing pavement during or after construction if damaged by construction traffic (may include subgrade improvements).
- Rerouting heavy-loaded vehicles to avoid insufficient pavement.

#### **3.3.4 Insufficient Cover over Drainage Structures**

- Adding temporary gravel and/or asphalt cover over structures.
- Using bridge jumpers to clear structures.
- Replacing structures during or after construction if damaged by construction traffic.
- Rerouting heavy-loaded vehicles to avoid structures.

#### **3.3.5 Poor Structure Condition**

- Replacing structure during or after construction if damaged by construction traffic.
- Using bridge jumpers to clear structures.
- Rerouting heavy-loaded vehicles to avoid structures.

#### **3.3.6 Inadequate Bridge Capacity**

- Using bridge jumpers to clear bridges.
- Rerouting heavy-loaded vehicles to avoid bridges.

#### **3.3.7 Insufficient Roadway Geometry**

- Rerouting over-sized vehicles to avoid insufficient roadway geometry.
- Profile adjustments to roadways with insufficient vertical geometry.
- Permanent or temporary plan adjustments to roadways with insufficient horizontal geometry.

## 4.0 CONCLUSIONS

Based on information collected during the field investigation, vehicle assumptions, and information available from ODOT and the County Engineer, sufficient infrastructure exists via Interstate, State and local roads to construct the Facility. The vast majority of the vehicles transporting construction equipment, materials and workers are expected to be below load and dimensional limits. Some limited components such as switchgear or transformers for switchyards and substations may require overweight and/or oversize vehicles.

In the event overweight and/or oversized loads are necessary for construction, Special Hauling Permits will be obtained from the Ohio Department of Transportation (ODOT). All work will be coordinated and approved by the appropriate regulatory agencies prior to delivery.

For the delivery vehicles that are below the maximum allowable size and weight, no delays to local traffic should be experienced except where the delivery vehicles may need to travel on narrow roadways. When delivery vehicles are travelling on narrow roadways or when there is an occasional oversized vehicle, traffic control will be utilized to manage local traffic. However, the delays to local traffic should be minimal due to the low traffic volume in the Project Area. Because this is an agricultural area, heavier use of roadways by local farmers during planting and harvest seasons will occur. Prior to construction, a Traffic Control Plan will be prepared that describes the procedures that will be used to manage traffic during construction, and it will be shared with local law enforcement, schools and local landowners.

A final delivery route has not yet been finalized, but it is likely that delivery of Facility components to the Project Area will be from the north by way of US35 to SR753 to SR41 that is adjacent to the east side of the Project Area. An alternate route would be from the south by way of US50 to SR41. Within the Project Area, county and township roads and new private gravel access roads will likely be used to deliver equipment and materials.

All of the roads that were reviewed can be used for equipment delivery and construction traffic with the exception of Rolfe Road. We would recommend that Rolfe Road not be used due to its condition and width. If needed, it could be used for project development with improvements.

Once the final Facility layout is complete and the final vehicle characteristics can be determined, the final delivery routes will be finalized with the County Engineer.

