

Sustainability in Action

We have been providing a Sustainability feature for the past two issues of *Shotcrete* magazine. We have attempted to explain the concept and define the registration and certification process for LEED projects. To help make the concept real and tangible to our readers, we are providing two examples of projects that demonstrate the sustaining qualities available when using concrete efficiently.

Example 1—Stapleton International Airport

Stapleton Airport in Denver, CO, served that community for 66 years until it closed in 1995. The property was transformed into a massive project consisting of mixed residential and commercial use. More than 975 acres of concrete pavement used for aprons, runways, taxiways, and access roads remained on the property. Most of that pavement was 2 ft thick. To build new structures, something had to be done with it.

A study by the Colorado School of Mines showed that concrete produced with aggregate from the recycled Stapleton pavement was equal to, or better than, concrete made with virgin aggregates. Additionally, the recycled concrete was used for base materials in the Denver area as well. More than 6 million tons of concrete pavement has been recycled into new uses.

Recycling of concrete pavement reduces the demand for virgin aggregates, extending the life of existing sources.

Example 2—Clearview Elementary School

At first glance, Clearview Elementary School, Hanover, PA, looks like most other schools of its kind. A closer

examination, however, reveals an important difference. The school was constructed with insulating concrete forms (ICFs) to provide dramatically reduced energy costs over the life of the building. The early estimates indicate an annual savings of \$34,000 due to the mass of the concrete and the insulating value of the forms. Additional contributions come from super-efficient ground-source heat pumps and radiant floor heating. These savings could increase as the cost of energy increases in the future.

Another feature of the project was the use of concrete mixture designs with high slag cement contents. Slag cement accounted for as much as 60% of the cementitious content for some mixtures. The use of slag, a byproduct of steel production, in the concrete mixtures provides an efficient use of a waste product.

The Clearview Elementary School project attained LEED Gold Certification upon opening in 2003. Project architect John Boecker of L. Robert Kimball & Associates said, “We set out for Clearview to be a place where students thrive and parents and taxpayers get the most for their money, both up front and over the life of the building.”

These projects are two great examples of sustainability as applied to construction projects. Reducing waste unnecessarily sent to landfills and using energy resources efficiently are two important ways of making the most of the limited resources available. The concrete industry has an opportunity to make major contributions to this effort.