

# ROAD CONSTRUCTION

**T**he reconstruction of 2.5 miles of the Grand River Road between Whitmore Lake and Brighton with 9-in. of high-performance concrete pavement marked the first time in more years than anyone at the Livingston County Road Commission can remember that concrete was used on a major road project.

Road agencies are choosing concrete over asphalt for several reasons, principal among which are life-cycle cost, speed of construction and low maintenance.

“Life-cycle cost analysis tipped the scale for Livingston County on this project,” said Jim Marcinkowski, the consulting engineer on the Grand River project from Orchard, Hiltz & McCliment Inc. (OHM) of Livonia, Mich. “Project costs were close between concrete and asphalt, but the longer life cycle of concrete and its low maintenance cost made concrete the better choice for this project.”

Fluctuations in oil prices and modifications in the refining process have skyrocketed asphalt job pricing, said Dan DeGraaf, executive director and chief executive officer for the Michigan Concrete Paving Association. Because most state, county and municipal projects are designed and bid over a several-month period during which the per-ton price of asphalt can double or even triple, budgeting for an asphalt project has become tricky at best. DeGraaf pointed to the experience of many agencies who this past summer were forced to cancel several asphalt jobs because of the higher price.

DeGraaf said this is not unusual.

“It’s happening all over the country. The dramatic swings in oil prices make asphalt an extremely unstable pricing product as road agencies and contractors attempt to estimate road

construction costs,” he said. “Concrete prices, on the other hand, have remained stable and price competitive with asphalt. Factor in life-cycle cost analysis, and concrete is the real bargain for road agencies today.”

## Large body of challenges

In the case of the Grand River Road project where the road had undergone numerous repairs over the years dating back to the 1920s, Livingston County was looking for a long-term fix that would fit within their budget constraints. They elected to go with concrete.

Prior to the start of reconstruction in March 2008, the condition of the road had deteriorated to a point that a complete reconstruction was necessary. The old pavement would be removed, and the existing base would have to be replaced.

“It was an extensive job that we knew would consume a major portion of our local road funds and several years of federal aid,” said Mike Craine, Livingston County Road Commission managing director. “We saved for three years for this project.”

The \$8.1 million reconstruction included widening sections of the road to three, four or five lanes depending on traffic patterns. New concrete was installed on the segment between northbound U.S. Rte. 23 and Pleasant Valley Road. A half-mile of the roadway between the Brighton city

limits and northbound Rte. 23 was milled and overlaid.

“We needed more capacity and we needed a durable long-term fix that would require minimal maintenance,” said Jodie Tedesco, project engineer for the Livingston County Road Commission. “We went with concrete because it was price-competitive and gave us a longer service life. We didn’t want to have to come back in a few years to reconstruct the





# PERSONAL **check**

*Livingston County, Mich., takes pride in work after saving for three years*

road again. We knew concrete would give us the fix we needed.”

One of the challenges going into the project was to address questions of drainage and runoff. As-built plans dating back more than 80 years were provided by the Michigan Department of Transportation, the original

owner of the road. The plans identified numerous utilities beneath the existing road. Constructing a drainage system posed a potential problem for both the county and the contractor, unaware of what they would find once the old road was removed. Fortunately, the contractor was able

to build an adequate drainage system under the center of the new roadway without disrupting utilities.

“This contributed significantly to the speed with which the project was completed,” said Marcinkowski.

Five lakes surround the reconstructed highway, contributing to





**The intersection had to be raised nearly 3 ft and widened for improved turn lanes. The new design would affect businesses in the area by raising driveway entrances above existing parking lots.**

poor soil conditions in some areas. In one 30-ft by 100-ft section, special geotech liners were used to secure the banks adjacent to the road.

“Because it is a marshy area, we took precautions to construct adequate reinforcements where needed and made sure our storm-water drains could handle the runoff in the area,” Marcinkowski explained.

Another challenge involved routing traffic through the work zone during construction. Grand River Road is a major arterial carrying more than 20,000 commuters a day. During the three phases of construction, one lane of traffic in each direction was maintained by constructing an adjacent temporary roadway within the existing right-of-way.

“We were blessed with good weather, and due to the efficient work of Six-S, our contractor, we were able to complete much of the work ahead of schedule, minimizing the inconvenience to motorists,” Craine explained.

### **Raising solutions**

Accomplishing the reconstruction of Grand River as quickly as possible

was critical for Livingston County. Their traffic projections showed that utilization along this corridor is expected to top 30,000 vehicles per day within the next 20 years. Timing was right, explained Craine.

“We needed to get it done now knowing there would be some disruption to businesses along the 2.1-mile work area for a short period of time, but we knew the improved facility would serve our long-term needs and actually improve business access in the future. During actual construction, we were concerned but determined to keep congestion and business disruption to a minimum.”

Reducing lane utilization in a heavily populated area for over six months can be challenging for both county officials and contractors. Keeping traffic flowing, while staying on schedule, is a big job that required constant interaction among the stakeholders.

“Jodie Tedesco, county engineer, and Michael Craine, managing director for the county, worked closely with us to keep this project on track,” said Tom Wall, Six-S project manager. “They were immediately available

for any problem that came up. It also really helped to have an experienced lead inspector from the county like Fred Marr. It keeps the project on track and minimizes delays.”

Initial concerns were that the project would be drawn out over the entire 2008 summer construction season. There was speculation that a lengthy construction period would draw public criticism. Craine mentioned as an example the intersection of Pleasant Valley Road and Grand River where major renovations would be necessary to meet AASHTO safety standards. Sight distances were poor, and the potential for accidents was acute. The intersection had to be raised nearly 3 ft and widened for improved turn lanes. The new design would affect businesses in the area by raising driveway entrances above existing parking lots. This was a major undertaking that potentially could have drawn out the construction period for several weeks. Craine said the county worked out the details, and the reconstruction was completed quickly with minimal problems.

“The new intersection, as designed

and built, greatly improves nighttime driving visibility and safety along this section of roadway," said Craine.

According to Wall, with the exception of minor cost increases associated with upgrading the water-main system, the project was completed ahead of schedule and under budget.

"We even did extra work like upgrading the utilities to avoid the possibility of future problems," Wall explained. "Doing it right the first time was something both the county and we agreed upon up front."

### Just grand

Wall said this was one of Six-S's largest projects from the aspect of working with the public. Six-S Corp. is based in Waterford Township in Oakland County and is a major contractor in the area.

"We are pleased that the project

went well. The public is happy with the results, but it helped keep public opinion positive by staying on schedule, or even a little ahead," he said.

In the first phase of the three-phase project, it took Six-S just six days to pour concrete on the 2.1 miles of reconstruction. The contractor used multiple pieces of equipment, including three different slipform pavers each set to a different width (one-, two- and three-lane widths). In addition to the upgraded water system and the installation of improved storm sewers and retaining walls, the contractor installed new signalization and curb and gutter. The roadway was constructed on a much faster timeline than would have been possible had the county elected to use asphalt pavement primarily because asphalt construction requires a deeper base, which increases the potential for utility conflicts.

Prior to reconstruction, 90 years of pounding traffic, environmental weathering, overloaded trucks and short-term fixes left the road strewn with potholes and spider-web cracks that made for a very bumpy ride. What a difference the new road has made. Wall said motorists have been very vocal about the quality and aesthetic beauty of the new and improved Grand River Road. In Wall's words, "it's like night and day." 🚗

Information for this article provided by the Michigan Concrete Paving Association, Okemos, Mich.



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