

COMMERCIAL GRID-DIRECT PHOTOVOLTAIC SYSTEM: Pearl Brewery, Full Goods Building

Overview

DESIGNER: Tommy Jacoby, VP of design, Meridian Solar, meridiansolar.com

PROJECT MANAGER: Jason Comstock, Meridian Solar

DATE COMMISSIONED: March 2009

INSTALLATION TIMEFRAME: 10 weeks

LOCATION: San Antonio, TX, 29.5°N

SOLAR RESOURCE: 5.4 kWh/m²/day

RECORD LOW/AVERAGE HIGH TEMPERATURE: 0°F / 95°F

ARRAY CAPACITY: 200.6 kW

AVERAGE ANNUAL AC PRODUCTION: 267 MWh



Courtesy meridiansolar.com (4)

Equipment Specifications

MODULES, FLAT ROOF: 608 SCHOTT Solar ASE 300 DGF/50, 300 W STC, +4%/-4%, 5.9 Imp, 50.6 Vmp, 6.5 Isc, 63.2 Voc

MODULES, AWNINGS: 96 Sanyo HIP-190DA3, 190 W STC, +10%/-0%, 3.44 Imp, 55.3 Vmp, 3.7 Isc, 68.1 Voc

INVERTERS: 3-phase, 208 Vac service, four SMA ST42 (SunnyTower), 42 kW each, six SB7000US per tower, 600 Vdc maximum input, 250-480 Vdc MPPT range; one additional SMA SB6000US, 6 kW, 600 Vdc maximum input, 250-480 Vdc MPPT range

In April 2001, when the Pearl Brewery in San Antonio, Texas, shuttered its doors after 118 years of operation, many considered the buildings on the 22-acre site a prime target for demolition. Instead, the historic landmark was saved thanks to the vision of investor Silver Ventures and the site's proximity to a planned 1.3-mile extension of the famous San Antonio River Walk. Providing a terminus for tourist barges, the renovated Pearl Brewery complex anchors the sustainably built urban revitalization project known as Rio Perla. At the heart of the project is the Full Goods Building, a former beer distribution warehouse redeveloped as mixed-use office, retail, restaurant and residential space. Renovated to LEED standards, the Full Goods Building is home to a 200 kW grid-connected PV array, the largest privately owned PV system in Texas.

Designed by Meridian Solar, the bulk of the PV generating capacity—182 kW—is installed on a new TPO membrane roof using SCHOTT Solar ASE

300 W modules and the manufacturer's proprietary SunRoof FS mounting system. TPO-compatible slipsheet material is installed under each array base plate. The locations and types of rooftop equipment and skylights changed over time or were not built as specified. This necessitated multiple engineering reviews to ensure that ballast and setback requirements were met and the manufacturer's warranty remained intact.

An additional 18 kW of PV are installed as shade canopies at the building's main and service entrances. Meridian Solar worked closely with architect Lake|Flato to custom design canopies using standard metal I-beams or trusses, ProSolar SolarWedge hardware and Sanyo bifacial 190 W HIT Double modules. A UL-listed polypropylene film separates the aluminum mounting baseplate from the building's structural steel to prevent galvanic corrosion associated with the contact of dissimilar metals.

Due to space constraints, the inverters are located on the roof, installed on a



custom elevated steel platform. SMA SunnyTowers simplify transportation to the roof but were primarily specified to facilitate the use of multiple module technologies. Within the SMA ST42, each inverter operates independently; this allows the Sanyo and SCHOTT modules to be wired to separate inverters on the same tower. CPS Energy, the municipal utility, required that Meridian Solar tighten the voltage trip points on each inverter, which was unexpected since smaller PV systems in its service territory interconnect using unmodified inverters.

CPS Energy provided partial funding for the PV system at the Full Goods Building and intends to study system performance. Therefore, the data acquisition solution provided by Draker Laboratories includes

weather sensors and performance analytics. In addition, the high profile installation facilitates public outreach and education by means of an interactive kiosk with a large-screen display located in the Full Goods Building lobby. Information about the PV system at the Pearl Brewery, including an installation video, is available online at pearl.kiosk-view.com.

“When the utility told us to tighten voltage settings in the inverters, we complied—though we advised otherwise. After they saw the inverters nuisance tripping due to their own grid signature, they gave us permission to restore the factory settings. This not only proved our expertise, but also our commitment to customer service.”

—*Andrew McCalla, CEO, Meridian Solar*



Equipment Specifications

CONTINUED

ARRAY, FLAT ROOF: Twenty 28 module subarrays with seven modules per string (2,100 W, 5.9 Imp, 354.2 Vmp, 6.5 Isc, 442.4 Voc) and four circuits per inverter (8,400 W, 23.6 Imp, 354.2 Vmp, 26.0 Isc, 442.4 Voc); two 24 module subarrays with eight modules per string (2,400 W, 5.9 Imp, 404.8 Vmp, 6.5 Isc, 505.6 Voc) and three circuits per inverter (7,200 W, 17.7 Imp, 404.8 Vmp, 19.5 Isc, 505.6 Voc)

ARRAY, AWNINGS: One 36 module subarray with six modules per string (1,140 W, 3.44 Imp, 331.8 Vmp, 3.7 Isc, 408.6 Voc) and six circuits per inverter (6,840 W, 20.6 Imp, 331.8 Vmp, 22.2 Isc, 408.6 Voc); two 30 module subarrays with six modules per string and five circuits per inverter (5,700 W, 17.2 Imp, 331.8 Vmp, 18.5 Isc, 408.6 Voc)

ARRAY COMBINER: Inverter integrated with 15 A fuses

ARRAY INSTALLATION, FLAT ROOF: SCHOTT Solar’s self-ballasted SunRoof FS mounting system on TPO membrane, 190° azimuth, 5° tilt

ARRAY INSTALLATION, AWNINGS: Professional Solar Products (ProSolar) SolarWedge hardware structurally attached to metal I-beams at main building entrance (10° tilt) and metal trusses at service entrance (15° tilt), 190° azimuth

SYSTEM MONITORING: Draker Laboratories Sentalis 1000PV monitoring package with public kiosk; utility installed revenue-grade PV meter