The Harm A. Weber Academic Center is a recently completed green building at Judson University in Elgin, Ill. The 88,000-square-foot building houses the new Benjamin P. Browne Library and the Division of Art, Design and Architecture.

The designers have combined many innovative and green elements to create an energy-efficient structure that aims to achieve a Leadership in Energy and Environmental Design (LEED) Silver, or possibly Gold, rating.

Architects designed the building to take advantage of natural sunlight. The building’s exterior features photovoltaic panels and deep window pockets along the side that faces the sun. The solar panels absorb sunlight and generate electricity. The window pockets help prevent direct solar gain. As sunlight enters the openings, the pockets will also redirect it to the ceiling to create ambient and indirect lighting.

Concrete is featured throughout the interior and exterior of the building. The designers selected exposed concrete for ceilings, walls, and floors because the surfaces radiate warmth or coolness.

With reflectivity a critical feature of the design, polished concrete floors needed to perform well. The architect used the INDUROSHINE polished concrete flooring www.concreteconstruction.net  Summer 2008 CONCRETE SURFACES | 29 |
The flooring system produces a clear, high-gloss barrier that protects concrete.

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INDUROSHINE is an environmentally friendly, jobsite-friendly flooring system that combines concrete grinding and polishing equipment from VIC International with LIQUI-HARD concrete densifier and sealer from W.R. Meadows. When BEL-LATRIX premium concrete enhancer is applied to an INDUROSHINE floor, it produces a clear, high gloss barrier, offering optimum protection for concrete.

**How it happens**

Before the floor treatment process begins, the concrete surface must be clean, dry, and free of any contaminants. The concrete must be at 28 days old and must have achieved a minimum compression strength of 3500 psi.

Surface grinding is a two-step process. First, using a 40-grit metal bond, the contractor removes contaminants, starts leveling out the concrete surface, and removes surface imperfections. If the exposure of aggregate isn’t prominent, the contractor performs another grinding pass using the same metal bond or, alternatively, a lower grit metal bond.

Satisfied with the appearance, the contractor then uses a 150-grit metal bond to remove previous grit scratch patterns. Also at this time, the contractor can level the concrete floor to prepare for polishing.

The contractor applies a concrete hardener and densifier to the ground surface. The dense liquid is scrubbed into the surface using a broom or mechanical scrubber. During this treatment, the contractor must keep the surface wet, normally for at least 30 minutes.

At final scrubbing, the surface is then sprinkled with additional water. When fully applied, the contractor removes all excess water and hardener. The surface is flushed again with water after the application is completed.

It’s important to take proper care when applying the densifier. The clear liquid must penetrate into the floor so a chemical reaction can occur with the concrete. The reaction produces a byproduct that fills in the pores of the concrete, resulting in a substantially denser concrete surface. Along with creating a more durable floor, the densifying and hardening action solidifies the concrete crust, eliminating dusting and pitting.

Abrasion resistance protects the integrity of the floor and allows longevity, light reflectivity, and shine. It is easy to maintain this hardened surface and, with proper maintenance, will most likely last for the duration of the building’s life.

**The polishing process**

Once the floor is hardened, the contractor can perform a five-step polishing process. He first uses a 100-grit diamond resin polishing pad to remove prior grit scratch patterns. He then follows with a 200-grit diamond resin polishing pad to continue removing prior scratch patterns.

Judson University's architects chose a high-gloss finish created with a 3000-grit polish. They wanted a surface that would look wet and show mirror-like reflections of side and overhead images. They also found it to be aesthetically pleasing, featuring the highest amount of light reflectivity.

To accomplish this, the contractor removed scratch patterns with a 400-grit diamond resin polishing pad. This was followed with treatments from an 800-grit diamond resin polishing pad, a 1500-grit diamond resin pad, and finally a 3000-grit diamond resin polishing pad to create a high-gloss finish.

To protect the polished look, the contractor applied a water-based hybrid sealing compound, composed of unique materials that further enhance the floor's performance.
polymers, specifically formulated to provide the dual actions of penetrating and topical protection for concrete that has been previously densified. The material also offers immediate stain protection and produces a tough, uniform, breathable barrier for improved durability and abrasion resistance.

Sustainable design

The increased reflectivity of the polished floor may allow for lower intensities of lighting, which can reduce illumination costs. This is a key feature of the project.

The coefficient of friction and slip resistance for polished concrete floors exceed not only the OSHA recommendations for floors, but also exceeds the recommendations of the Americans with Disabilities Act.

While a regular maintenance/cleaning program is necessary, on the whole it requires less maintenance than other flooring systems. There are no replacement/reapplication costs and maintenance costs are low. Over 20 years, the costs for the polished concrete floor are less than half the costs of the alternates.

The materials used on the project were listed in BuildingGreen Inc.’s GreenSpec directory. The GreenSpec directory lists product descriptions for the top 5-10% of environmentally preferable products.

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