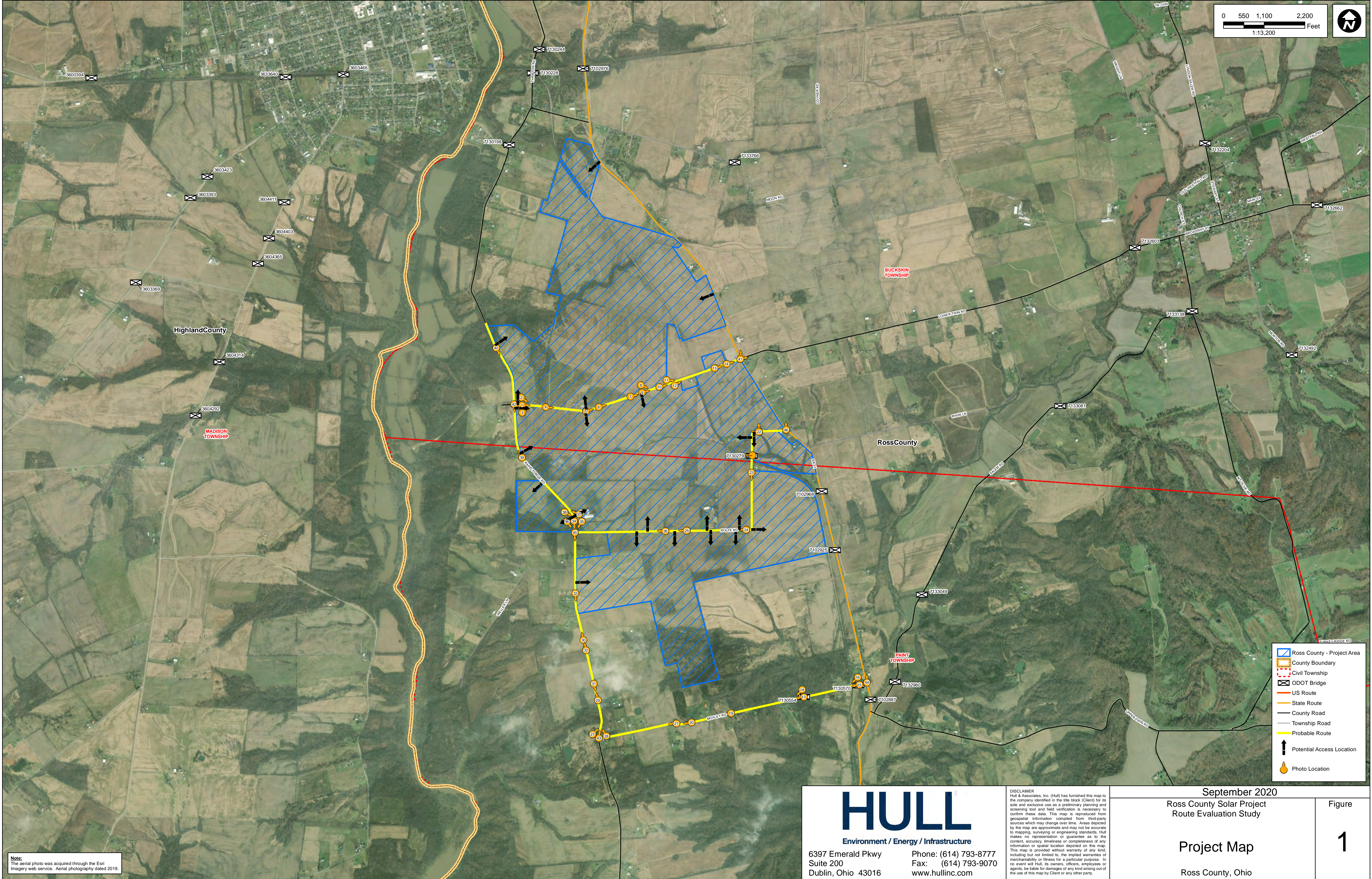
All roads should be monitored during construction for deterioration to ensure they are safe for local traffic. The volume and/or weight of construction traffic may cause accelerated pavement deterioration or stress on

drainage structures that could necessitate temporary repairs. After completion of construction activities, there may be improvements required to return the roadways and drainage structures to pre-construction conditions.

## **APPENDIX A**

### **Project Map**





**Note:**  
The aerial photo was acquired through the Esri Imagery web service. Aerial photography dated 2019.

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September 2020  
Ross County Solar Project  
Route Evaluation Study

Project Map

Ross County, Ohio

Figure

1



## **APPENDIX B**

Photo Pages



PHOTO 1: Pavement distress (edge failure) on Lower Twin Road, looking east.



PHOTO 2: Pavement distress (edge deterioration) on Lower Twin Road, looking east.





PHOTO 3: Pavement distress (edge deterioration) on Lower Twin Road, looking east.



PHOTO 4: Pavement distress (edge deterioration and pothole repair) on Lower Twin Road, looking east.

**HULL**  
Environment / Energy / Infrastructure

Ross County Solar Project  
Route Evaluation Study

Site Photographs

Ross County, Ohio

Date:

September 2020

Project Number: EVD003

File Name:

EVD003.0001.XLSX





PHOTO 5: Pavement distress (edge deterioration and pothole repair) on Lower Twin Road, looking east.



