

• By Joe Nasvik



Top 20 Decorative



» THE HARLEY-DAVIDSON MUSEUM

When a visitor comes to the Harley-Davidson Museum, he should be looking at the Harleys—works of art themselves—not the floors. So the challenge was to draw attention to the motorcycles and not to the building elements. The museum still had to be high quality and classy, like a Harley. Diamond-polished floors would provide this with understated sheens, not gloss finishes. Visitors would be aware of the nice floor finishes, but their attention would be directed to the exhibits. To achieve this high-quality and desired affect, Harley-Davidson went through a careful construction process.

Choosing the contractors

Harley-Davidson is careful to build the best-quality product and their prices reflect that. So when the company decided to build a museum

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Projects of



in Milwaukee—where their corporate headquarters are located—they weren't looking for the lowest bid. They wanted contractors who understood quality the way they did, which led them to M.A. Mortenson, Minneapolis, and FloorCare USA, Milwaukee, for the diamond-polished floor treatments.

Ben Goetter, a project manager for Mortenson, says the project was a proposal-based selection process that included interviews. Harley-Davidson wanted a contractor who could work well with their team, deliver the level of quality they wanted, had the necessary experience and a good safety record, and could meet the schedule.

Brian Brunner, president of FloorCare, says his company installs epoxy floor coatings in Harley factories so they already had a working relationship with them. When he heard about the museum project, he started making inquiries to see if they could do the work. But that didn't stop Harley from initiating a nationwide search for floor finishing contractors—the criteria being a company who could provide the best service and the best finished results. When they were chosen, FloorCare and Mortenson began a three-year involvement, starting with initial planning and material selections.

Choosing decorative concrete

The architect for the project, Pentagram Architects, New York City, decided to show structural steel and provide an industrial look for the building. The decision to leave concrete floors exposed with a more natural finish worked with the building design. Polished concrete and dye-colored floors fit the theme as well.

Construction process

Goetter says they were involved in the design process with the architect and design team, including early meetings with Harley, estimating costs, preconstruction meetings with subcontractors, and the actual construction. Construction began in June 2007 and finished a year later. Brunner says their polishing work started in October 2007.

Mortenson placed and finished all the concrete for the project. Because of the building layout, they decided to set pipe screeds and hand-strike the fresh concrete, being careful to achieve the floor flatness requirements needed to achieve the demanding diamond-polished specification. The museum has slab-on-grade floors between 4 and 12 inches thick and deck floors that are 4 inches thick. Brad King, Mortenson's superintendent for the project, says they didn't know how much the decks would deflect under the weight

Those who visit the museum will spend up to a whole day looking at the motorcycles—their passion. Only someone who likes well-executed decorative concrete work will take the time to look at the floors. But, that's the way Harley-Davidson intended it. The floors have a dull-sheen gloss and a variegated, dark coloring that doesn't attract the eye. Photos: Joe Nasvik

Once again the editors of **CONCRETE CONSTRUCTION** magazine reviewed the decorative projects they received and chose the best of the best. This group represents the top 20 decorative concrete projects that portray what is happening in the decorative sector. The designs are more intricate each year and the use of multiple techniques on a single project has become standard. Harley-Davidson was voted our overall winner due to the complex techniques employed to reach the desired effect. Our remaining winners—the honorees—were equally as talented. At a time when jobs may be scarce, these contractors pulled out all the stops to show concrete at its finest. Turn the pages and see the beauty of concrete. When you're done there, go to www.concreteconstruction.net to see photos of the more than 70 entries.

of the concrete, so they chose to place even thickness concrete by setting the pipe screeds 4 inches above the steel decking. Pipe screeds for the slab-on-grade floors were set level by using laser levels. The flatness requirements for the job were $F_{p,35}$ for slab-on-grade concrete and $F_{p,30}$ for concrete placed on decks. But King says he thought they averaged $F_{p,50}$.

Brunner requested that concrete strength for the project be 4000 to 5000 psi in order to achieve the best polished effect. But the actual average for the job was 7000 psi. King says there was only about 450 pounds of portland cement in the mix but a midrange water-reducer was included for the slab-on-grade sections. Both a midrange and a superplasticizer was included for deck placements to increase the flow for pumping—slabs on grade were placed with a conveyor. Double mats of rebar reinforcing steel were placed in the slab-on-grade floors and welded-wire fabric reinforcement for the deck slabs. King says they finished the floors with walk-behind finishing machines (not riding trowels) and didn't hard-trowel finish them because the diamond-polishing process would remove approximately $\frac{1}{16}$ -inch of the surface in order to expose aggregate. When the finishing steps were complete, workers wet-cured placements for seven days; spraying water on the finished work and placing curing covers on top. King adds that they inspected the areas twice a day and added water if surfaces dried out.

Polishing to perfection

Harley was very concerned about their floors and finishes. When the polishing was complete, they wanted some aggregate to show, but not too much. They wanted the color of the aggregate and the concrete to be consistent throughout the project. This wasn't easy to do because floor placements occurred over several months. Agreements were made with the ready-mix producer, Sonag, Milwaukee, to use the same



gravel aggregate source, same aggregate size, and same color, and to keep the mix consistent. FloorCare provided Harley more mock-ups than usually would be considered to demonstrate both consistency and variation caused by noncontrollable issues. The panels also helped Harley decide how much aggregate they wanted to see after the polishing process.

Brunner says their first step was to approve floor flatness for each placement. Then they cleaned areas to be polished and started with either 60-grit or 80-grit diamond pads—test grinds helped them decide which to start with based on the hardness of the concrete. After the fourth polishing step, workers applied a lithium silicate and silicate hardener-sealer. For 30% of the floor, they sprayed a black dye carried in an acetone solvent at the second-to-last polishing step. Brunner says they were concerned about safety issues involving acetone so they conducted safety training, used sprayers that reduced volatility, and installed small batches at a time.

Floors were complete after an 800-grit polish and a final application of hardener-sealer using standard floor mainte-

nance equipment and nylon-grit buffing pads to produce the medium-sheen finish. Brunner says they use diamond grit embedded in stripping pads when gloss finishes are desired. A big challenge for FloorCare involved polishing and applying black dye to the underside of the main staircase, which is exposed to public view. Workers had to lay on their backs to do the work. He adds that it's very difficult to estimate the cost for this kind of work.

Joe Brunner, the project coordinator for FloorCare, brought the project in on time, on budget, and managed to exceed the clients expectations.

There is a lot excitement about this museum. For its grand opening, 150,000 Harley riders came to town for the one-week celebration. Bruce Springsteen played at the event and the concrete floors provided the perfect backdrop for it all. ■

Visit www.concreteconstruction.net to see additional pictures of the honorees, as well as the additional entries.

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2008's Best Projects

The Harley-Davidson
Museum, Milwaukee,
with subtle dark tones,
is CC's 2008 Decorative
Project of the Year