

# Solar Energy and Sandstone Creek Solar

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## About Geronimo Energy

- Utility-scale renewable energy developer headquartered in Edina, MN
- 1,500 MW of wind and solar in operation or under construction
- 100 MW Aurora Project
- ~100 MW CSG Portfolio
- Solar Project Pipeline of over 2000 MW



## Solar Projects Generally Consist of:

- Inverters
- Modules/Panels
- Racking
- Access Roads
- Electrical Components (e.g. cables, transformers, switchgears, control systems)
- Security Fencing
- Storm-water Retention Areas
- Operation and Maintenance shed



# Primary Components of a Solar Facility:

## INVERTERS



## Primary Components of a Solar Facility: MODULES/ PANELS

Thin Film



Polycrystalline





## Primary Components of a Solar Facility: RACKING



Fixed Tilt



Tracking

## Key Parts of Solar Facility Construction

- Site Preparation
- Pier Installation
- Racking Installation
- Module Installation
- Interconnection
- Re-vegetation



## Solar Facility Construction





## Solar Facility Construction



# Key Parts of Solar Facility Construction

## SITE PREPARATION



# Key Parts of Solar Facility Construction

## PIER INSTALLATION





## Key Parts of Solar Facility Construction

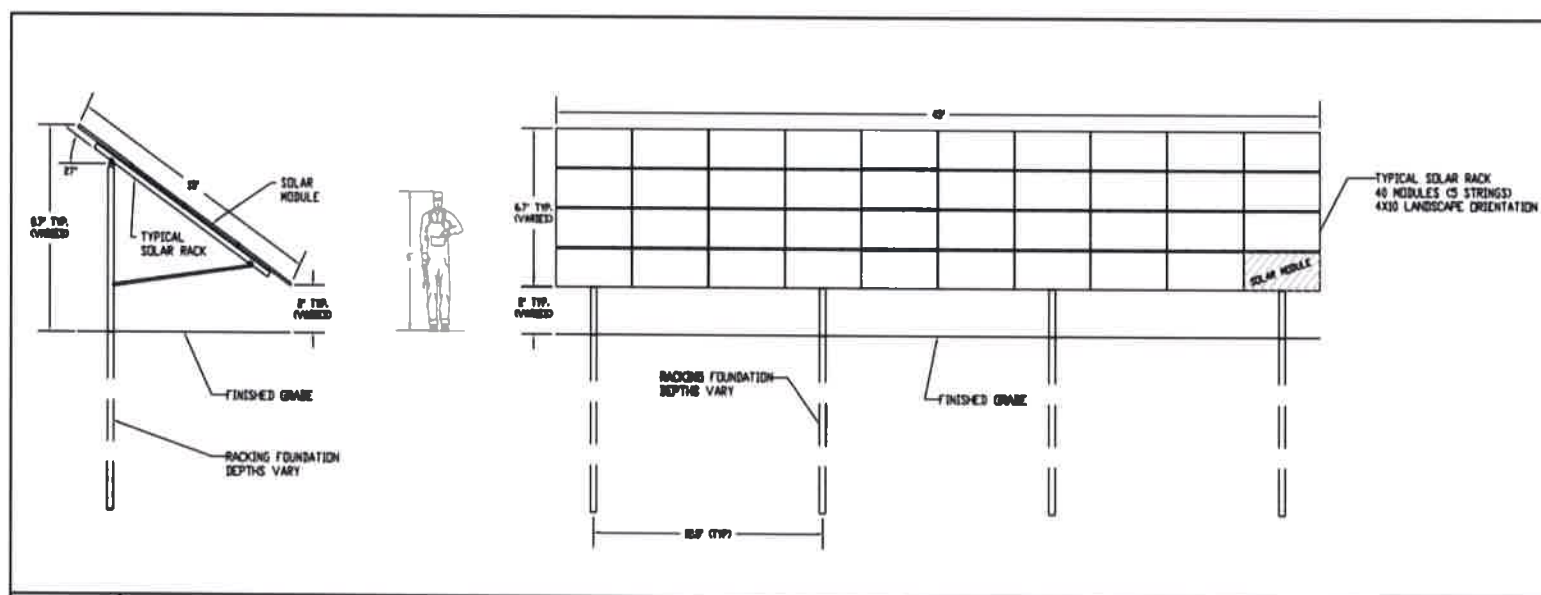
### INSTALLATION





# Key Parts of Solar Facility Construction

## TYPICAL RACKING AND MODULE SPECS



# Key Parts of Solar Facility Construction

## RESTORATION & RE-VEGETATION



## Vegetation Management

- Seed mix
- Controlled for noxious weeds



## Solar Farm

**Location:** Blackwell Side Road, Lambton County, Ontario, Canada. East of the City of Sarnia.

**Size:** ~80 acre solar farm





## Solar Farm

**Location:** Blackwell Side Road, Lambton County, Ontario, Canada. East of the City of Sarnia.

**Size:** ~25 acre solar farm



## View of both Solar Farms



## Common Solar Concerns

### SOUND

- At 150 feet sound from a PV system is at a background level

### MAGNETIC FIELDS

- Exposure Limit is 833mG
- 150' from inverters were measured at 0.5 to 0.2 mG (background level)

"Study of Acoustic and EMF Levels From Solar Photovoltaic Projects", Prepared for: Massachusetts Clean Energy Center.  
Prepared by: Tech Environmental, Inc. December 17, 2012.





## Common Solar Concerns

### ELECTRIC FIELDS/ STRAY VOLTAGE

- Exposure limit is 4,200V/m for public
- 50-150' readings were <5V/m (background level)

“Study of Acoustic and EMF Levels From Solar Photovoltaic Projects”,  
Prepared for: Massachusetts Clean Energy Center. Prepared by: Tech  
Environmental, Inc. December 17, 2012.

- Solar projects adhere to both National Electric and Building Code standards ensuring proper and safe installation





## Common Solar Concerns

### GLARE

- PV systems reflect only about 2% of incoming sunlight.
- Systems are designed to absorb sunlight to produce energy
- Panel glare to air traffic is similar to a lake or surface water.
  - A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat-Plate PV Systems, Black & Veatch Corporation, August 2011.
  - Questions and Answers, Ground Mounted Solar Photovoltaic Systems, Massachusetts Departments of Energy, Environmental Protection and Energy Center, June 2015



## Common Solar Concerns

### DRAINAGE

- Site will be graded as needed
- Storm water basins and holding ponds will be designed to control any runoff
- Seeding property will reduce runoff and increase infiltration



## Economic Impact

### ESTIMATED CAPITAL/CONSTRUCTION COSTS

- ~\$ 77 Million in Capital
- ~\$ 5.5 Million in Local Spending

### ESTIMATED JOB CREATION

- ~Supports 90 construction related jobs
- ~3 full-time equivalent jobs; includes project and operational managers
- ~\$3 Million in wages onsite during 20 years of operation



\*Economic numbers are based off National Renewable Energy Laboratory (NREL) model of a full build out of the facility.\*

## Contact Information

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