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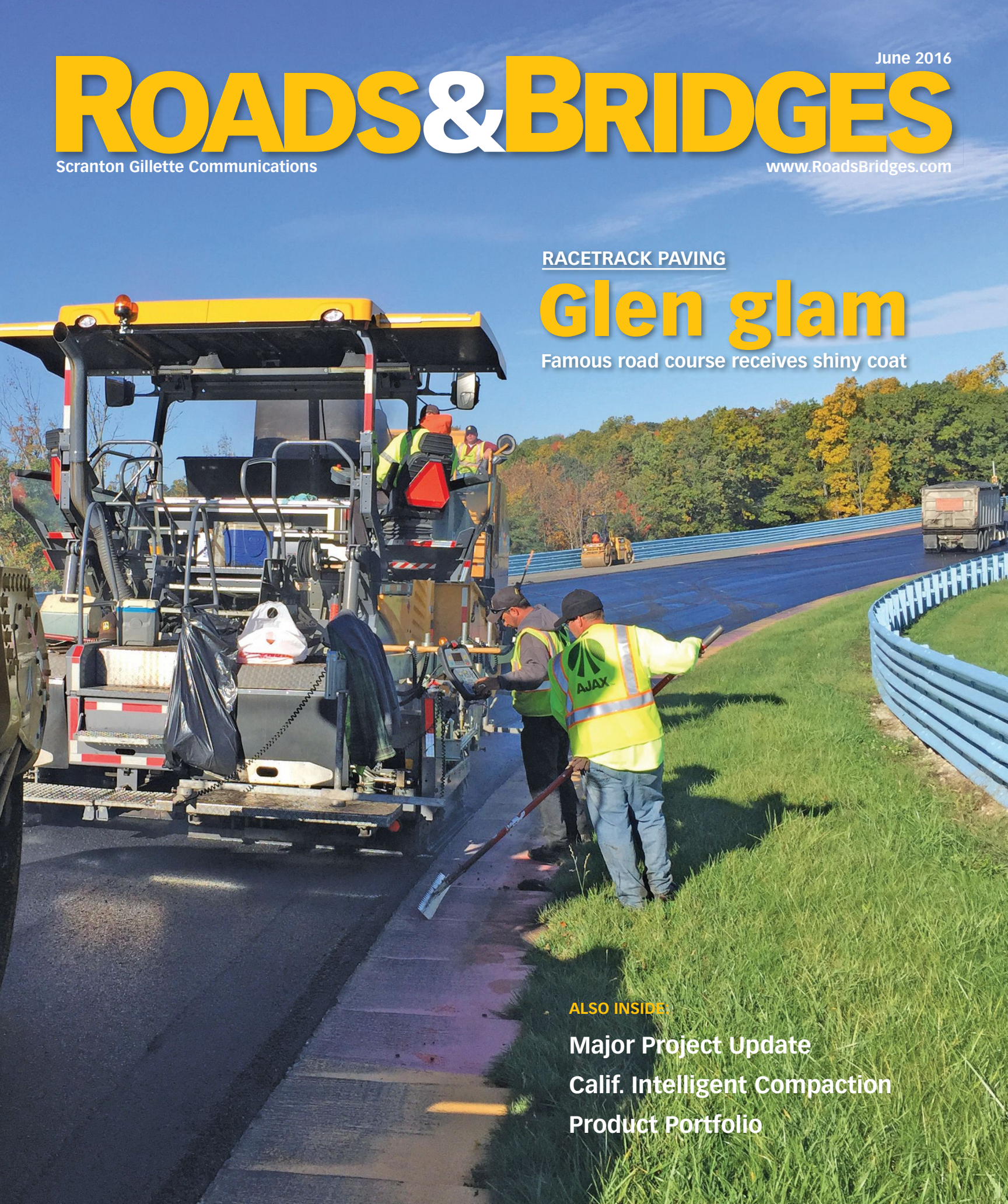


RACETRACK PAVING

Glen glam

Famous road course receives shiny coat

ALSO INSIDE:

Major Project Update

Calif. Intelligent Compaction

Product Portfolio

The beaded racetrack

Crews zero in on moisture damage at Watkins Glen

By Bill Wilson
Editorial Director

They did not travel long distances to see the weeping track. In fact, I doubt many racing fans in the New York region saw the strange phenomenon.

Asphalt pavement weeping happens when moisture collects in the sub-base and is pushed to the surface through a crack. Water on a racetrack is bad . . . very bad.

"You get these little beads of water and as soon as there is enough, they start to run all over the place," Marty Flugger, senior director of engineering for International Speed Corp. Design & Development, told Roads & Bridges. "All of our tracks are sloped and nobody likes to drive through a wet track. It causes issues when you have these weeping areas within the drive line."

