SIKA AT WORK
REFURBISHMENT OF THE GABČÍKOVO LOCKS ON THE RIVER DANUBE IN SLOVAKIA

CONCRETE REPAIR AND PROTECTION USING: Sika® Abraroc®-SR, Sika MonoTop®-910, Sikadur® Combiflex® SG -20 M, Sikadur®-31 CF Rapid, Sikagard®-675W Elastocolor, SikaGrout®-311, Sika MonoTop®-412 N, Sika® Injection®-201

BUILDING TRUST

REFURBISHMENT OF SHIPPING LOCKS BIGGER THAN ON THE PANAMA CANAL

THE GABČÍKOVO WATERWORKS WAS originally designed and built on the Danube close to Bratislava, the capital of Slovakia, and close to the borders with Austria and Hungary. The main purpose of the huge water work project was to protect the region against flooding from the Danube. The reservoir and massive locks which are bigger than those on the Panama Canal also provide year-round navigation to the Black Sea. The hydroelectric power station at the dam provides approximately 8% of the whole country's annual elect ricity consumption.

The Waterworks consist of a 16 km long Hrušov reservoir designed to hold accumulating river water and control the flow through channels into the hydro-electric power station's turbine generators, before discharging back into the river further downriver. The huge 32 meter high lock system was built to overcome the major differences in water levels (up to 22 metres) and control the release of potential flood water. When ships enter the lock chambers, they drain from the base. In 15 minutes there is a change of around 200,000 m^3 of water.

Each lock chamber is 275m long and 34m wide - larger than those on the Panama Canal. After more than 20 years' service there was significant visible damage to the reinforced concrete structure. During this time there had been no major maintenance or repair works carried out. In 2013 it was decided by the Project Engineer to carry out major refurbishment firstly focussing on the left lock chamber, including the overflow edges, inlet and outlet channels.

