

# Case study



A Simpson Strong-Tie® Company



## GRABISZYNSKA STREET



**Project name**  
Grabiszynska Street

**Location**  
Wrocław, Poland

**Objective / Initial position**  
Road surface reconstruction to change the road surface from paving blocks to a smooth asphalt surface

**Year**  
2003

**Duration**  
8 Years

### Project description

#### Description

Grabiszynska street is one of the key routes going into and out of the Southwestern City of Wrocław in Poland. Dealing with daily commuters, as well as changable conditions with cold winters and warm summers, the road gets exposed to a variety of factors which can easily cause damage to the road surface. Prior to a change in the road network structure in the City, the road was exposed to high traffic volumes with a significant share of heavy traffic, due to it being one of the main routes in and out of the City.

#### Situation

In 2003 the City decided to relay the road which was made up of historical 9 x 11 cm paving blocks. Laying a smooth asphalt structure over the top of paving blocks leads to many benefits for the road user including a more comfortable drive, as well as increased road safety.

However laying asphalt surfaces on top of paving blocks can quickly lead to problems

with cracking on the wearing course due to possible differential movements and bonding problems between the asphalt overlay and the paving block foundation. On top of that challenge, time was particularly critical with any planned renovation of the road, due to high traffic numbers of commuters on weekdays as well as the tramline running across it. Road closures needed to be limited and disruption had to be kept to a minimum.

#### Solution

Due to the existing height constraints (drainage, technical road infrastructure, etc.), the plan was to cover the paving blocks only with a 2.5 cm thick layer of high-strength SMA asphalt. In preparation for the works, only approx. 50 % of the surface was brought up to level with a leveling course. This was due to the fact that certain areas of the road had been severely damaged during flooding in 1997, whereas in certain areas the paving blocks remained in good condition. As a wearing course, a thin specially mixed wearing course, similar to SMA, of only 2.5 cm was

installed on top. The solution was considered a 'risk', due to the thinness of the wearing course layer, and the construction company only offered a guarantee of 6 months service for the life of the road following the installation.

On S&P's recommendation, the road owner decided to reinforce the braking and stopping zones in front of the traffic lights with S&P Carbophalt® G. The S&P asphalt reinforcement grids were installed in these specific locations in order to counteract the shear forces and point loads introduced into the thin asphalt layer by decelerating, stopping and accelerating traffic. The high-tensile carbon fibres in S&P Carbophalt® G are particularly suitable for this purpose, as they are capable of absorbing considerable forces even at the lowest elongations (>1.5 %) and anchoring them in the bond with the surrounding asphalt.

# Case study



A Simpson Strong-Tie® Company

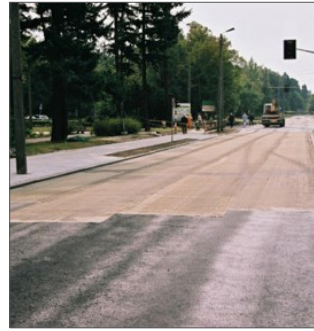
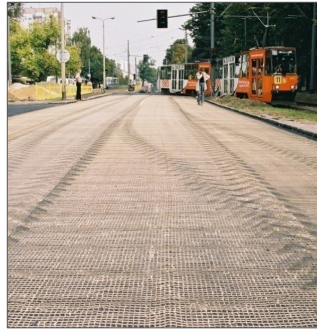


## GRABISZYNSKA STREET

### Project tracking

In the following years, S&P continued to monitor the condition of the road. The focus here was not only on the areas where S&P Carbophalt® G had been installed, but also on the areas where there was no S&P asphalt reinforcement grid present. During the project tracking it was clear to see that the areas with S&P asphalt reinforcement grid performed admirably and the road remained in good condition, however the areas where no reinforcement grid is present quickly suffered from excessive cracking and damage. The pictures below illustrate and back-up how the S&P grid performed compared to road sections where no grid was present:

#### September 2003 - S&P asphalt reinforcement grid installation



The City of Wroclaw decided to re-pave the previously cobbled road to ensure a more comfortable drive for road users.