Watkins Glen International, located in Watkins Glen, N.Y., was just a mess. Last reconstructed in 1998, sections of the asphalt track had been removed and replaced with concrete in the drive line running through the apex of the corners. The new sections varied in length depending on the corners. Some were as short as 75 ft, while others stretched as far as 300 ft. They were all about 12-14 ft wide. Over time, however, moisture caused settlement issues and spalling in the concrete. Most of the track at The Glen was suffering from some kind of water damage, and in some areas there was not a lot of asphalt left on the aggregate.

"So you had sections of the track that would actually start to peel apart," said Flugger. "You could kind of start pulling out sections of the track with just a brush. You could just sit there and start flaking out aggregate."

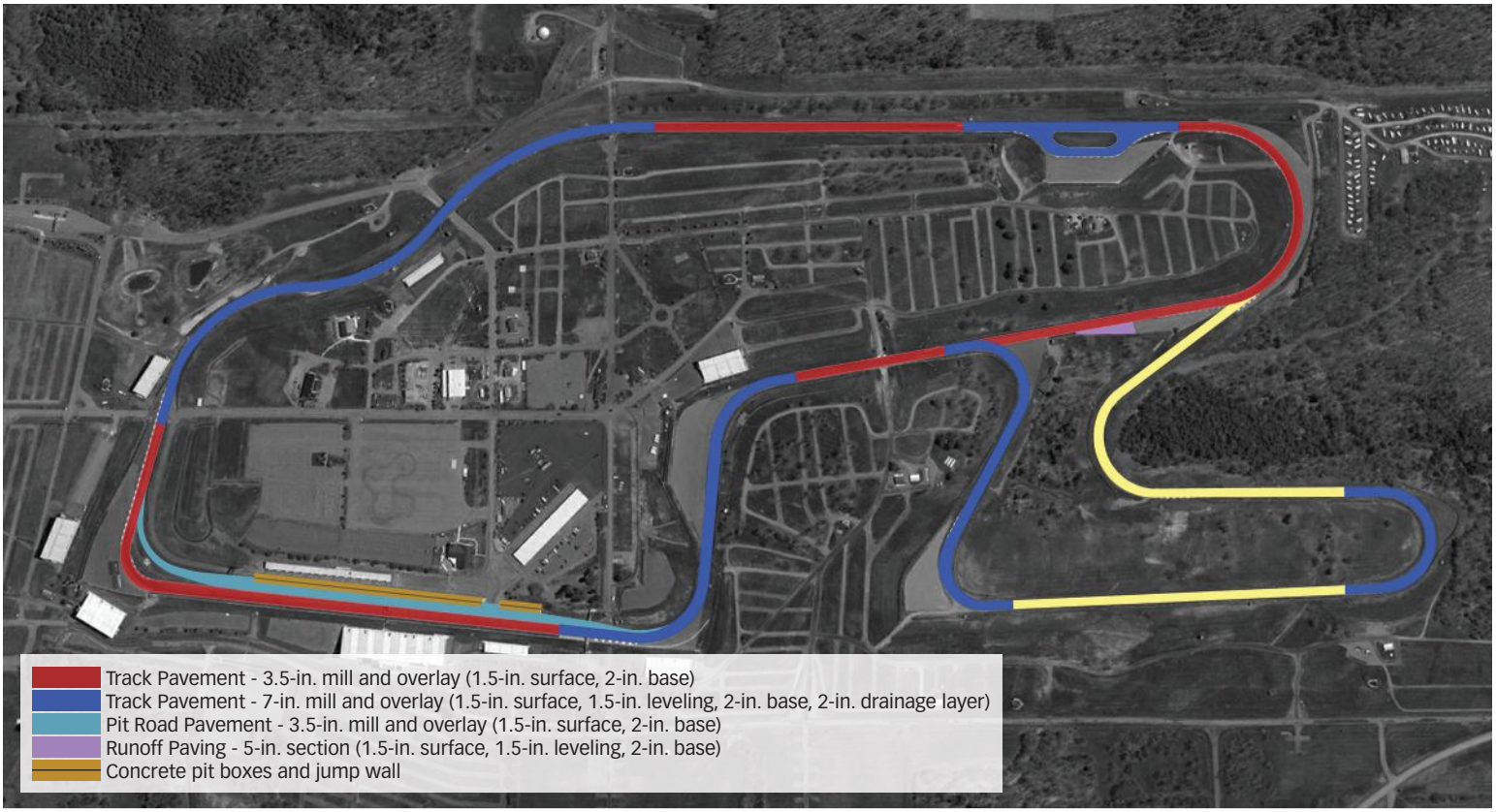
Thermal cracking slithered throughout the racecourse, and at the corners water had stripped the strength of the bond between the asphalt courses, leading to the track actually shearing as it was getting pushed into the corners as drivers were braking. Then you had the weeping.

Tight space, wide range of solutions

After receiving the green flag, crews from Kubricky Construction began demolition work on the concrete pavement and rumble

Above: Workers laying down asphalt at Watkins Glen International.

Below: Crews work to replace a water-damaged rumble strip at The Glen.



