SIKA AT WORK
Deep Sea World, Scotland

Products: Sika Watertight Concrete, Sika WT-200 P Admixture

BUILDING TRUST

SIKA AND BREEDON SEAL SUCCESS AT DEEP SEA WORLD

Completed seal tank

During

During

PROJECT DESCRIPTION

Deep Sea World is a popular aquarium located in the village of North Queensferry in Fife, Scotland. The attraction sees 100,000 tourists visit annually and boasts a wide range of different marine life and one of the world's longest underwater tunnels. Breedon concrete containing Sika products was used to replace the existing concrete base of Deep Sea World's seal tank. The work involved removing and replacing the existing concrete base in order to provide a robust solution for years to come.

Work was carried out by Graham Irvine & Partners, Kirkton Farm and Peebles (on behalf of GKM Property Management) with Breedon supplying the concrete.

PROJECT REQUIREMENT

The aim of the Deep Sea World project was ultimately to stop the egress of water in accordance with BS8102:2022 for the seal tank. This meant one specific challenge at the location was the slope in which a portion of the concrete needed to be poured. Sloped surfaces require a specific type of concrete, typically low-slump, which has a higher proportion of cement to water. Furthermore, the concrete pour needed to be done slowly and carefully to prevent sliding or uneven setting.

PROJECT SOLUTIONS

Sika and Breedon's technical teams worked together, alongside the customer, to design and deliver the right concrete mix for the Deep Sea World project. Across a two-day period, 83m3 of Breedon Aquatight (C28/35) concrete mix with the Sika WT-200 P additive was supplied, with Breedon and Sika's teams overseeing the concrete pour. The concrete mix included GGBS and was supplied on a CIIIA cement type, making it a low carbon product with improved durability.

Although the customer needed 35N/mm3 strength, on testing, the concrete actually produced 50N/mm3, providing an even more durable solution. Sika® WT-200 P was chosen as it is a combined water resisting and crystalline waterproofing admixture used to reduce the permeability of concrete and to enhance its self-healing abilities. A mixture of active materials form non-soluble products throughout the pore and capillary structure of the concrete and seal it permanently against the ingress of water and other liquids. Breedon Aquatight Concrete and Sika® WT-200 P are both suitable for various watertight structures, including swimming pools and water-retaining structures. Together their features meant that they could offer benefits valuable to the Deep Sea World project team, such as reduced water penetration under pressure and reduced water absorption. Pumpmix was used for the seal tank base and a 60-70mm slump for the slope to provide a watertight solution for the 2.5 metre seal tank. It was important that the teams used a lower workability concrete, meaning that the specification for workability was tighter and that great care was taken to produce the material to this tight spec.

Steven Irvine, from Graham Irvine & Partners, said: *"In terms of ease of use and deviation from the usual concrete products we use on a daily basis; we found the concrete with Sika additive no different when laying, and wouldn't hesitate to use in the future for similar purposes."*

PROJECT PARTICIPANTS

Owner: Deep Sea World
Contractor: Renderseal Ltd
Concrete Supplier: Breedon