



PROFILE OF SUCCESS

ENERGY STAR[®] Labeled Roof Products Case Study



A highly reflective elastomeric coating was applied to a gray modified bitumen roof, yielding increased occupant comfort, longer roof life, and substantial savings in a region of the country with low electric costs.

Our Savior's Elementary School
 Cocoa Beach, Florida
 White Elastomeric Coating from Kool Seal Corporation

Project Manager: Dan Fiore
 Facility Type: Elementary School
 Total Roof Area: 12,000 ft²

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| <i>Project Costs</i> | Total Expenditures | \$6,000 |
| | Dollars Per Square Foot | \$0.50 |
| <i>Cost Savings</i> | Annual Dollar Savings (not including value of increased roof life) | \$850 |
| | Dollar Savings Per Square Foot | \$0.07 |
| | Simple Payback Period | 7 years |
| <i>Energy Savings</i> | Annual Energy Savings | 13,000 kWh |
| <i>Pollution Prevention</i> | Annual CO ₂ Emissions | 22,300 lbs. |

Our Savior's Elementary School (OSES), a small private school built in the 1960s, is a single-story building in Cocoa Beach, Florida. Local temperatures often rise to a humid 95°F during the summer and drop to near freezing in the winter. Upgrading the school's 12,000-ft² roof by applying a reflective coating not only lowered the school's electric bills substantially, but also helped maintain comfortable indoor temperatures more easily.

In 1982, OSES' original roof was replaced with a gray modified bitumen roof. The dropped ceilings in the classrooms were insulated with R-19 fiberglass batts. The building also used an electric chiller to cool the air circulated throughout the building instead of a more typical but less efficient "direct-expansion" air-conditioning unit. Several characteristics influenced the building's energy performance

and economics. First, although the building was unoccupied for two of the summer months, the building's owners provided air-conditioning year round to protect the books and furnishings from mold and mildew. Second, the building's electricity was not submetered, and quantifying the school's actual energy consumption had been difficult. Finally, the non air-conditioned hallway between the classrooms had a vaulted uninsulated ceiling that frequently reached temperatures exceeding 90°F. To keep the hallway cool, classroom doors into the hallway were frequently left open. The school recognized the comfort issue, but upgrading this already energy-efficient building had proved difficult to justify based on energy cost reductions alone.

The Florida Solar Energy Center (FSEC) approached Marianne Brown, Principal, to learn if OSES would participate in FSEC's study on the efficacy of highly reflective roof coatings. Recognizing an opportunity to improve her school and also support energy research, she encouraged the FSEC project team to proceed, and assigned Dan Fiore, OSES Facility Administrator, to work with them on the project.

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¾ Marianne Brown

To establish a baseline for measuring energy savings and temperature reductions, FSEC began in May 1994 to record air-conditioning energy use and roof, plenum, and classroom temperatures for one year. When a simple white acrylic coating manufactured by Kool Seal Corporation was applied to the roof in May 1995, the reflectivity of the roof increased from 23 percent to 68 percent. FSEC then monitored the building for one year after the upgrade. They found that because of the reduced amount of heat entering the building, OSES' chiller's annual energy consumption had declined by an estimated 13,000 kWh, and its annual average electric power demand was reduced by 10 percent. Even more impressive was that during the period when electric power rates were highest (summer weekdays), peak electric power demand had fallen by 5.6 kW, or 35 percent. In total, OSES' roof coating was saving the school \$850 per year.

The school experienced these savings even though it was already using an efficient air-conditioning chiller and the prevailing electric rates were low. Not reflected in the net benefits, however, is the value of the increased student and faculty comfort because of lower classroom and hallway temperatures. “It made a tremendous difference, especially in the hallway. It used to be like a greenhouse in there from May through October,” Brown remarked on the improved classroom conditions, “We also wanted them to coat the roof because we believed it would reduce roof maintenance and lengthen the life of the existing roof.”

Fiore remarked on OSES' experience with energy-saving roofing products: “Our experience has been good with the roof coating. Thirteen years ago, I had an earlier opportunity to try out a reflective coating on our church, and the results were excellent. I would recommend to those considering a change in their roofing that they strongly consider reflective roof products, based on their low maintenance and strong performance.”

To learn more about ENERGY STAR[®] Labeled Roof Products, go to <http://www.energystar.gov>.
Or call the toll-free ENERGY STAR Hotline at 1-888-STAR-YES (1-888-782-7937)