

A HARD ROAD

Concrete paving wins converts

BY MICK PRIEUR

Concrete paving has long been the method of choice in road construction in many areas of North America. The reasons vary from region to region, but include life-cycle cost, initial cost, durability and many environmental factors.

In the southern U.S., many of the roads are concrete due to requirements for performance and durability related to the temperate climates. However, moving further north in the US and into Canada, it becomes more difficult to rationalize a concrete road simply on long-term performance and durability.

The reality is that road paving in these regions is determined more by initial cost alone than by regard for the long-term benefit to the taxpayer. The dynamics of this thinking are slowly changing. Social, environmental and economic pressures on infrastructure development and rehabilitation are driven by the need to maintain healthy economic growth.

The economics have substantially changed. Fluctuations in the price of oil and increasing aggregate costs are pushing the cost of asphalt cement upwards. Today, concrete paving can compete effectively on first cost. The aggregate factor is a combination of both costs—from the reduced need for use under a structural pavement to the reduction on environmental footprint of acquiring new aggregate sources.

The use of concrete pavements is slowly growing in Ontario, and municipalities are taking notice. In the last several years, the Ministry of Transport in Ontario has tendered 10 alternative bid projects (based on a limitation of traffic volume of one million ESALs (Equivalent Single-Axle Loads)). All of these projects have gone



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to the concrete option based on initial cost. In 2012, under the direction of Minister Bob Chiarelli, the Ministry of Transportation has reduced the limit for alternative bid contracts from one million ESALs down to 500,000 ESALs. This reduction in limits has allowed MTO to start evaluating the use of concrete roads on more of its network.

Municipalities are also starting to use more concrete. While cities like Toronto and Windsor have been using concrete for many years, other cities are still getting their feet wet. The city of Hamilton has many concrete roads around its industrial areas that were built 15-20 years ago, but now they are paving more roads with composite pavements as well as some conventional concrete. Other counties and regions around the province are looking at concrete as well. In 2015, there are already four projects on the books, with potential for others.

The city of Toronto has been using concrete pavements for many years. It is estimated that 80 percent of Toronto is composite pavement. The city uses a composite pavement system to get the long-term durability of concrete while using asphalt as a sacrificial →

surface that can be easily repaired once the skid resistance has deteriorated. In recent years, the advancement of diamond grinding and diamond grooving of concrete pavements has provided an alternative to the traditional sacrificial asphalt layer that eliminates the risk of potholes and rutting from the asphalt.

The city of Hamilton has also started to use concrete a lot more. In the heavy industrial area around the old Stelco and Dofasco plants, there have been concrete pavements for more than 15 years. Most recently in 2013, the city of Hamilton has reconstructed a portion of Burlington Street East. This section of road was a composite pavement that was near the end of its life. The city decided to reconstruct it as an exposed concrete pavement.

Since 2009, the city of Hamilton has used an alternative bid program where a portion of their projects have both concrete and asphalt in the tender. The market can then price whichever option they prefer. In 2011 and 2012, approximately 50 per cent of their reconstruction projects have gone concrete, usually as a composite pavement. The city is seeing savings with the concrete due to needing less pit-run granular materials. Another savings is in the bid cash allowance. Since the price of concrete is fixed, with

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no escalator clause, the city does not need to have such a large contingency fund.

In 2014, the Region of Waterloo tendered an unbonded concrete overlay. The project is a 1.2-km. section of Spragues Road just south of Cambridge. This is a two-lane section with residential and commercial businesses on it. It is an old MTO road that had asphalt overlaid onto a concrete base.

The asphalt is in poor condition and the region has decided to reconstruct the road. The original plan was to remove the asphalt and maybe the concrete, backfill with granulars and then cap it with hot mix asphalt. The original plan would have raised the road profile by 100 mm or more.

The project was reviewed by Ready Mixed Concrete Association of Ontario and an alternative was suggested. By removing the poor quality asphalt, repairing any shattered concrete slabs and then placing a 25-mm asphalt overlay with an exposed concrete pavement on top, there would be only slight changes to the road profile. By using the existing concrete base the project was expected to save the region money not only for the pavement but also by removing the need to increase the width of the platform.

The project was tendered at the end of July, with three qualified bidders. Capital Paving was the lowest bidder at \$1,475,000 and



Growing recognition by MTO and the municipalities augurs well for concrete paving.



was awarded the project. Miller Paving has been subcontracted for the concrete work which will start in the spring of 2015, and should take approximately four days to complete.

The City of Windsor has been constructing concrete pavements for years, with the recent Parkway project being constructed from concrete pavements. The County of Essex has been tendering sections of County Road 22 for several years. In 2015, they will be constructing a concrete roundabout. The project was tendered in September of 2014, with Coco Paving being awarded the \$3.3 million project.

In 2015, expect to see more concrete pavement tenders coming out. Some regions are commenting that their intersections are not lasting as long as they should. At least one municipality has stated that they will be tendering a concrete intersection in one of their high-traffic areas. If the trial project goes well, they will be replacing many more.

The recognition by MTO and some of the forward-thinking municipalities demonstrates that the movement toward the use of concrete roads is not just a blip in the construction field. Instead, it is a smarter approach in the use of infrastructure dollars based on life cycle costs, durability and long-term performance. More importantly, concrete roads compete well on initial cost. □

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