

## **Watt Works Designs 20 Acre Solar Array to Supply Power to City of Celina, Ohio**

### ***5 Megawatt Array Dedicated to Local Municipal Electric Grid***

When developer Solarvision LLC agreed to build a 5 Megawatt solar power plant for the City of Celina Municipal Power Department, under a long term Power Purchase Agreement, they called on Watt Works to design the project. Initial drawings were based on 3 Megawatts with an option shown for an additional 2 MW, and were in enough detail to get complete pricing and construction timeline commitments from potential installers. The design was also sent through a preliminary technical review with the local code authority, who made a concerted effort to get up to speed on assuming their inspection responsibility for this new technology at such a large scale.

The solar array consists of fixed racks of 22 panels each, using 240W rigid crystalline Silicon panels. Each of these series strings operate at 1000VDC and are mounted atop screw-anchor posts that keep the panels 30 to 48" above grade in East-West rows. The anchor elevations have to account for a rolling site with a southward slope into a flood plain. The rows of arrays are wired to DC combiners and busbar collectors that feed 3 inverters on power station platforms that generate 480VAC three phase power to a transformer on the 13.8kV distribution system. Multiple platforms and sets of inverters and transformers replicate the paralleled power scheme. The inverters are made in Toledo and are specifically designed to allow maximum efficiency of power production at all sun intensities as is commonly seen in Ohio.

Complicating the design was a 200 ft. tall cellular tower at the center of the West boundary of the site that casts a shadow arc that impacts power generation as it sweeps across the array. The array was laid out to eliminate panel racks within the shadow-prone wedge. Sourcing 1000VDC panels, cable, connectors and inverters was eased by the experiences manufacturers have had with 1000VDC photovoltaic systems in Europe. The U.S. NEC (National Electric Code) and UL product testing is just beginning to incorporate the needs of the higher voltage systems.

Such a large site of this value demands extra care providing security through fencing, lighting, cameras and alarms. As a power generation system with elements at distribution voltages, extreme grounding measures are required for worker safety and system integrity. Having a proximity to flood-prone areas demands extra care with elevations, drainage, driveways and piling installation.

Watt Works Inc. heads the design team that includes firms providing civil engineering and survey work, geotechnical soils work, rack and anchor structural engineering, and result in a project that is safe to operate, will readily withstand wind and weather extremes, and will produce a predictable amount of power to meet the financial goals of the investors and the City of Celina. Construction is to begin second quarter of 2012.

*Call Watt Works today to Design your next project !*