PHOTO 6: Pavement distress (pothole repair) on Lower Twin Road, looking east.





PHOTO 7: Pavement distress (cracked pavement) over culvert on Lower Twin Road, looking east.



PHOTO 8: Pavement distress (edge failure) on Lower Twin Road, looking east.





PHOTO 9: Pavement distress (cracked pavement) over culvert on Lower Twin Road, looking east.



PHOTO 10: Pavement distress (cracked and depressed pavement) over culvert on Lower Twin Road, looking east.





PHOTO 11: Pavement distress (pothole) on Lower Twin Road, looking east.



PHOTO 12: Pavement distress (edge failure) on Lower Twin Road, looking east.





PHOTO 13: Pavement distress (edge failure) on Lower Twin Road, looking east.



PHOTO 14: Pavement distress (edge failure) on Lower Twin Road, looking east.





PHOTO 15: View of west bridge (7130570) abutment on Moxley Road.



PHOTO 16: View of east bridge (7130570) abutment and embankment erosion on Moxley Road.





PHOTO 17: View of bridge (7130554) on Moxley Road, looking west.



PHOTO 18: View of bridge (7130554) and embankment erosion on Moxley Road, looking west.





PHOTO 19: View of pavement transition on Moxley Road, looking west. Pavement in good condition east of this location and in fair condition west of this location.



PHOTO 20: Pavement distress (alligator cracking) on Moxley Road, looking west.

|   |  |  |
|---|--|--|
|  | <p>Ross County Solar Project<br/>Route Evaluation Study</p> <p>Site Photographs</p> <p>Ross County, Ohio</p> | <p>Date:</p> <p>September 2020</p>                                   |
|   |  | <p>Project Number: EVD003</p> <p>File Name:<br/>EVD003.0001.XLSX</p> |





PHOTO 21: Pavement distress (edge deterioration) on Moxley Road, looking west.



PHOTO 22: Embankment erosion at culvert on Rolfe Road, looking west.





PHOTO 23: Typical pavement distress (transverse cracking) on Rolfe Road, looking south.



PHOTO 24: Pavement distress (cracked pavement) over culvert on Rolfe Road, looking west.





PHOTO 25: Pavement distress (cracked pavement) over culvert on Rolfe Road, looking west.



PHOTO 26: Pavement distress (depressed pavement) over culvert on Rolfe Road, looking west.





PHOTO 27: Pavement distress (edge deterioration) on Rapid Forge Road, looking north.



PHOTO 28: Pavement distress (edge deterioration) on Rapid Forge Road, looking north.





PHOTO 29: Typical pavement distress (transverse cracking) on Rapid Forge Road, looking north.



PHOTO 30: Typical pavement distress (transverse and longitudinal cracking) on Rapid Forge Road, looking north.





PHOTO 31: Pavement distress (cracked pavement) over culvert on Rapid Forge Road, looking south.



PHOTO 32: Pavement distress (cracked pavement) over culvert on Rapid Forge Road, looking north.





PHOTO 33: Pavement distress (cracked pavement) over culvert on Rapid Forge Road, looking south.



PHOTO 34: Pavement distress (cracked pavement) over culvert on Rapid Forge Road, looking south.





PHOTO 35: Minimal shoulder along curve on Rapid Forge Road, looking south.



PHOTO 36: Pavement distress (edge failure) on Rapid Forge Road, looking south.





PHOTO 37: Pavement distress (edge failure and pothole) on Rapid Forge Road, looking north.



PHOTO 38: Pavement distress (edge failure and repaired pothole) on Rapid Forge Road, looking south.





PHOTO 39: Pavement distress (edge deterioration) on Rapid Forge Road, looking north.



PHOTO 40: Pavement distress (edge failure) and shoulder erosion on Rapid Forge Road, looking south.





PHOTO 41: Intersection of SR41 and Lower Twin Road, looking east.



PHOTO 42: Intersection of Rapid Forge Road and Lower Twin Road, looking south.



