

Deck Replacement

Project type	Deck Replacement
Area	1,826m ²
Design	SPS 10-25-10
Date	July 2010
Location	Edmonton, Canada
Owner	City of Edmonton
Engineer	Dialog (Cohos Evamy)
Contractor	ConCreate

Summary

Using SPS Bridge Decks:

- 1,826m² installed over a short summer period in parallel with renovation of main trusses
- Saved 3 months off the entire project schedule
- Reinstated the full load capacity for this historic bridge without major structural reinforcement

Background

The Dawson Bridge is a 100 year old, 5 span truss bridge that forms an important link across the North Saskatchewan River running through the centre of Edmonton, Canada. The structure had weakened with age and a load limit had been imposed. The existing deck was a combination of concrete on wood. Replacing the deck with concrete and removing the load limit would have required a substantial strengthening of the truss superstructure. Any work would also be constrained by a short summer build period.

Details

Dialog (Cohos Evamy) investigated several deck alternates for the City. SPS Bridge Decks were selected as the alternative that offered the simplest, quickest installation that minimized truss strengthening and provided another 100 years life for the bridge deck.

The SPS Bridge Deck solution, designed with support from Intelligent Engineering, used simple SPS plates bolted down to the top flanges of existing transverses and new longitudinal stringers. Each 8m by 2m panel weighed 3.5 tonnes and was lifted into place using telehandlers working from panels installed only hours earlier. No in-field welding was required with plate continuity along the bridge being created by upper and lower bolted splice plates. The deck was sealed with a Stirling Lloyd Eliminator membrane prior to application of an asphalt wearing surface.

The SPS plates were manufactured in Cemilas' dedicated SPS manufacturing plant in the Netherlands and inspected by the City of Edmonton's engineers before being shipped to Canada. This valuable pre-installation quality control step



is not possible with concrete decks. The new stringers were fabricated by IE's local project partner, Empire Iron, who also detailed both the stringers and the panels in Tekla's 3D steel modelling package to ensure that all 15,000 bolt holes aligned on site - they did!

The speed and simplicity of the installation of the SPS panels allowed the deck to be replaced in one month rather than three and helped the lead contractor ConCreate to complete the whole project in one summer season.

“The SPS Bridge Deck allowed the entire project to be completed months faster and millions of dollars less expensively than a traditional concrete deck.”

Dialog (Cohos Evamy)

Product Specification

- **New decks**
- **Replacement decks**
- **In-situ strengthening**



SPS Bridge Decks

SPS Bridge Decks are prefabricated steel composite panels designed to provide an alternative to concrete and orthotropic decks. They are bolted directly to the top flanges of the supporting structure and are coated with an asphalt or polyurethane wearing surface. They eliminate the need for any concrete pours on site; minimise project delays; are 80% lighter than concrete decks; reduce the weight of the bridge superstructure and substantially reduce project schedules. Designers and planners can now get more out of highway budgets.

For new bridges, SPS Bridge Deck panels offer a new way of approaching bridge construction lightening structures, enabling more economic and shallower, longer spans and faster, less disruptive construction.

For existing bridges, using SPS Bridge Deck panels to replace degraded concrete decks reduces the dead load by up to 70%, allowing existing bridge structures to carry significantly greater live load without additional strengthening.

Furthermore, the simplicity and lightness of the panels enable the rapid replacement of concrete decks with minimal disruption to daily traffic and no reinforcement of the supporting structure.

For fatigued orthotropic steel decks, SPS Overlay can be used to create a stiff SPS deck without removing the original plates. The renewed stiffer deck improves the distribution of wheel loads across the troughs, decreases deck curvatures and increases the life of the bridge. Additionally, the reduced deck curvature increases wearing surface life.

Sandwich Plate System - SPS

SPS is a structural composite material made up of two metal plates bonded with a polyurethane elastomer core. SPS delivers high strength and stiffness making it an excellent alternative to both conventional stiffened steel and reinforced concrete.

SPS is now used in a wide variety of products including structural flooring, stadia and arena terraces, ships, offshore structures and bridges.