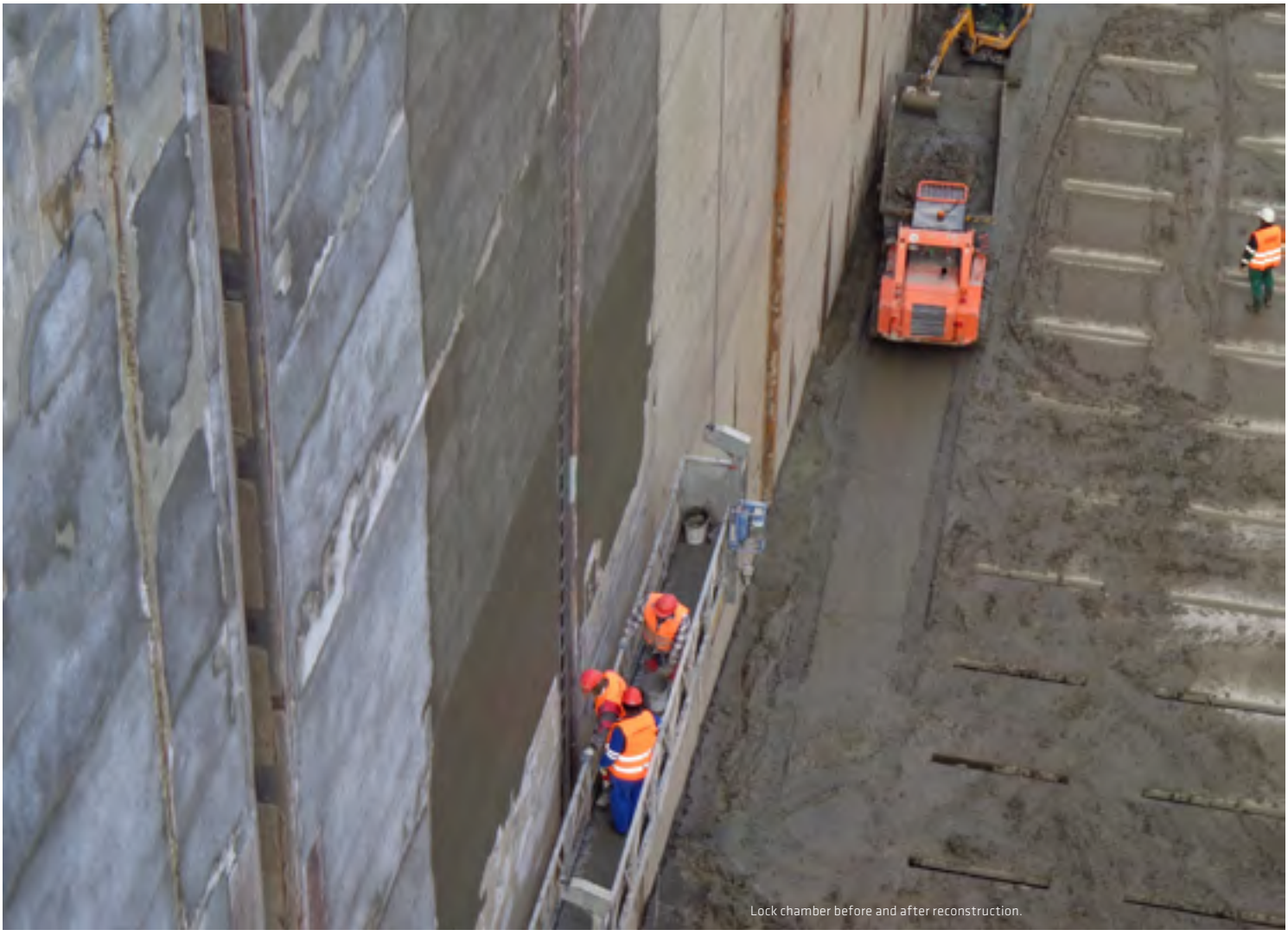
REFURBISHMENT OF LEFT LOCK CHAMBER

SIKA SOLUTIONS

The whole of the lock chamber had to be drained and thoroughly cleaned using high water pressure jetting. The surfaces of the reinforced concrete structure were repaired using a special type of mortar - Sika® Abraroc® SRSika® Abraroc® SR has following characteristics:

- Class R4 in accordance with EN 1504-3
- Compressive strength after 24 hours – min. 25 MPa
- Compressive strength after 7 days – min. 60 MPa
- Compressive strength after 28 days – min. 80 MPa
- Class of wear resistance by Böhm - A6

Sika® Abraroc® SR is ideal for the repair and protection of load-bearing, reinforced concrete hydraulic structures against hydraulic abrasion and aggressive water (pH>4), such as those in water and waste water treatment plants, dams, cocks and harbours, plus many other civil engineering structures that are subjected to heavy abrasion and loads such as the floors in storage and loading bays, silos and other industrial facilities.



Lock chamber before and after reconstruction.

SEALING OF OVERHEAD CRACKS IN THE INLET AND OUTLET CHANNELS

The exposed areas of the repaired lock walls were coated with Sikagard®-675 N Elastocolor in RAL 7030 to further protect the surface and provide an uniform color.

The structural movement / expansion joints in the concrete lock structure were repaired and sealed with Sikadur® Combiflex® SG-20 M 200 system to accommodate high movement and additionally due to the ease of this product's installation. This system consists of 200mm Combiflex strips, 2 mm thick, bedded and bonded onto the prepared concrete on both sides of the joints using the Sikadur®-31 CF Rapid; a high performance, 2-component, epoxy resin based adhesive. The free central 'movement' zone of the strip is not covered with adhesive or bonded to the surface and can accommodate high movement in any direction.

Sika materials:
- Sika MonoTop®-910
- Sika® Abraroc® SR
- Sikadur® Combiflex® SG 20 M 200
- Sikadur®-31 CF Rapid
- Specialist Contractor: Izolex Bau s.r.o., Košice

Cracks in the concrete soffit of the water inlet and outlet channels had formed for different reason over time. The Project Engineer decided these needed to be effectively sealed to restore the structural integrity and prevent further water ingress to the structure. The system selected for filling and sealing the cracks was Sika® Injection®-201, a 2-component, flexible, polyurethane resin based injection system.

Sika materials:
- Sika® Injection®-201
- Packers

Specialist Contractor: Izolex Bau s.r.o., Košice

REPAIR OF THE CONCRETE OVERFLOW EDGES

The water overflow edges are subjected to severe expose, stress and loading. The surface was given additional protection with heavy steel plates fixed to the repaired concrete surface using Sika MonoTop®-412 N; a 1-component, polymer modified, cement based concrete repair mortar complying with the requirements of EN 1504-3. The small void between the steel plates and repair concrete surface was sealed using an injection pump using SikaGrout®-311; a high early and final strength, cementitious precision grout.

Sika materials:
- Sika MonoTop®-412 N
- SikaGrout® -311 Specialist

Contractor:
MBL , s.r.o., Košice

REFURBISHMENT OF THE GABČÍKOVO LOCKS, SLOVAKIA

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.

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