

Prolonging the life of Charles



Charles Bridge, the 650-year-old iconic structure in the heart of Prague, has been undergoing a major renovation – repairing damage caused by the weather, wear from many thousands of tourists and the floods of 2002.

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Originally forming the only route across the River Vltava, Charles Bridge has played an important role in the growth of the city. Today it plays a major part in the city's tourism industry with the gothic structure being an attraction in its own right as well as connecting the Lesser Quarter (Mala Strana) and the Old Town (Staromestka). The bridge has also provided the backdrop for numerous films, music videos and even computer games.

In the 14th Century the construction team used what were then innovative methods and materials, aiming to increase the life of the bridge; particularly famous is the legend that egg yolks were used in the original mortar to give it extra strength.

The current €8.7 million (US\$12.9m) refurbishment includes repairs to the upper bridge section, replacement of the old concrete deck, installation of a new

waterproofing system, replacing stones in sills where required, new drainage and repair to the structure's piers. Like their predecessors the engineers on the project were keen to use long-lasting solutions for this work, one of which was Stirling Lloyd's Eliminator waterproofing system, which will replace the existing leaking system. The system was chosen to protect this historic structure by the project engineer, Mott MacDonald and the client, Prague Municipality.

Selection criteria

Essential to the success of the refurbishment was the chosen waterproofing solution's ability to achieve a strong bond to the deck of the bridge. Consequently, a minimum bond strength of 1.6MPa to both the new concrete deck and the existing Bohemian sandstone of the main structure was required. Of the five systems being considered, the Eliminator

waterproofing membrane achieved the highest adhesion results after laboratory UV and freeze cycling tests had been carried out, averaging over 2MPa.

The Eliminator system would also provide a tough, durable membrane that would be tolerant of site conditions, while offering an extended service life. Being based on advanced methyl-methacrylate (MMA) technology enabled the system to be applied in a range of temperatures and climatic conditions, which meant that installation of the waterproofing could be carried out throughout the year, a feature which the competing systems were unable to offer.

For such an important tourist attraction it was imperative that any disruption to the use of the bridge and any visual impact were kept to an absolute minimum. Consequently, the programme allowed for work to be carried out to just one 150m² area at any one time.