



2310 Crossroads Drive
Madison, WI 53718
McKinstry.com



Building, Site, and Operation Permit Application Narrative

Village of Caledonia, WI

Gifford School Ground Mount Solar Array

Applicant:

*McKinstry Essention, LLC
2310 Crossroads Drive Madison, WI 53718*

PROJECT DESCRIPTION:

The Racine Unified School District is working with McKinstry Essention, LLC to design, develop and construct a 238kWdc; 180kWac ground mount solar array, covering approximately 0.241 acres. McKinstry will complete all surveys and studies necessary to construct the array including geotechnical soil borings, pull tests, and a site survey. This array is part of a larger solar array system, with the remaining array on the rooftop of the school building. The full solar project (rooftop and ground mount arrays) will offset approximately 45% of the current buildings' electrical usage.

Construction is intended to start in the fall of 2025, pending receipt of all required permits and approvals and will reach substantial completion around 3-4 months. The goal of this array is to offset the Gifford Schools electrical consumption, while also showcasing clean energy technology for the school district and creating economic resiliency for District operations through significant cost savings long term. From this solar project, the District will avoid using 1,278,336 pounds of CO₂, which is equivalent to 68 homes' energy use for one year and 100 homes' electricity use for one year.

GENERAL LAND USE DESCRIPTION

Location

The ground mount solar array is located on a parcel of land that is approximately 28.468 acres of land owned by the Racine Unified School District in the Village of Caledonia. The solar array will occupy 0.241 acres of land on parcel number 10404223406400, north of Northwestern Avenue and east of Trudeau Terrace. The land is currently a maintained grassy area.

Zoning

The proposed solar array is situated on land that is zoned in R-3 Single Family Residential.

Setbacks

The solar array is situated on the land to follow all applicable setbacks, as shown in the attached site plan, including those defined by the Village of Caledonia Zoning Ordinance SEC. 16-6-5:

Street yard setback of 30'

Rear yard setback of 30'

Side yard setback of 10'

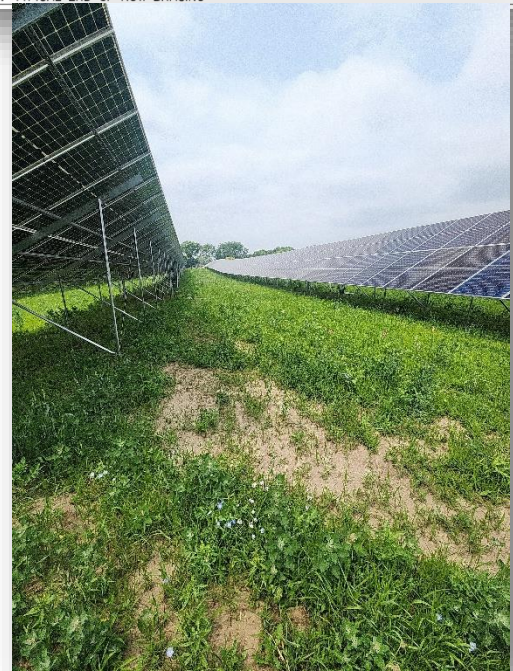
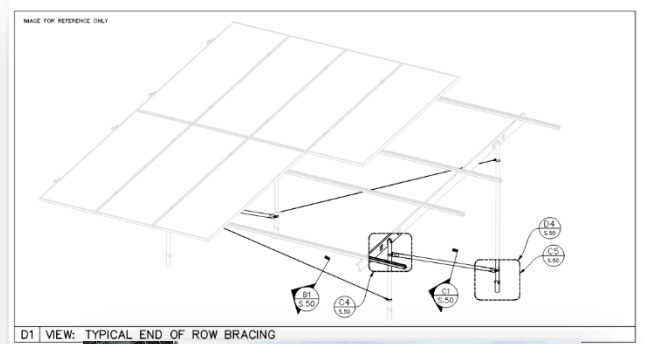
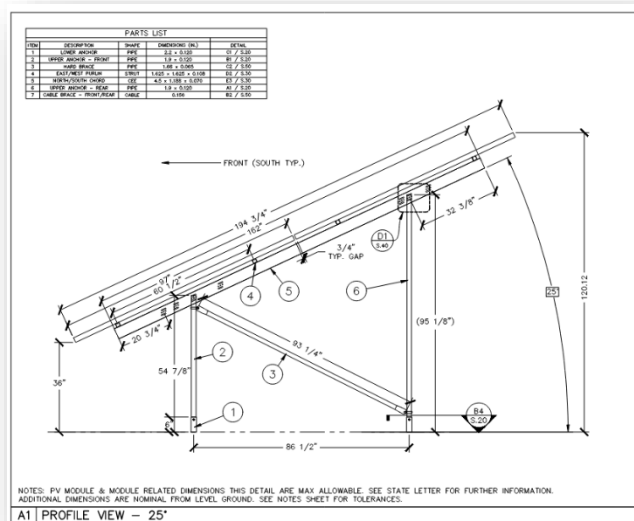
¹ https://geronimopower.com/wp-content/uploads/2025/02/NG_Renewables_SolarGlareFact-Sheet.pdf