#### February 2006 - Inspection after 2.5 years



Substantial cracking could already be seen on areas of the road where no S&P asphalt reinforcement grids were installed.

#### April 2008 - Inspection after 4.5 years



In the areas where S&P asphalt reinforcement grids were installed, no damage was observed - complete contrast to sections of road with no grid.

# Case study



A Simpson Strong-Tie® Company



## GRABISZYNSKA STREET

### November 2009 - Inspection after 6 years



Even after 6 years, the road sections where S&P asphalt reinforcement grids were installed remained in great condition.

### November 2011- Inspection after 8 years



Finally after 8 years, the first signs of damage began to appear and the thinness of the asphalt layer on top is clearly visible.

## Summary

The surfaces reinforced with the S&P asphalt reinforcements achieved a service life that exceeded that of the unreinforced surfaces by at least three times and this despite the increased loads and requirements in the intersection areas. It was not until 2011, 8 years after construction, that the first damage to the reinforced areas became visible. If this is compared to the 6 months that the contractor had predicted as the lifetime of the unreinforced surfaces, the performance of S&P Carbophalt® G in this application becomes more than apparent.

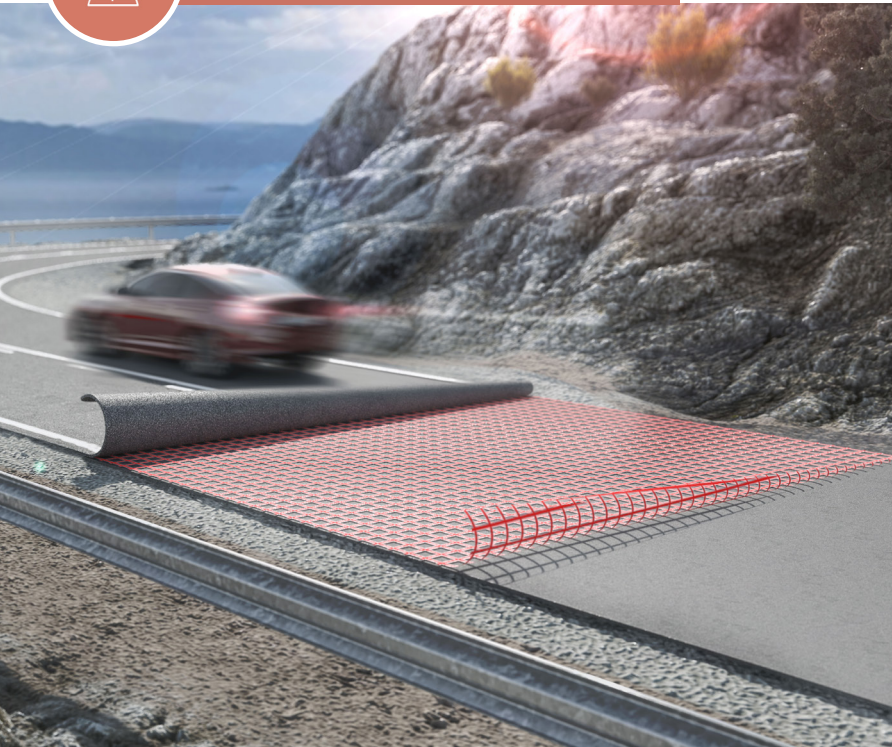
# Case study



A Simpson Strong-Tie® Company



## GRABISZYNSKA STREET



### Client benefits

- Durable and long term solution
- Cost saving
- Resource saving
- Greatly reduced traffic obstructions

### Product used

- S&P Carbophalt® G

### Contact

S&P Polska Sp. z o.o.  
Ul. Bydgoska 9  
PL- 82-200 Malbork  
Poland  
+48 55 646 97 00  
info@sp-polska.pl

