La Pólvora Highway, Chile

Thin Concrete Pavement (TCP)

BarChip Inc.
The Synthetic Fibre Experts

Project: Camino La Pólvora, Ruta 60-CH
Location: Valparaíso, Chile
Application: Heavy-duty concrete highway
Design Traffic: 189 million ESALs (Equivalent Single Axle Loads)
Pavement Thickness: 230 mm
Joint Spacing: Approx. 1.8 m
Design Life: 20 years
Completed: 2016

Camino La Pólvora forms part of Ruta 60-CH and is a critical freight route connecting Chile's highway network with the Port of Valparaíso. Heavy trucks account for around 80% of the road traffic, with approximately 2,500 trucks using the route every day and significantly higher numbers during peak periods.

After years of heavy loading and deterioration of the existing asphalt pavement, a major rehabilitation was undertaken in 2016. The project adopted a TCP concrete pavement reinforced with BarChip macro synthetic fibre, designed specifically for the exceptionally high traffic demands of the route.

Designed for extreme traffic

La Pólvora was designed for approximately 189 million ESALs, making pavement performance and durability critical.

BarChip macro synthetic fibre provides residual strength throughout the concrete, helping control bottom-up cracking and redistribute stresses within the pavement. Bottom-up transverse and longitudinal cracking can develop as fatigue cracks initiate at the underside of the slab and propagate upward. By controlling these cracks, BarChip increases slab capacity and fatigue life. Combined with the optimised TCP slab geometry, this improves overall pavement performance and allows significantly thinner pavement sections to be designed.

The solution allowed the pavement thickness to be reduced from more than 300 mm for a conventional concrete design to just 230 mm, reducing concrete usage by at least 23% and significantly lowering material consumption and associated embodied carbon.

Ten years of heavy-duty performance

Since completion in 2016, La Pólvora has carried thousands of heavy trucks every day serving one of Chile's most important ports.

Now, after 10 years in service with no reported issues, the project provides a powerful real-world demonstration of BarChip macro synthetic fibre reinforced concrete pavement under sustained heavy loading.

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