CASE STUDY

BONDED CONCRETE OVERLAY CITY OF EDMONTON

THE CHALLENGE

170 Street at 118 Avenue in the City of Edmonton is subject to very heavy truck traffic, which led to severe rutting of the original asphalt surface. According to Hugh Donovan, P.Eng., Construction Services Engineer with the City of Edmonton, a bonded concrete overlay "was chosen because traffic volumes coming into this intersection are some of the highest recorded within the City of Edmonton". In the past, milling and filling the intersection approaches proved unsuccessful in combating the rutting problem. Rutting would again showup within months of the work taking place.

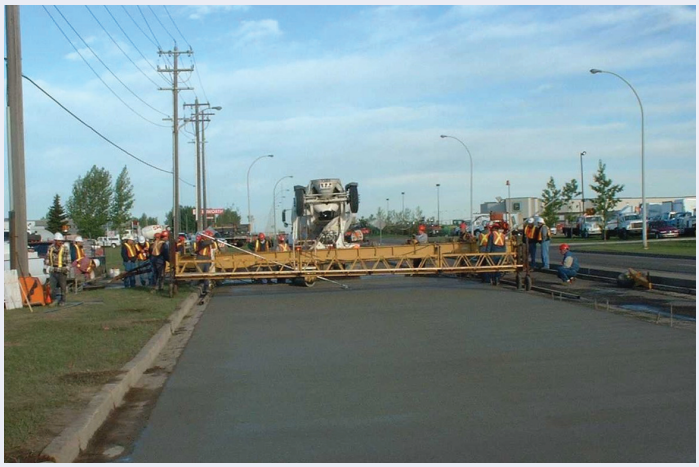
THE SOLUTION

Hugh Donovan proposed that some form of concrete pavement would give the best opportunity to combat the rutting problem. As a result, a bonded concrete overlay was chosen in part because construction could be carried out over the course of a weekend with the least amount of disruption to normal traffic flow.

PROJECT DETAILS:

- Two lanes (east and west) and turning lanes paved with a bonded concrete overlay.
- Design thickness 100 mm of concrete; actual thickness varies from 95 to 120 mm of concrete.
- Remaining asphalt thickness 240 mm after milling out deteriorated asphalt.
- Compressive strength 20 Mpa in 24 hours and 35 Mpa at 28 days.
- Polypropylene structural fibres utilized.
- Joints sawcut in 1.8 m square panels.
- Contractor: Lafarge Construction, Materials Construction Division.
- Concrete supplier: Lafarge Construction, Materials Ready Mixed Division.

Before construction



During construction

After construction

WHAT ARE BONDED CONCRETE OVERLAYS?

A bonded concrete overlay is a pavement maintenance and rehabilitation strategy in which 50 to 100mm of concrete is bonded to the underlying prepared asphalt surface. The bonded concrete overlay technology originated in the United States with construction of a test section in Louisville, Kentucky in 1991. Since then, numerous agencies across Canada have used bonded concrete overlays as a pavement rehabilitation option.

BONDED CONCRETE OVERLAY DESIGN

The design secret how the concrete bonds to the asphalt which creates a composite structure that maximizes the strengths of each material. The concrete provides a durable, non-rutting surface that easily handles compressive stresses while tensile stresses are reduced due to the underlying asphalt. The rough asphalt surface texture, and freshly fractured aggregates left after milling, provides a good surface to which concrete can bond. The concrete is placed directly onto the clean, dust free milled surface. If jointing of the overlay is necessary, panel size may range from 0.6m to 1.8m depending on the thickness of the bonded concrete overlay.

WHY USE BONDED CONCRETE OVERLAYS?

- No rutting and reduced chance of hydroplaning.
- No potholes.
- Eliminates shoving or movement of traffic loop detectors, leading to longer life.
- A light reflective surface increases visibility. Various durable surface textures may be used.

Sawing panels

Finished product

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