Meeting the Access Challenge

By Daniel C. Brown

Asphalt shows its flexibility for an urban arterial reconstruction

Try this project on for complexity, if you will. You need to reconstruct 2.32 miles of a five-and-six-lane urban arterial that has interchanges with two Interstate highways and driveway access from 200-plus businesses…and those accesses must be kept open during construction.

That's the job faced last year by Ace Asphalt & Paving Co. based in Flint, Michigan when the firm hired on as a subcontractor to Zito Construction. We're talking about the reconstruction of Miller Road, which is the largest commercial thoroughfare in Genesee County, Michigan.

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John Plamondon,
Genesee County Road Commission

The roadway has one of the highest traffic volumes of any road in the county, which is home to the cities of Flint, Grand Blanc, Fenton, and Burton.

Asphalt's flexibility

The Genesee County Road Commission (GCRC) chose full-depth asphalt for Miller Road for two reasons, said John Plamondon, construction manager for the commission. "We went with asphalt because we knew that it would give us the flexibility to maintain traffic in the ways we staged and phased it along Miller Road," Plamondon said.

"Secondly, we chose asphalt for the ease of future maintenance," Plamondon said. "Asphalt will minimize downtime for any future repairs of the road."

Ace Asphalt & Paving performed its work so well that the project won the company the 2008 Award of Excellence in the category of Projects over 50,000 tons, from the Asphalt Pavement Association of Michigan (APAM). "The Award of Excellence is our highest scoring project in each category, and this was our highest-scoring road project out of 40 total projects," Chuck Mills, APAM Director of Engineering, told *HMAT*. Four judges inspected the project and scored it in nine categories:

- Appearance: includes overall neatness, no overspray or left-over materials;
- Ride: must be smooth;
- Texture uniformity: free of segregation, major surface grinding, roller marks, etc.;
- Longitudinal and transverse joints: straight, well-blended, smooth and uniform;
- Edges: straight, uniform, true to the contour of the road;
- Utility covers: flush with the pavement;
- Approaches: blended well with the mainline pavement;
- Degree of difficulty: includes exceptional circumstances, maintenance of traffic, night paving, etc.

"Each judge gives the project a score for each of those criteria, and then we average the individual scores," explained Mills.

"We are absolutely happy with asphalt," said John Daly, manager/director of the GCRC. "We've had nothing

but positive comments from the technical teams that evaluated it, from area businesses, from the local governments we support and from Miller Road residents."

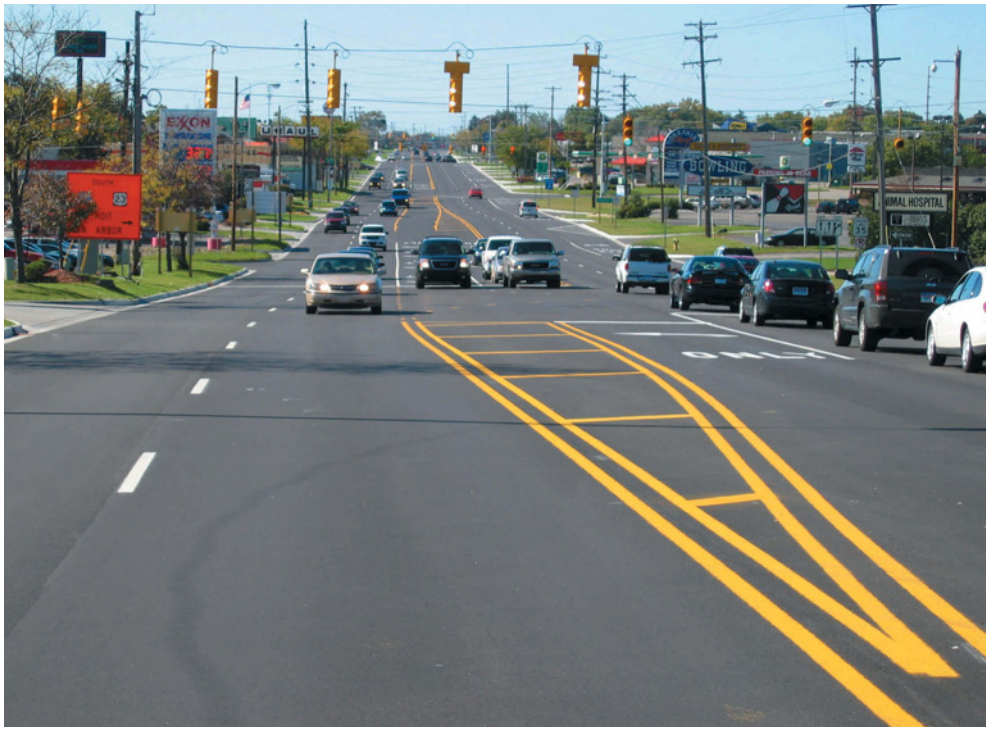

Photo: Asphalt Pavement Association of Michigan

Miller Road was completely reconstructed with 10 inches of full-depth asphalt.

