

PIT & QUARRY

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RECYCLE CENTER

On-site processing keeps project trucking along

The Kansas Turnpike Authority (KTA) recently undertook a unique approach to reconditioning its tollway between Lawrence and Kansas City. Enlisting a team concept with several contractors, the project consists of milling asphalt for reuse as RAP in new asphalt; removal and recycling of portland cement concrete pavement into reconditioned subgrade; and laying 18 in. of full depth asphalt over the recycled subgrade.

Henningsen Construction Co., based in Atlantic, Iowa, served as general contractor on the project and was responsible for overall project management and placement of the 18-in.-deep asphalt. Recycled Materials Co., based in Denver, was the primary subcontractor responsible for removal and processing of the concrete pavement and preparation of the subgrade. Koss Construction Co., based in Des Moines, Iowa, was responsible for milling the existing asphalt road surface for reuse in the new asphalt.

The project was broken into two phases. Phase I began May 2, 1994, and involved recycling approximately 5 miles of the westbound lanes. This phase was completed Aug. 1. Preparations started on Phase II, which involved 5 miles of eastbound lanes, on Sept. 3. At presstime, overall project completion was slated for Nov. 1.

"This is the first project KTA has employed the use of recycled materials," said Tom Wurdeman, a KTA division engineer.

The project offered some surprises. When removal of the concrete road surface began, the subgrade was found to contain clay, be of poor quality, have high moisture content and be very unstable.

Recycled Materials Co., responsible for removing and processing the existing concrete and subgrade preparation, faced the challenge of providing a quality recycled subgrade from the poor conditions which were found.

"Originally, the subgrade was to be

an aggregate drain layer, but, due to the instability of the subgrade, the project was changed to incorporate 6 in. of processed concrete into 6 in. of subgrade to make 12 in. of stabilized subgrade. The lime, cement and absorbent recycled concrete served to dry out the wet subgrade and stabilize it," said Mark Wachal, general manager for Recycle Materials Co. "An added benefit realized from the recycled stable subgrade was the ability for it to hold truck traffic while hauling and paving. The subgrade maintained its integrity."

The company used a unique approach to recycle the broken, removed concrete all on the grade. A self-contained, track-mounted Hartl impact crusher complete with feeder, magnet to separate the rebar from the broken concrete and on-board conveyors processes the demolished road surface into recyclable aggregate for the new subgrade. As the demolished surface is removed, it is fed directly into this mobile recycling plant. The unit tracks behind the hydraulic excavator that is removing the old broken concrete. Rubble is not trucked to a remote location to be recycled/processed.

"We process the rubble, separate the steel rebar and windrow the finished product all on the grade," said Wachal.

Access to the project is very restrictive due to the logistics of the project—routing traffic to the eastbound lanes while recycling the westbound lanes during Phase I and reversing

this order for Phase II. Being able to eliminate truck haulage to and from a remote processing site greatly enhanced traffic flow on the project site.

Roughly 100,000 yd³ of material will be excavated and 80,000 st of demolished concrete recycled when the project is completed. A significant amount of steel reinforcing wire—200 tons—will also be generated from the recycling effort. The asphalt millings, concrete and steel removed from the old road surface will all be recycled.

When the subgrade is complete, 18 in. of full-depth asphalt will be overlaid. The asphalt consists of multiple lifts: 4 in. of Kansas Department of Transportation (KDOT) specification BM-2 containing 50 percent RAP directly on the subgrade; 4 in. of asphalt coated open drainage; 8 in. of KDOT BM-2C containing 20 percent RAP; and the top 2 in. of BM-1B surface coarse made from virgin materials.

The project was a very goal-oriented, cooperative team effort between KTA, Henningsen Construction, Recycled Materials Co. and Koss Construction.

"Recycling on this project has been a great success," said Wurdeman. ■



Recycling removed concrete on the grade helped reduce the traffic conditions caused by closing half the lanes during each phase of construction. Removed concrete was processed through the self-contained, track-mounted impact crusher. As the demolished surface is removed by the excavator, it is fed directly into the mobile recycling plant.