

# PROJECTS

System Profiles

## Native Texas State Bank



Courtesy Native (4)

### Overview

**DESIGNER:** Elijah Johnston-Heck, lead designer, Native, buildnative.com

**LEAD INSTALLERS:** Joe Silver, director of operations, and Les Wilcox, commercial solar project manager, Native; Casey Roberson, lead installer, 1Sun Solutions, 1sunsolutions.com

**DATE COMMISSIONED:**  
January 30, 2016

**INSTALLATION TIME FRAME:**  
52 days

**LOCATION:** San Angelo, TX, 31.5°N

**SOLAR RESOURCE:**  
5.31 kWh/m<sup>2</sup>/day

**ASHRAE DESIGN TEMPS:** 98.6°F  
2% average high, 14°F extreme minimum

**ARRAY CAPACITY:** 94.5 kWdc

**ANNUAL AC PRODUCTION:**  
140,658 kWh

Since opening its doors in 1963, Texas State Bank (TSB), a locally owned, independent community bank, has been a leader in San Angelo and many of the surrounding communities in west Texas. TSB has a history of investing in energy efficiency technologies. In 2014, the bank replaced the nation's first commercial heat pump HVAC system with a Mitsubishi variable refrigerant flow system that uses a cutting-edge commercial lineset metal ducting system from RectorSeal. In 2015, Chairman of the Board J. Mark McLaughlin and President and CEO Gary Cox turned their attention to the bank's large parking lot.

McLaughlin and Cox had taken notice of a nearby solar

carport structure at the San Angelo Museum of Fine Arts. They subsequently learned that Native, a solar integrator and green building company with offices in Austin, San Antonio and Dallas, had developed the 16.5 kW solar carport with funding from a Green Mountain Energy Sun Club grant, and they contacted the company. Despite the bank's existing energy efficiency investments and smart



energy management practices, Native realized early on that it would take a relatively large array to make a significant dent in the bank's energy bills. The resulting 94.5 kWdc solar carport will offset a projected 25% of TSB's electricity usage.

Elijah Johnston-Heck, Native's lead designer, developed the system's mechanical design around a carport structure from Denver-based S:Flex. The selected S:Flex 7-High PV Carport supports 43 seven-module columns of 72-cell Solartec 315 W modules in portrait orientation. TSB was very pleased with Native's recommendation of Solartec modules. Solartec is a Houston-based manufacturer, which aligns with the bank's values of supporting local businesses and creating Texas energy jobs. Six steel columns support the carport's upper structural members. The canopy's compact foundation footprint ensured that the lot did not lose a single parking space. TSB opted for a hot-dipped galvanized structure to assure its durability over the life of the system.

Several local businesses contributed to the TSB project. SKG Engineering provided geotechnical services. Monte Merriman of M&M Steel Erectors led the carport structure assembly. Accurate Drilling and Construction came through

on a tight schedule, providing the drilling and dirt work needed to mount the carport structure and trench through the parking lot to the bank's point of interconnection.

Two SMA America Sunny Tripower inverters provide power conversion for the 94.5 kW carport array. Native configured the system's STP60-US inverter with 12 20-module source circuits. The second inverter, an STP20000TL-US, has three 20-module source circuits. Native installed one extra module (at no cost) on the canopy that is not electrically connected to the system. For aesthetics, the carport layout required 301 modules, but keeping string lengths consistent resulted in a 300-module array. The extra module is available as an immediate replacement if needed.

"We installed the TSB project in under 15 weeks while working around the Thanksgiving, Christmas and New Year holidays. S:Flex was able to expedite its production schedule, and TSB President Gary Cox was instrumental in connecting Native with several local San Angelo businesses to help with key phases of the project."

— *Elijah Johnston-Heck, Native*



## Equipment Specifications

**MODULES:** 300 Solartec S72PC-315, 315 W STC, +3/-0%, 8.44 Imp, 37.3 Vmp, 8.93 Isc, 44.3 Voc

**INVERTERS:** 3-phase 480/277 Vac service; one SMA America Sunny Tripower STP20000TL-US, 20 kW rated output, 1,000 Vdc maximum input, 380–800 Vdc rated MPPT range, 150–1,000 Vdc MPPT operating range; one SMA Sunny Tripower STP60-US, 60 kW rated output, 1,000 Vdc maximum input, 685–800 Vdc MPPT range (at 480 Vac); one SMA America IM-10 Inverter Manager (for STP60-US)

**ARRAY (SMA STP60-US):** 20 modules per source circuit (6,300 W, 8.44 Imp, 746 Vmp, 8.93 Isc, 886 Voc), 12 source circuits total (75.6 kW, 101.28 Imp, 746 Vmp, 107.16 Isc, 886 Voc), source circuits aggregated at Shoals STG.CBC.12.BLBHNC01D0 combiner with 15 A fuses

**ARRAY (SMA STP20000TL-US):** 20 modules per source circuit (6,300 W, 8.44 Imp, 746 Vmp, 8.93 Isc, 886 Voc), three source circuits total (18.9 kW, 25.32 Imp, 746 Vmp, 26.79 Isc, 886 Voc), source circuits aggregated at SMA America 1000-US Connection Unit with 15 A fuses

**ARRAY INSTALLATION:** Parking canopy, S:Flex 7-High PV Carport, galvanized steel structural members, 10-foot vehicle clearance height, 238° azimuth, 15° tilt

**SYSTEM MONITORING:** eGauge Systems E3000 production and consumption monitoring

