



Netherlands

ZEELAND BRIDGE

A LONG BRIDGE SUSPENDED OVER THE SEA REQUIRING CONSTANT, METHODICAL MAINTENANCE USING CUTTING-EDGE PRODUCTS

In 1962 the Province of Zeeland – an area in the south-western part of the Netherlands – decided to build a quick connection between the isles Noord-Beverland and Schouwen-Duiveland with the industrial area around the city Vlissingen-Oost, which was then going through a period of strong development. At the time, work on the Delta Plan project – a series of construction projects consisting of dams and infrastructures which have been protecting coastal areas from flooding since 1953 – was still in full swing. The Province of Zeeland, however, decided not to wait for the Oosterschelde dam to be built, which was to include a new road connecting various local towns, and went ahead on their own. The dam was completed in 1987, whereas

the Zeeland Bridge had already been in service for more than twenty years: construction work on the bridge started in 1962 and it was inaugurated by Queen Juliana of the Netherlands on the 15th of December, 1965.

In order to recover the cost of the work, which had not received any form of state funding, from the inauguration date until the 31st of December 1992 anybody using the bridge, including pedestrians, cyclists and bus passengers, were required to pay a toll. In 2000 the road received a major overhaul to make it safer and bring it in line with the latest highway regulations and work included replacing the old guardrails on both sides of the road with concrete barriers and the introduction of a by-law that prohibited overtaking. On the 15th of December, 2015, the Zeeland Bridge was declared a Monument of National Interest by the Netherlands National Cultural Heritage Agency.

A STRUCTURE SUSPENDED OVER THE SEA

The Zeeland Bridge is an imposing, 5,002-m-long structure and, up until the inauguration of Öland Bridge in Sweden (6,072 metres long), it was the longest bridge in Europe. It is made up of 54 pillars and 52 spans of 95 m and has a mobile section 40 m long. The Zeeland Bridge, which has two lanes and a cycle lane, is suspended over the water and its entire length is supported by pillars in the form of an upside-down “V” placed on reinforced concrete bases which, in turn, sit on the seabed. The bases are of different lengths. Where the water is particularly deep they are 60 m long, while in other areas they are up to 30 m long. The bridge also has many different parts that are connected together by strong steel cables for a total length of 300 km.

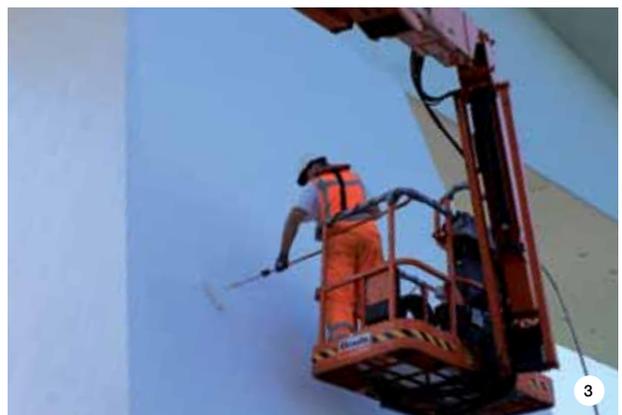
The bridge is exposed all day and all night to the effects of the sun, winds and, above all, the sea, as well as carbon dioxide emissions from passing vehicles, which means it needs to be constantly and methodically checked and maintained. New coloured coating is applied to the pillars every 10 years and the products used are evaluated to check their adhesion proper-





> **5,002**
Length (in m)
of the bridge

> **300**
Total length (in km)
of the steel cables
(if joined together)



PHOTOS 1 AND 2. The intervention also included a corrosion-inhibiting treatment using MAPEFER 1K on reinforcing rods and concrete repair with PLANITOP SMOOTH & REPAIR R4.

PHOTO 3. Application of two coats of ELASTOCOLOR WATERPROOF paint.

ties when applied to the substrate, their durability, the stability of their colour and their resistance to atmospheric agents. In 2016 the owners of the bridge tested a number of products from different manufacturers on the surface of some of the pillars, including products proposed by Mapei. After 6 months the product that had demonstrated the best performance characteristics in terms of adhesion, flexibility, resistance and colour maintenance was ELASTOCOLOR WATERPROOF acrylic paint for permanent contact with water, which is easy to clean and resistant to all types of atmospheric phenomena and smog.

Before proceeding with painting the pillars, the concrete on some of the pillars was found to be badly deteriorated. Mapei Technical Services recommended removing the deteriorated areas until the reinforcing rods were exposed. It was recommended to apply two coats of MAPEFER 1K one-component, protective mortar on the reinforcing rods.

Once MAPEFER 1K had dried, the surface of the pillars was repaired with PLANITOP SMOOTH & REPAIR R4 structural, rapid-setting, shrinkage-compensated, thixotropic, fibre-reinforced mortar. The pillars were then finished off by applying two coats of ELASTOCOLOR WATERPROOF.

IN THE SPOTLIGHT ELASTOCOLOR WATERPROOF

It is a flexible, protective paint for outdoor applications made from acrylic resin in water dispersion.

ELASTOCOLOR WATERPROOF may be used as the final finishing coat wherever a highly water resistant paint is required.

It offers excellent resistance to all types of climatic conditions, aggression from smog and sunlight and forms a hard-wearing, protective layer on substrates which resists the rigors of time. It ensures it a highly attractive, smooth finish.



TECHNICAL DATA

Zeeland Bridge, Province of Zeeland (Netherlands)

Period of construction: 1962-1965

Period of the intervention: 2017-2018

Intervention by Mapei: supply of products to protect the reinforcing rods, repair concrete and protect and paint the pillars

Design: Rijkswaterstaat

Client: Province of Zeeland

Works director: Joost Sluiter

Main contractor: Gebr. Van Kessel Speciale Technieken en Producten B.V.

Photo: A.o. Erik Hendriks

Mapei coordinators: Erik Hendriks (Mapei Netherlands B.V.) and Gino Kuijpers (Mapei SpA, Italy)

MAPEI PRODUCTS

Concrete repair: Mapefer 1K, Planitop Smooth&Repair R4

Decorative and protective coating: Elastocolor Waterproof

For further information on these products visit www.mapei.com and www.mapei.nl