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Inmates Become Solar Panel Specialists

By Jenny Ivy Byrne

CHILLICOTHE, Ohio — Phil Hix, marketing engineer for Indianapolis-based Design-Aire Engineering (DAE), was the ideal candidate to lend his knowledge to the vocational program at Chillicothe's Ross Correctional Institute, where he helped to install 400 solar panels for eight offender dorms at the facility. His 38 years of experience in mechanical construction has also helped corporate giants such as General Motors, Kroger and Walgreen's.

When it comes to sustainability planning, he's seen it all. When dealing with the Ross Correctional Institute's project, he knew he could help to transform the efficiency of the facility. The solar panels will now be the primary source of hot water and space heating for the dorms that were built in the late '80s and stretch across 1,700 acres.

The installation process began in December 2013, and the project finished in late July 2014. In those seven months, a dozen Class 3 inmates — identified as offenders that need close security — learned how to install and maintain the panels. The training will help offenders with possible vocational plans after release. Hix took the inmates through two weeks of classroom learning and the rest was hands-on instruction taught as though the inmates were apprentices at DAE.

Retired and working part-time for DAE, 62-year-old Hix took the time to write the curriculum and led the inmates through the rigorous construction process. "I based it on 30 years of an apprenticeship program that my company and I developed a couple of years ago. I put together a shorter version of that four-year program and turned it into a two-week classroom program," Hix said.

There are about 2,100 inmates at the minimum-security facility. The 12 inmates selected for the solar panel project have experience with maintenance around the prison, but none had experience in solar installation. Not knowing what their aptitude would be, Hix started the inmates off with basic math.

"Remarkably, every one of them could probably do practical sophomore algebra," Hix said. "Then, we moved into measurement and then reading blueprints. Then, we went into the theory of the solar thermal system itself — how it works, how it can be beneficial, where it's used in the world and how predominantly it's used in other parts of the world; the applications of what its use can be here in the United States; and the way that you can use that application to let it pay for itself through saving on the cost of conventional energy to the prison system."

Manufactured by Indianapolis-based Solar America Solutions, the SunQuest 250 solar panels used for the inmate facilities are expected to save taxpayers \$245,000 in annual energy costs. The company says the project is the largest non-utility solar installation in North America. The solar panels are made of evacuated tube solar thermal collectors that collect ultraviolet rays and transfer the heat to a liquid that's similar to antifreeze and then that heats water in large tanks inside the individual offender dorms. With 25 bulbs, each panel has a 3-by-7-foot roof footprint and an 88-square-foot absorption area. The panels are able to develop 30,000 BTU's per hour.

"This project was only able to achieve these high BTU outputs because of their advanced superiority and efficiency," Hix said. "There is nothing else on the market that is within 50 percent of them. We

were able to produce 160 degrees on a 7-degree day in February with clouds."

The solar panel project at Ross Correctional Institution is part of a broader plan that the Ohio Department of Rehabilitation and Correction (ODRC) launched in 2012. The ODRC's Three-Year Strategic Sustainability Plan aims to reduce water usage by 15 percent, reduce electric and natural gas consumption by a combined 15 percent, reduce fuel consumption by 15 percent and reduce landfill waste by 75 percent. The goal is for the reduction plan to be achieved by July 2016.

Most notably, the ODRC is concentrating on giving offenders the skills and knowledge to find employment after they're released. The state has implemented national programs, including Roots of Success, which provides an environmental literacy and job readiness curriculum for entry-level green jobs. Also, the state joined the Sustainability in Prisons Project, a network that supports local conservation efforts. At the state level, Ohio kicked off the Ohio Green Prison Project last year, which is a pilot project at the Ohio Reformatory for Women that offers courses in renewable energy technologies and vocational training.

About 28,000 individuals are released each year from Ohio's state prisons, according to the ODRC. Approximately 36 percent return within three years. What's more, the state's prisons are spending \$55 million on utilities alone every year. The ODRC hopes green educational programs will empower offenders while cutting down on energy bills. In his first experience working with prisoners, Hix wrote the program with the goal of employment after inmates served their time.

After completing each of the eight

buildings, Hix would conduct a refresher course for inmates that involved spending a couple of days in the classroom. He wanted to help answer any of the inmates' questions as well as help them stay up to date on what they completed and what they would be working on in the future.

At the end of the training, inmates received certification to install the SunQuest 250 solar panels. In an article about the project's July unveiling, the Associated Press reported that 29-year-old Shane Blackburn of Lucasville, Ohio, who worked on the project, was offered a job at Danville, Ind.-based PH Construction Development, which coordinated with the inmates to install the panels.

Prisons in Indiana and Maryland have also implemented significant solar panel projects. The Wabash Valley Correctional Facility in Carlisle, Ind., installed a \$75,000 system in 2011. The system, which consists of 15 flat panels supplying water to 200 people, is expected to save \$6,000 a year in energy costs and pay for itself within 15 years. In 2012, the Frederick County Adult Detention Center in Frederick, Md., installed solar panels to heat more than 2,500 gallons of water every day and is expected to save \$10,000 in annual operating costs.

For Hix, teaching inmates was a new and gratifying experience. Not only did he lead the instruction on a project that will help reduce natural gas usage and greenhouse gas emissions, he helped inmates gain valuable experience.

"Everything was outside the realm of what I had done previously in my life. I was a contractor and developed engineering for projects but never actually did anything that involved instructing in this atmosphere," Hix said. "It was astounding how much my eyes were opened."