PHOTO 43: Intersection of Moxley Road and Rapid Forge Road, looking north.



PHOTO 44: Intersection of SR41 and Moxley Road, looking north.





PHOTO 45: Intersection of Rapid Forge Road and Rolfe Road, looking south.



PHOTO 46: Intersection of SR41 and Rolfe Road, looking north.



# **TRAFFIC CONTROL PLAN**

FOR THE:  
**ROSS COUNTY SOLAR PROJECT**  
**ROSS COUNTY, OHIO**

PREPARED FOR:  
**ENVIRONMENTAL DESIGN & RESEARCH, LANDSCAPE ARCHITECTURE,  
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**SEPTEMBER 2020**

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## LIST OF APPENDICES

Appendix A Traffic Safety Map (to be included prior to construction once routes are determined)



## 1.0 INTRODUCTION

This Traffic Control Plan (Plan) has been prepared for Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. on behalf of Ross County Solar, LLC for the Ross County Solar Project, an up to 120-megawatt (MW) solar energy facility to be located in rural Ross County, Ohio. The Ross County Solar study area is approximately 1,430 acres that will include solar panels, along with associated infrastructure such as access roads, electrical collection lines, and a project substation (Project Area).

This Plan was prepared by Hull & Associates, LLC (Hull). This Plan will be submitted as part of Ross County Solar's Ohio Power Sitting Board application for a Certification of Environmental Compatibility and Public Need. This Plan will be reviewed and updated upon receipt of the final Facility layout and upon determination of final transportation routes. A Traffic Safety Map will be incorporated into Appendix A to finalize the Plan upon receipt of this information.

The Ross County Solar Project has developed this Plan to:

- Provide roadway users with adequate knowledge of regulations, warnings and guidance needed for the uniform and efficient operation
- Provide protection for workers who may be endangered by vehicular traffic
- Provide written instruction for Temporary Traffic Control Person(s)(TTCP)
- Protect vehicular and/or pedestrian traffic that may travel on:
  - State Route 41
  - State Road 28
  - County Road 1
  - County Road 9
  - County Road 54
- Provide consideration to the most convenient route for vehicular and/or pedestrian traffic throughout the duration of this project
- Provide the five basic requirements for an effective traffic control device
  - Fulfill a need
  - Command attention
  - Convey a clear, simple meaning
  - Command respect from road users
  - Give adequate time for proper response

The material in this document reflects Hull's professional judgement considering the scope, schedule and other limitations stated in the document. The information is subject to change based on constructability and site conditions.

## **2.0 LEADERSHIP AND ADMINISTRATION**

The purpose of this section is to define the responsibilities of the construction contractor, subcontractor and any workers who will directly oversee or perform any temporary traffic control operations on this project. It is the responsibility of Contractor and the subcontractor to ensure that all workers in their respected areas have been oriented to this Plan.

Every employer shall develop and implement a Plan for any worker that may be exposed to hazards from vehicular traffic.

The Plan:

- shall specify the vehicular traffic hazards and the measures described in subsection to be used to protect workers
- shall be kept at the project site and made available to an inspector or a worker upon request.

The contractor is responsible for maintaining the following traffic control principals:

- Traffic movement should be disrupted as little as possible
- Road users shall be guided in a clear and positive manner while approaching and within construction, maintenance, and utility work areas
- Routine inspections and maintenance of traffic control elements should be performed both day and night.
- Both the local agency and the contractor should assign at least one person on each project to have day-to-day responsibility for assuring that the traffic control elements are operating effectively, and any needed operational changes are brought to the attention of their supervisors.

### **WORKER (TEMPORARY TRAFFIC CONTROL PERSON) RESPONSIBILITIES**

This section applies with respect to directing vehicular traffic that may be a hazard to workers on a public way.

- A worker shall not direct vehicular traffic for more than one lane in the same direction
- A worker shall not direct vehicular traffic if the normal posted speed limit of the public way is more than 55 Miles per hour.
- A worker who is required to direct vehicular traffic,
  - shall be a competent worker
  - shall not perform any other work while directing vehicular traffic
  - shall be positioned in such a way that he or she is endangered as little as possible by vehicular traffic
  - shall be given adequate written and oral instructions, in a language that he or she understands, with respect to directing vehicular traffic, and those instructions shall include a description of the signals that are to be used.