An aerial view of the work that was involved in replacing the Watkins Glen International racetrack.

strips in July 2015. Milling work followed, and a Wirtgen W 2100 removed a minimum of 3.5 in. of asphalt pavement. In areas where there was extensive water damage, another 3.5 in. was ground up.

Ajax Paving Industries, out of Troy, Mich., handled the asphalt paving operations, and when that kicked into high gear in August, the track took on the look of a one-sided solved Rubik's cube. There was little space to maneuver equipment—and one did not want to ruin a new and perfect section of asphalt. Portions of guardrail were removed in a couple of spots, but the solution only worked in certain areas.

"When you have a road course that is 38 ft wide with minimal shoulder, which is grass and then guardrail on both sides . . . it became very difficult to stage equipment and get your vehicles around the track [while] limiting the amount of traffic you have on the finished surface," said Flugger.

In some areas, however, crews had no choice but to break in the new pavement, usually after it had cured for five to seven days.

"As much as I fought it, we had to go on the surface course on a couple of occasions because there were some very long sections of the track and the shoulders in some of the areas . . . it was down to a foot between the edge of the track and the guardrail," said Flugger.

When crews knew working on new asphalt was going to be unavoidable, work was simulated on the leveling course (which was laid down before the surface course) and checked against the condition of the track.

"It gave us a real good test case," said Flugger. "We also had cool days, cool nights and were using a stiff binder. When you combine those things, we did not see any scarring [on the pavement]."

A Gencor counterflow asphalt drum plant, located about 20 miles away, supplied asphalt to the job. Sasobit was used to increase the workability of the mix, and production was scaled to match the material that was reaching the track on a particular day so there would not be a line of trucks waiting to dump. Flugger said the temperature of the asphalt at lay down was about 300°F. A Vögele AP 85 with an extendable screed set each mat. The asphalt mix varied slightly depending on the lift. Areas where the moisture damage came into play required a 2-in. open-graded friction course and a 1.5-in. base course. Those sections called for a PG 76-22 binder and aggregate as big as ½ in. The aggregate type used throughout was a manufactured quartzite with feldspar sand grains. After the open-graded and base courses were in place, a 2-in. leveling course and 1.5-in. surface course followed. Those

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Three rollers were used for compaction, and crews achieved density readings as high as 96%.

contained a PG 82-28 binder. In warmer climates a PG 82-22 is used on racetracks, but in the state of New York, temperatures can drop requiring a more "winter-resistant" binder. Where there were no water issues, just a 2-in. leveling course and 1.5-in. surface course were applied. The air voids in the mix ranged from 2.5% to 3.5%.

Crews also installed a drain tile around the perimeter of the track to capture the water from the drainage layer. This consisted of a 6-in. perforated HDPE pipe surrounded by drainable aggregates wrapped in filter fabric. The section of the drain tile was 12 in. wide and 3 ft deep, and was connected to the drainage layer in the track and to existing outfall structures around the track.

For the surface course, the Vögele AP 85 paved the first pass at 19 ft 5 in. wide in an

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Fact Finder

The three primary differences between highway pavement and racetrack pavement relate to heat, smoothness and "shoving," which occurs when a racecar is either accelerating or braking with significant turning force.

effort to get maximum density all the way to the edge of the mat. A Hypac C330B armed with a cutter would then remove ½ in. of pavement before an adhesive was applied and the remaining 19 ft of track was placed.

"As you are laying the mat and you have a free edge on the mat on the joint side, as you roll it, there is nothing that confines that edge. So as you are trying to get density on that edge, it tends to want to creep or push a little bit. This is why we cut it back," explained Flugger.

Three steel double-drum rollers were used for compaction. A Caterpillar 7030, operating in static and vibratory mode, handled the mat first and made one or two passes. That was followed by a Caterpillar 7044, which did one or two vibratory and/or static passes. The finish roller, a Caterpillar 7029, was just there for "clean up," according to Flugger. The average density achieved on the job was 95-96%.

Random density testing was done with a Troxler 4640-B nuclear gauge every 150-200 ft. An independent group and Ajax Paving conducted respective sets of tests. Core samples, about 10 per day, were pulled on the lower lifts.

"We would cut our cores, bring them back to the lab and check the actual density so we could compare it to the gauge," said Flugger. "That helps set the correlation between what the reading is to what it actually is. That really starts to hone in on that number, so when you do the surface all you really need to do is nuclear testing."

To check for smoothness, high-speed surface profiling systems were used on the base course. One was a pull-behind (SSI CS9200) and another was a truck-mounted unit (SSI CS9100). If any defects were detected in the base course, adjustments were made. Ride checks were conducted on the surface course. The smoothness target number was 8 in. per mile, but crews were averaging 5 to 6 in. per mile.

Most of the paving work was done by mid-October, and by January 2016 the concrete work was complete. The track officially opened in April.

"The feedback has been positive," said Flugger. "We put together a real good team up there. Everybody came together and put together a real good finished product." **R&B**

For more information about this topic, check out the Asphalt Channel at www.roadsbridges.com.

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