Brief history

The original roadway, named M-78 in 1931, consisted of two 10-foot-wide lanes of concrete. According to GCRC project engineer Alexander J. Patsy, the road had been widened to four lanes, then to six lanes in piecemeal fashion from 1965 to 1975, in connection with business development. M-78 was transferred from the Michigan DOT to the county in 1970, in connection with the opening of the Interstate 69 freeway. Genesee Valley Mall opened in the early 1970s, which significantly boosted traffic volumes. Miller Road had been resurfaced at various times through the 1970s and 1980s, with the last one in 1989.

So in 2008, it was time to remove and replace the 2.32-mile stretch of Miller Road. "We had wanted to do the project for three years, but the issue was how to arrange the funding to pull this thing off," said Daly.

The GCRC spent nine months to evaluate funding options for the $10.45-million project. "We broke the project into seven components, and looked at three-tiered financing for each component," Daly said. "We evaluated all 21 options, and made the selection of seven sources of funding based on those sources that gave us the lowest cost of money.

"We wound up making use of funds from the state level, the county level, the federal level, and the Flint Township level, as well as from our own road commission," Daly said.

Complete reconstruction

Prior to the reconstruction, Miller Road had reflective cracking from the underlying concrete, severe transverse joint tenting (swelling), full-depth pavement failures, and standing water. A total reconstruction was needed.

The scope of the project included removal of the old concrete pavement and subsequent asphalt overlays, installation of sub-base drains throughout, an 8- to 10-inch aggregate base, typically 10 inches of asphalt, drainage structures, storm sewer, and new concrete curb and gutter. Other features, according to Patsy, included the installation of dual left turn lanes at I-75 for increased traffic capacity; the widening and resurfacing of the I-75 interchange ramps, traffic signal upgrades, and the designation of bus lanes and bus stops.

The prime contractor, Zito Construction, prepared the roadway for paving, said Mark Marshall, assistant general manager for Ace Asphalt & Paving. In several sections there were frontage roads parallel to Miller Road, so that made construction easier. But where no frontage roads existed, Zito would shift traffic to half the road, work on the other half, then shift traffic back to the completed half.

"We had to rebuild all of the approaches from businesses," said Marshall. When traffic crossed over the construction side, Zito set up temporary access crossings made of recycled asphalt or gravel. "We had to do half the road at a time," said Marshall. "Zito gave us staged areas to pave."

The asphalt cross-section consisted of two lifts of base course, totaling 6 inches, then a 2-inch leveling course, then a wearing course of 1.5 to 2.0 inches thick. The aggregate sizes in those mixes ranged from 100 percent passing 1 inch in the base courses to 100 percent passing the ¾-inch (0.75) sieve in the leveling course to 100 percent passing the ½-inch (0.5) in the top course.

Several mix designs

Marshall noted that Ace used nine different Superpave mixes on the project. "When we got close to I-75, we used a high-stress Superpave mix," Marshall said. "This was probably the highest number of mixes we ever used on any one project."

Ace paved the base and leveling courses in six stages during the daytime, then opened the road to traffic.

The base and leveling courses were paved at 10 to 12 feet wide, and the contractor used electronic automated screed controls on all lifts. "We used a non-contact ski on one side and a joint-matching tracker on the other side," Marshall said.

As the paver moved along on the base and leveling courses, Zito would take out the cross-ramps in front of the paver. After the paver had passed, Ace would place asphalt ramps by hand to move traffic onto and off of the new pavement.

Once the base and leveling course were down, Ace could pave the wearing course at night. "We would start at 7:00 or 8:00 at night, and pave until 6:00 or 7:00 o'clock in the morning," said Marshall. "We paved one lane wide for the whole length of the job, in one night. We did that to improve the ride, so that we didn't have transverse joints.

The project required 61,370 tons of asphalt. In some cases, old concrete from the project was removed, the steel extracted, and the concrete recycled as aggregate base on the project.

The Miller Road project also included 29,600 feet of new curb and gutter, 8,610 feet of new storm sewer and 181 new drainage structures, according to Patsy of the GCRC. This was the largest construction project in the history of the Genesee County Road Commission.

This was not a high-production asphalt paving operation. "The base and leveling course went pretty slow because we had to maintain access to the businesses," says Marshall. "We didn't have large stretches of road to pave. We'd have a half-mile, or three-quarters of a mile to pave in one stretch.

Ace did not use a material transfer vehicle to help with the paving. "In our state we can haul close to 50 tons in our trucks, so we can keep the paver moving at a consistent speed," Marshall says. "The traffic on Miller Road was pretty congested, to move our trucks in and out." He says the paver moved at about 30 feet per minute.

The road commission is very pleased with the project, which was completed in September 2008. "We were late by a week, but that's because it rained really hard the last week of the schedule," says Plamondon. "If it hadn't rained during that week, we would have been right on time."

Asphalt was the right choice at the right time, said John Niemela, director of the County Road Association of Michigan. "The county engineer's decision to use an asphalt pavement surface provided the greatest amount of flexibility in construction and yielded the least impact on motorists and businesses in this highly traveled corridor – a win for the commission, motorists, and the local economy," Niemela said. HMAT

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