All workers shall be knowledgeable of this project-specific Plan and work deliveries the standards and guidelines provided within. In addition, all workers who serve as TTCP on this project will be responsible for but not limited to:

- Immediately reporting to the Project Superintendent any contravention(s) or concern(s) with the project-specific Plan; and
- Proof of training records for all personnel involved with temporary traffic control operations.

Please refer to the Ohio Department of Transportation (ODOT), Guidelines for Traffic Control in Work Zones. If the TTCP cannot perform the work as noted, the contractor shall develop a plan to eliminate the hazards (change the route) or implement a device (light or police-directed traffic) to safely complete the job.



### 3.0 SAFETY PROCEDURES

One of the most important things to consider throughout construction is safety. The following is a list of key points that every worker should be familiar with.

- **Be seen.** Make sure you wear high visibility clothing, including a vest and hard hat.
- **Communicate.** If you are working near construction vehicles and equipment, make sure the operator/ driver knows where you are located. DO NOT assume he/she can see you.
- **Stay back.** Do not approach moving equipment. Communicate with the driver using a radio, hand signals, etc. Only approach the vehicle once the operator has stopped operations.
- **Plan.** Set up a plan or procedure — some call it an "internal traffic control plan" — to separate workers from the paths of vehicles and equipment. Make sure vehicles know where workers are located, and workers know where equipment is operating.
- **Look out for other workers.** Use a whistle, air-horn, or other device to warn fellow workers when they are in danger.
- **Positive Separation.** Separate workers from traffic using "positive separation," such as barriers, road closures, shadow vehicles, and buffer space. Remember, this separation is important for BOTH roadway traffic and construction vehicles.
- **Backing a Vehicle.** All drivers are required to have a spotter when/if they are backing their vehicle on the project site.

#### FLAGGERS AND DIRECTING TRAFFIC

- **Get trained.** Do not accept an assignment to be a flagger unless you have been properly trained. You must know where to stand, how to dress, and how to properly communicate with motorists.
- **Wear high visibility clothing.** Know what type of clothing you should wear depending on the speed of traffic, the time of day, and the complexity of your surroundings.
- **Stay focused.** Keep your eyes on oncoming traffic. Make sure your signals are clear and do not conflict with other traffic control signals.
- **Plan an escape.** Plan a route so you can move quickly to safety if a motorist does not appear to heed your signals.
- **Warn fellow workers.** Make sure you have a way to quickly warn other workers when vehicles do not respond to your signals.
- **Respect motorists.** Be courteous. Do not respond to abusive drivers. Notify law enforcement if necessary.

## **4.0 PERSONAL PROTECTIVE EQUIPMENT**

The purpose of personal protective equipment (PPE) is to minimize exposure to hazards that can cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. PPE may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests, and full body suits. The contractor is responsible for equipping any onsite personal with the minimum required PPE. In addition, the contractor is responsible to ensure that all workers have been equipped with task-specific PPE and has received the proper training.

### **TASK-SPECIFIC PPE FOR TEMPORARY TRAFFIC CONTROL PERSON(S)**

General PPE for Work Zone and Traffic Control workers includes:

- Hard hat for overhead impact or electrical hazards
- Eye protection with side shields
- Gloves chosen for job hazards expected
- ANSI – approved protective footwear
- Respiratory protection as necessary – N, R, or P95, filtering facepieces may be used for nuisance dusts and mold. Filters with a charcoal layer may be used for odors.
- High Visibility Clothing - For daytime, flaggers shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standard for High Visibility Apparel and Headwear" and labelled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. The apparel background (outer) material color shall be fluorescent orange-red, fluorescent yellow-green, or a combination of the two as defined in the ANSI standard. The retroreflective material shall be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1000 feet. The retroreflective safety apparel shall be designed to clearly identify the wearer as a person.

