



Project Spotlight

US 69 Bonded Concrete Overlay Pittsburg County

Oklahoma Department of Transportation engineers in southeastern Oklahoma's Division Two had a perplexing problem. Seems every three or four years they were faced with another resurfacing project on a stretch of US 69 just north of the City of McAlester. This important north-south route takes a pounding from heavy truck traffic that is somewhere in the neighborhood of 25% of Average Daily Traffic (ADT). Combined with the additional stress placed on the existing flexible pavement due to the hilly terrain and poor subgrade soils, this volume of truck traffic overloaded the existing pavement and had become a perpetual problem. After resurfacing, it seemed that in no time at all severe rutting and shoving would once again develop.

Project Name: US 69 BCO, Pittsburg County
Design: 4/6" Bonded Concrete Overlay
Year Constructed: 2001
Design Engineer: John Winters

What to do? This question had been asked over and over again until one day came a revelation. Concrete! Concrete can solve our problems. Concrete doesn't rut or shove. Concrete will last. However, funding for new a construction project could take years to get making a resurfacing project the only immediate solution. Could a concrete paving project be designed that could be financed using

limited funds available through a maintenance contract? Why not try? Division Construction Engineer John Winters and Division Maintenance Engineer Calvin Carney thought it was worth a try and that is precisely what they did. Winters came up with the idea while reading about a thin concrete whitetopping project being done on I 20 in Mississippi and took the idea to Carney who was willing to dedicate maintenance funds to the project.

Using WinPas pavement design software, Winters came up with a thin concrete overlay that was projected to last at least twelve years. A thickness of six inches would suffice for the driving lane and based on the theory that the passing lane carries only about twenty percent of truck traffic he was able to further reduce the passing lane thickness to four inches. In order to move the unsupported edge of the driving lane away from traffic, the driving lane width

was increased to fourteen feet. A class 'A' concrete mix was specified with #67 stone and required to achieve 3,000 psi compressive strength in 72 hours or prior to opening to traffic. The 28 day strength was specified to reach 5,000 psi compressive strength. Polypropylene fibers were added to provide secondary reinforcement.

In order for the differing pavement thicknesses to properly match at the longitudinal joint, two inches of asphalt was milled from the existing passing lane and two feet into the outside shoulder. The passing lane was milled just enough to scratch the surface to improve bonding ability. Transverse joints were sawed every six feet and longitudinal joints were sawed in the center of each lane.

Construction was sequenced so that the milling material removed from the driving lane was used to widen the inside shoulder and used as a detour while concrete was being placed for the driving lane.

Due to the thin nature of the pavement, early sawing was critical. A double application of curing compound was applied to the surface to better retard moisture loss during the cure period. After cylinder breaks achieved the required 3,000 psi, traffic was switched to the newly constructed outside lane and concrete was placed for the passing lane. Once the paving for the two lanes was complete and opened to traffic, the inside four-foot shoulder and remaining eight feet of the outside shoulder were overlaid with asphalt by ODOT maintenance forces. All work was performed without the construction of crossovers so the presence of an Oklahoma Highway Patrol officer during working hours was welcomed.

The length of this project is approximately one and one-half miles of the southbound lanes only. It was completed in September 2001 and is still in service and performing well.



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