

INFRASTRUCTURE

SPRAGUES ROAD REHABILITATION

Region of Waterloo



PROJECT CREDITS

OWNER

Region of Waterloo

GENERAL CONTRACTOR

Capital Paving Inc.

CONCRETE PAVEMENT DESIGN

Applied Research Associates, Inc.

CONCRETE PAVING SUBCONTRACTOR

Brennan Paving & Construction Ltd.

MATERIAL SUPPLIER

Hogg Fuel & Supply Ltd.

ADDITIONAL PARTICIPANTS

- Amec Foster Wheeler
- Euclid Canada
- Lafarge Canada Inc
- LIUNA Local 1081

PROJECT FACTS

LOCATION

North Dumfries, Ontario

PROJECT TYPE

Road Reconstruction

CONSTRUCTION TIME 35 days

AMOUNT OF

CONCRETE PAVEMENT 1,700 m³

LENGTH OF CURB AND GUTTER 135 m

LENGTH OF DETOUR 15 km

ROAD LENGTH 1.2 km

NUMBER OF TRAFFIC LANES

2 (3.35 m)

NUMBER OF BIKE LANES

2 (1.5 m)





Concrete. An Essential Element for Construction.

The Spragues Road Rehabilitation project is a 1.2 km urban road owned by the Region of Waterloo. At the south boundary of the project is the Brant/Waterloo boundary road and Wrigley Road is at the north boundary. The existing road is a two-lane urban section with paved and gravel shoulders. The traffic is approximately 8,386 vehicles per day with 8% trucks. This is a main traffic route between Paris, Ontario and Cambridge.

In the initial investigation it was determined the road was a composite section with approximately 180 mm of concrete base (170-190 mm) with up to 180 mm of asphalt on top (130-180 mm). The base is 0-500 mm of sandy silt or silty sand. The asphalt condition was in poor to very poor condition.

Construction

Mobilization of the site started on May 4th, 2015 starting with installation of a temporary lane using the existing shoulder plus an additional 300 mm of widening. Once the temporary shoulder was constructed a temporary concrete barrier was placed along the embankment to protect the drivers. Traffic cones were used between the construction and the live traffic. Rotomill was subcontracted to mill the existing asphalt from the surface to the appropriate depth needed to correct the profile. Once the milling was complete, Capital Paving placed the HMA padding and the 30 mm HMA separation layer.

Brennan Paving then placed the 160 mm concrete overlay over 3 days. During the concrete placement approximately 20-24 hours after placement, Capital Paving reinstated all driveways for local residences and businesses. Once the North bound lanes were constructed the staging was then moved over to the southbound lanes and the process of milling, HMA and concrete placement was repeated. Once all the concrete pavement was placed the guide rails, 100 m of curb and gutter, the RAP and HMA shoulders were installed. Lastly, the road was cleaned and the Methyl Methacrylate MMA line paint was installed. The region decided to use a black silhouette around the yellow and white lines to make the lines more distinct.

Traffic Management

In order to construct the road there were many traffic management considerations. The existing road is a two lane road with a single northbound and a single southbound lane. It was decided during the planning stage that northbound traffic will be allowed during construction and southbound would be completely closed during construction.

Maturity

Maturity methods were used in order to get local residences access as soon as possible. Using maturity it was determined that the specified strength of 20 MPa was reached in approximately 15 hours after placement. The field cure cylinders on average took 4 hours longer to reach strength than the maturity tests.

Final Product

Once the concrete paving was complete, Capital Paving completed the shoulder work and the installation of the guide rails. Lastly the lane striping was installed and the final product looks amazing!

What we learned

Overall, the project went very well. The most difficult challenge was due to the narrow work space. Having only two narrow lanes to work with made staging that much more challenging. The most difficult part was the closure of the Southbound lane. There were residences and a school within 150 meters of the north end of the site but the people going southbound had to take a 15 km detour to go the 150 m.

Conclusions

For this project, concrete was an essential element for the construction. Not only was new concrete placed on the surface, but the concrete that has been there for decades was also utilized in the design. The unbonded overlay option was a great option for the Region. It saved them 20% over the best proposed alternative.

By using maturity methods, the project was kept on schedule with minimal impact to the local users of the road. The contractors were able to keep the local residences and businesses in operation with minimal disruption.

This was a challenging project due to the tight geometry, but the specification documents were well made and the contractors involved did an excellent job keeping the project on schedule with very high quality workmanship.