### **TASK-SPECIFIC TOOLS/EQUIPMENT FOR TEMPORARY TRAFFIC CONTROL PERSON(S)**

As outlined in the Ohio Department of Transportation, Guidelines for Traffic Control in Work Zones.

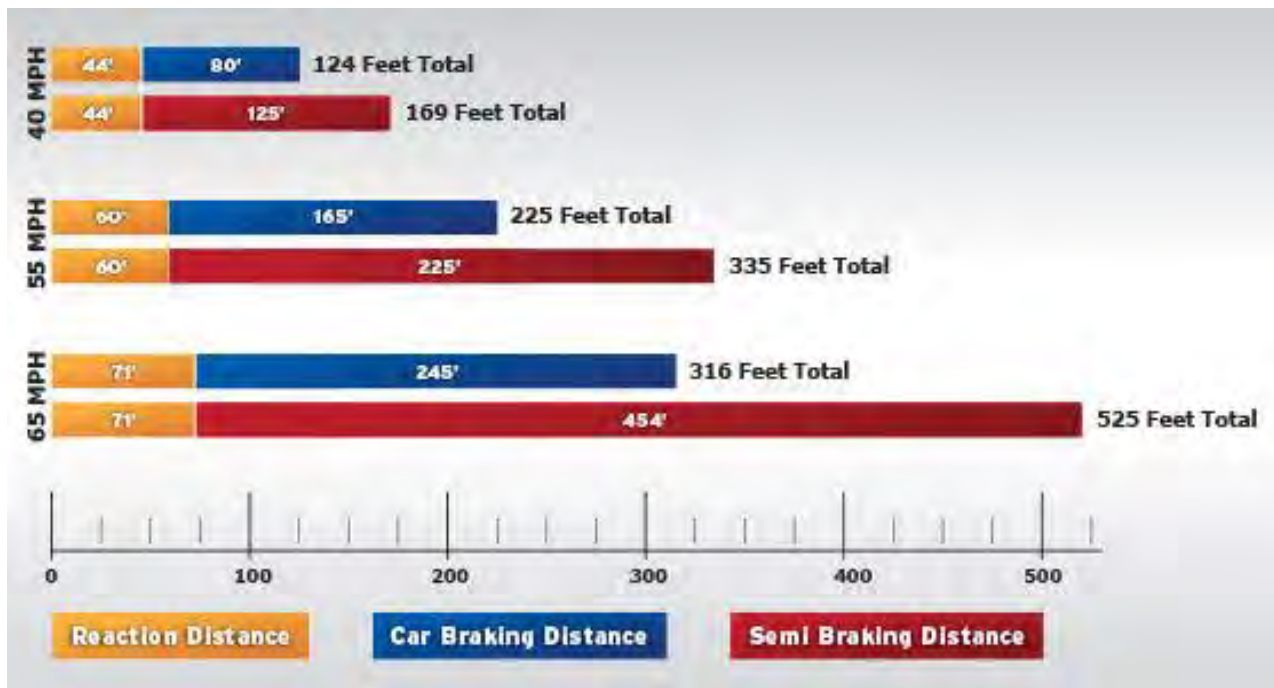


## 5.0 GENERAL PROJECT GUIDELINES FOR TEMPORARY TRAFFIC CONTROL PERSON(S)

The TTCP will follow these general project requirements:

- Health and safety are a top priority. At all times, the workers must be mindful of their environment when directing/assisting vehicular and pedestrian traffic.
- Plan an emergency exit strategy that is free of obstructions and potential slip/trip hazards if you need to react quickly. Obstructions could include, but are not limited to:
  - Jersey barriers, guardrails, traffic delineation devices, fencing.
  - Parked vehicles, equipment, or machinery
  - Stockpiled materials; and
  - Fixed/temporary structures such as existing buildings or gate sheds.
- Be alert and stand while on duty. Never sit down as this could impede your response time and ability to react to avoid personal injury caused by vehicles and/or equipment. The use of personal phones, radios or other electronic devices is strictly prohibited while on duty.
- Always face oncoming traffic and never turn your back to moving vehicles and/or equipment.
- Worker shall be mindful of the environment in which they are working and how it may impede the reaction time of any motorists, pedestrians, or operators needs to be considered. Examples include but are not limited to:
  - Curves in the roadway
  - Hills before or after your assigned position
  - Posted speed limits on the roadway or intended path of travel
  - Weather conditions (wet/slippery roads from rain/snow/ice vs dry conditions) and
  - Lighting (consider potential glare caused by sunrise and sunset).