DESCRIPTION OF EQUIPMENT

Racking

The racking for the proposed project consists of ground screws that are embedded approximately 79" into the ground and extend approximately 6" above ground. The posts are connected to the ground screws and attached to a Unistrut rack where the modules connect to the racking, as shown in the image to the right. All components of the racking system are galvanized steel.

Below is a depiction of the horizontal profile view of the panels and racking, which will run in 6 rows from north to south on the site. The modules are at a fixed 25-degree tilt and the tallest part of the panel is ~10' above ground level.



Solar Panels

The proposed solar array will utilize Jinko Solar JKM585N-72HL4-BDV bifacial modules. N-type solar modules use solar cells made from n-type silicon, which has electrons as the primary charge carriers, resulting in higher efficiency and better performance in low-light conditions.

These panels have an anti-reflective coating on them to minimize any glare or reflection from the sun. This coating reduces the amount of reflected sunlight to less than 2%, which is less reflective than a body of water or traditional window glass¹.

Additionally, [Test Results](#) from Jinko show these are high efficiency modules, thus having lower losses due to the sunlight reflecting off of them as the panels are more efficient at absorbing the irradiance as it hits the panels. They typically have longer operational lifespans compared to traditional p-type modules and can be recovered and recycled at the end of their useful life. PV panels are extremely durable and built for long service life, as indicated by their 30-year warranty.

Inverters

The proposed array will utilize Chint Power System inverters, located on the northwest corner of the array on a Unistrut rack.

¹ https://geronimopower.com/wp-content/uploads/2025/02/NG_Renewables_SolarGlareFact-Sheet.pdf

Fence

There will be a 7ft black vinyl chain link security fence with 10ft post spacing surrounding the array. A 20 ft wide swing, maintenance gate will be located on the south side of the array, lining up with the existing paved path. There will be a 20ft setback from the fence to the edge of the panels, along all four sides of the array. An example of the proposed fence is shown in the image to the right.

LANDSCAPING

The site currently consists of an open grassy space, surrounded by trees. To construct the array, three existing pine trees will be removed from the north side of the property. The two trees in the front of the property will remain; Furthermore, additional 6ft tall Fat Albert blue spruce trees and Technito Arbor Vitaes bushes will be planted around the south and east perimeters of the fence line for screening from the roadway and adjacent properties.

Within the perimeter of the fence, the land will be re-seeded with a pollinator mix to maintain a natural habitat and eliminate frequent landscaping maintenance around the fence and racking. An image of a pollinator habitat in the first year is shown to the right. A rendering of the site is shown below.



¹ https://geronimopower.com/wp-content/uploads/2025/02/NG_Renewables_SolarGlareFact-Sheet.pdf