

BONDED CONCRETE OVERLAY CUMMINS - FORT McMURRAY, AB



PROJECT TEAM

OWNER

Cummins Sales and Services Inc.

GENERAL CONTRACTOR

Knelsen Sand & Gravel Ltd.

MAJOR SUB-CONTRACTOR

Proform Concrete Services

CONCRETE SUPPLIER

Knelsen Sand & Gravel Ltd.

CONCRETE CUTTING

McMurray Concrete Cutting & Coring Inc.

ENGINEERS

Beirsto & Associates Engineering Ltd.

Parkland Geotechnical Consulting Ltd.

THE OPPORTUNITY

Cummins was looking for a long-term solution to asphalt that failed after 4 years of operation in their new industrial facility in Fort McMurray. This facility endures constant heavy loading of massive engines on a large capacity forklift throughout the yard and required a pavement that could withstand the constant heavy loading.

THE SOLUTION

Bonded concrete overlay was the best solution utilizing a combination of flexible and rigid pavements and achieved the owner's budget, schedule and requirements. The durability of this option requires less maintenance and therefore less disruption of operations and delivers a 15 year lifecycle.

Because this facility requires a dust free environment, the selection of bonded concrete overlay was ideal because the asphalt gave an immediate solution sealing the surface and the concrete added the rigid component for a long term lifecycle.

ABOUT THE CEMENT ASSOCIATION OF CANADA (CAC)

The CAC is the voice of Canada's cement industry. A vital contributor to the country's economy and infrastructure, the industry provides a reliable, domestic supply of cement required to build our country's sustainable communities and is committed to the environmentally responsible manufacturing of cement and concrete products. Visit www.cement.ca for more information.

ABOUT CONCRETE ALBERTA

Concrete Alberta represents over 90% of the concrete producers in Alberta, and is fully funded by the membership of Producers, Associates and Affiliates. Concrete Alberta has been servicing the industry since 1962. Visit www.concretealberta.ca for more information.

PROJECT DETAILS

- This is the first time this construction technology has been applied in an industrial application in Alberta.
- Most bonded concrete overlays are applied over existing layers of asphalt but due to late seasonal timing, this project was designed using new asphalt.
- 2.4 kg/m³ of macro fiber was added to the mix design, increasing flexural strength from 4.2 MPa to consistently over 5 MPa.
- The subgrade was stabilized by using 30 kg/m² of cement application to a depth of 300 mm and then re-proof rolled to ensure no localized soft areas persisted.
- The granular layer was added over a woven geotextile fabric on the subgrade in one thick lift to minimize subgrade disturbance.
- To achieve maximum bonding, the asphalt was milled at 3-5mm, cleaned and kept saturated surface-dry (SSD) before placing the concrete.
- The primary runs were slipformed with a Gomaco GHP-2800 and the secondaries with a triple roller screed.
- The targeted slump for the slipform concrete was 20-40mm and roller screed finished concrete was 40-80mm.
- This project received the 2022 ACI Awards of Excellence in Concrete in the Advanced Concrete Construction category.



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