The following illustrates how long it takes to stop an average-sized vehicle:



- When possible, ensure that you are standing alone and avoid mingling with other workers on the project as this may cause motorists, pedestrians, or operators to lose sight of your signals and/or direction.

- Position yourself just outside of the traffic lane or intended path of travel to avoid potential struck-by injuries.
- Consider potential blind spots of motorists, pedestrians or operators while giving signals. Always maintain eye contact with the motorist or operator you are directing to ensure understanding and compliance with your signals and/or direction.
- Verify that the appropriate temporary traffic control signage is in place prior to taking your position on any public roadway. The signage required is referred to as a TC-21 (as shown in the ODOT Traffic Control & Maintenance of Traffic Standard Drawings) and must be removed or covered when a TTCP is not present to control traffic. This includes break periods.
- Be alert for any oncoming emergency vehicles that have priority rights. Take the necessary actions to allow them to safely pass through your designated area as quickly as possible.
- Be aware of high pedestrian traffic areas such as school bus/public transit stops. Remember that most of these utilize a consistent schedule through the week.
- Coordinate your operations with any nearby traffic control signal systems like railway crossings, pedestrian crosswalks, and intersection lighting to avoid conflicting with them.
- Scheduled break periods are to be coordinated with your immediate supervisor. Only another competent worker that has been adequately trained and who is wearing the appropriate task specific PPE for a TTCP can relieve you of this position.
- DO NOT leave your designated traffic control position unattended at any time.
- Visitors, Delivery Drivers and Vendors entering the project must be directed to the construction contractor's project office. This is required to ensure that they sign-in and sign-out and report to the responsible primary contact on the project.
- Anyone entering the prescribed area in which PPE is required, must comply with the Project Safety Plan. As a TTCP, you have the authority to withhold workers and visitors from entering the project without the minimum PPE requirements.
- The project perimeter fencing is to be maintained as per the project Plot Plan. The set-up and design of the perimeter fencing is to be established to maintain project security at all times.
- Complete a daily review of the Plan, Traffic Safety Map , and daily Job Safety Analysis (JSA) to ensure you are knowledgeable of current project conditions, hazards, and controls.
- Designated gates are to be kept closed unless there is a steady flow of traffic in/out of the project.
- In the event of an emergency, immediately contact your supervisor. Depending on the nature of the emergency or incident, there may be a requirement to clear the area or direct vehicular or pedestrian traffic to an alternate location. Follow the direction of your immediate Supervisor.
- In the event that you are subjected to any form of workplace violence, harassment, discrimination or issues pertaining to compliance with this project specific Plan by any worker, visitor, vendor or member of the general public, contact your immediate supervisor. DO NOT engage or provoke the situation any further. You will be held accountable for your actions.
- Remember that while working as a TTCP on this project, you could be required to directly interact with the general public. Be cautious of any gestures or comments made while on duty as you represent your company and will be held accountable for your actions at all time



## **TRAFFIC CONTROL ON PUBLIC ROADS**

Workers can be endangered on projects adjacent to, or on, public roads. The main hazards involve placing traffic control devices on the roadway and working alongside moving traffic. The best way to prevent hazards from the motoring public is to plan the work site carefully beforehand. Consider traffic control devices, access and egress, signage, timing of work, and worker training.

## **TRAFFIC CONTROL DEVICES**

Signs will be posted at entrances to advise drivers and operators that a signaler will be required to guide vehicles wherever the view of the intended path is obstructed, or workers may be in danger.

Please refer to the ODOT Traffic Control and Maintenance of Traffic Standard Drawings for proper guidance and layout of the traffic control for this project.

