

Road Surface Rehabilitation

Service Station — Parsberg, Germany



Service station access road

BACKGROUND The access road between a major highway and a busy service station needed yearly repair due to heavy truck traffic.

The A3 autobahn in Germany is one of the most important routes in the country, extending from the Dutch border in the northwest to the Austrian border in the southeast. Its length and location make it a key thoroughfare for freight traffic crossing Europe, frequently traveled by heavy-goods vehicles (HGVs) weighing up to 40 tons or 80,000 lb. (40,000 kg) including cargo loads. Because of its convenient proximity to the A3, the Parsberg service station regularly receives heavy traffic along the way as well.

THE CHALLENGE The slope of the road, combined with the high daily number of heavy trucks turning on it, created immense shear loads.

The access road to the truck parking lot of the A3 Parsberg service station is located on a slope. It's subject to enormous loads because of the high daily number of trucks entering and decelerating on the access road and turning from there into the station parking lot. The shear forces acting on the asphalt structure are so great that the resulting pavement cracks along certain stretches had to be repaired annually, leading to unsustainable outlays of time, labor and money.

In 2011, the construction company in charge of maintenance consulted Simpson Strong-Tie's Bavarian sales partner, Nadler Strassentechnik GmbH, in search of a longer lasting, less costly solution for the client.

PROJECT INFORMATION

Project

A3 Parsberg Service Station
Parsberg, Germany

Project Category

Road Surface Rehabilitation, Reinforcement

Date

Summer of 2011

Simpson Strong-Tie Products

Carbophalt™ G pre-bituminized asphalt
pavement reinforcement grid

CHALLENGE

Find an asphalt reinforcement solution to resist heavy-vehicle shear forces and extend the (annual) repair cycle of a highly-trafficked access road to a service station truck parking lot.

SOLUTION

Apply Carbophalt G pavement reinforcement grids beneath a new, 1.5" (4 cm) wearing course to distribute shear stresses more evenly.

RESULTS

The first sign of wear in the reinforced section didn't show up until nine years after the rehabilitation.

THE SOLUTION Use glass- and carbon-fiber asphalt reinforcement grids to stiffen the road structure and help it better distribute and resist shear forces.

Working in close collaboration with the engineers at Simpson Strong-Tie, the designer came up with a rehabilitation concept that would meet the requirements of the client while holding the service station's closure times to a minimum.

The pavement rehabilitation design involved milling off the top 1.5" (4 cm) of the asphalt in the affected areas and replacing it with a new wear course. A polymer-modified asphalt was selected for this project. Simpson Strong-Tie Carbophalt™ G pavement reinforcement grids were placed between the milled substrate and the new wearing course. Subsequently, the surface was temporarily covered with a thick layer of crushed stone to protect the newly paved surface course for a few days until it had completely set and hardened before reopening it to traffic.

In this solution, the asphalt reinforcement performs two tasks. On the one hand, it increases the stiffness of the asphalt structure, distributing shear stresses over a larger area and anchoring them in the road body. On the other hand, it protects the new asphalt layer from reflective cracking or damage that could otherwise arise from the deeper asphalt layers.



Condition in 2017 — six years after installation



Condition in 2020 — nine years after installation



Condition in 2020 — first signs of deterioration after nine years; damage is not considered significant enough for the road to be repaired yet

THE RESULTS Reinforcement helped increase the asphalt structure's service life at least ninefold.

The solution using Carbophalt G reinforcement grids performed admirably despite the road grade and continuing traffic conditions. For more than six years after the resurfacing, no damage or cracking was observed on the repaired sections of the access road. In fact, it wasn't until 2020, nine years after installation, that the first signs of deterioration began to appear in the form of incipient top-down cracking — but these were not of an extent to call into question the serviceability of the repaired surface. Compared to the repair record of the pavement prior to the reinforcements, the service life had been increased at least ninefold with the help of Simpson Strong-Tie Carbophalt G asphalt pavement reinforcement grids.

**MORE
INFO**

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