## **6.0 PROJECT SPECIFIC CONSIDERATIONS**

The following section has been developed to outline project-specific details including:

- Traffic Safety Map (Appendix A)
- Primary Roadway(s) and intersection(s) - See the Route Evaluation Study

### **PROJECT PLOT PLAN/PROJECT SPECIFIC TRAFFIC PLAN**

A traffic safety map will be developed and added to Appendix A upon receipt of the final Facility layout. This map will communicate the following to all workers and visitors:

- Adjacent streets or intersections
- Access gates
- Perimeter fencing configuration
- Emergency assembly area(s)/muster point(s)
- Contractor's project office and Subcontractor offices (if applicable)
- First aid kits
- Spill kit(s)
- Designated storage / laydown area (if applicable)
- Project-specific information

A copy of the project-specific Traffic Safety Map is to be posted on the project safety bulletin board.



## **7.0 PERMITS AND GENERAL CONSIDERATIONS FOR TRAFFIC CONTROL**

### **CHECKLIST BEFORE ANY DELIVERY**

- Coordinate with the appropriate authority regarding any temporary or permanent road closures, lane closures, road access restrictions, and traffic control necessary for construction and operation of the proposed facility. Coordination shall include, but not be limited to, the County Engineer, the Ohio Department of Transportation, local law enforcement, and health and safety officials.

This information will be provided as part of a Final Plan.

- Criteria to be taken into consideration:
  - School Bus Routes
  - Emergency Service Responder Information / Emergency Response Plan
  - Traffic Routes Load Bearing and Structural Rating Information
  - Road Surface Type and Widths
  - Culver Cover and Conditions
  - Posted Signs of Caution
  - Overhead Clearance
  - Traffic and Transportation Mitigation Measures
  - Monitoring of Roads during construction to assess potholing and deterioration and address repairs/ improvements
  - Road Use and Maintenance Agreements (RUMA)

## **8.0 MATERIAL DELIVERY AND TRUCKING ROUTES**

### **TRUCKING ROUTES (SUBJECT TO CHANGE)**

- Prior to all deliveries, a detailed investigation will be conducted of road integrity along the designated routes. The timeline for reporting damage and commencing repairs (20 days).
- Prior to all deliveries, a route analysis of overhead obstructions, particularly the clearance of electrical lines, shall be performed.
- Only County roads, bridges, culverts and construction entrances shown on the Traffic Safety Map (Appendix A) should be utilized for access to the project site from any County road.
- The contractor shall notify the County Highway Superintendent in advance of any oversize loads.
- If road closures are required, the construction contractor must give minimum advance notice of 24 hours to the County Engineer.
- The contractor will set up the delivery routes to the laydown areas. To coordinate the delivery to the correct gates, the contractor will highlight a map (Appendix A) and communicate to the routes to the delivery company.
- All major deliveries will be directed to the highlighted gate markers. All gates will have a contractor representative standing by to perform the delivery orientation and coordinate the delivery.
- All drivers are required to have a spotter when/if they are backing their vehicle on the project site.
- Major delivery routes will be coordinated using:
  - State Route 41
- Roadway maintenance will be completed (as needed) during construction. Maintenance items may include:
  - Mud cleaning/street cleaning
  - Sign removal or damage repair
  - Dust control
  - Snow Clearing
- The delivery driver will have ample notice of where he/she is going. The notice will be completed by email or phone call. Giving ample notice for direction will reduce the chances of missed exits, causing delays to the neighboring community roads.
- Once the driver has arrived at the site, he/she will be met by one of the contractor's employees for further direction. Upon leaving the driver will be given exit instructions.
- The driver will also have instructions, from the vendor, in advance to where he/she will be asked to wait/park for the construction contractor's direction. At this time, the driver will
  - Receive orientation
  - Sign in
  - Be provided a delivery slip for the shipment
  - The driver is not to start offloading or drive onto the site until he/she is directed by offloading sub-trade. After offloading is complete, the driver will sign out and exit the site.



## **APPENDIX A**

### **Traffic Safety Map**

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

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Summary: Application Application Exhibit M electronically filed by Mr. Michael J. Settineri on behalf of Ross County Solar, LLC