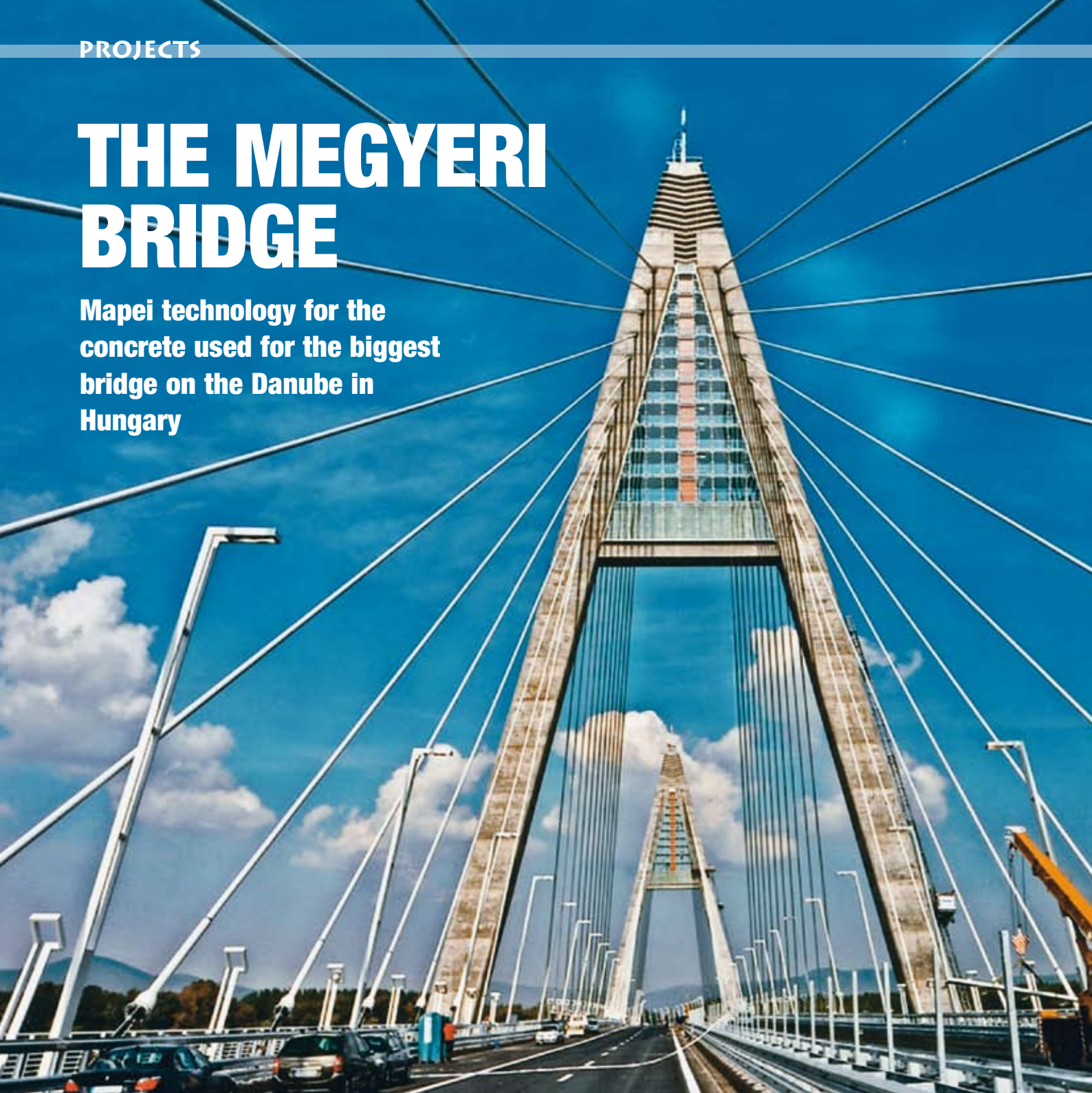


THE MEGYERI BRIDGE

Mapei technology for the concrete used for the biggest bridge on the Danube in Hungary



A bridge which, to be more precise, joins 5 single bridges, and which now has a different name from when it was originally constructed.

The story of the Megyeri Bridge over the Danube, previously called the North Bridge and along which runs the M0 Budapest ring-road, is an unusual one. This bridge is heavily used by traffic, and crosses the Danube between Buda and Pest, the western and eastern areas respectively of the Hungarian capital.

The bridge, suspended on cables anchored to two pillars in reinforced concrete, was officially opened to traf-



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fic at the end of September 2008. And back in 2006, the Hungarian Ministry for Transport promoted an on-line poll to collect ideas for the name of the new road bridge, and the name chosen was Megyeri hid, or “Megyeri Bridge”.

The largest bridge over the Hungarian stretch of the Danube is 1,862 metres long and includes 5 separate bridges: a 600 metre-long steel bridge built using diagonal cables; a second steel bridge 332 metres long, which crosses the Danube from the Island of Szentendre (or Saint Andrew) in the middle of the river; the third bridge is 560 metres long and runs above the flood plain of the island, joining a further two reinforced concrete bridges on the right bank and left bank of the river (each one approximately 200 metres long).

Technology Used to Construct the Concrete Pillars

One of the biggest challenges when constructing the bridge on the busy M0 ring-road was to build the main structure of the bridge over the wide branch of the river. The 600 metre-long steel structure is suspended by diagonal cables anchored to 100 metre-high reinforced concrete pylons. The mix of reinforced concrete used to construct the bridge was designed and tested by two plants of Holcim and two plants of TBG local ready-mix concrete companies.

At the start of the work, admixtures manufactured by one of Mapei’s competitors were used.

However, over time and with the onset of winter, the concrete was not solidifying quickly enough to meet the tight construction schedule of the concrete incremental bridges. The problem was solved by using Mapei’s DYNAMON SR3 superplasticizer based on modified

acrylic polymer for ready-mixed concrete, characterised by its low water/cement ratio, extremely high mechanical strength and long slump retention. DYNAMON SR3 was also used at a later date for the pylon for the stay bridge and for the joists of the incremental bridges. Repairs to the concrete were carried out using MAPEFER 1K one-component, corrosion-inhibiting cementitious mortar, used to protect reinforcing rods and promote bonding of mortar for repairing concrete, and MAPEGROUT THIXOTROPIC fibre-reinforced, shrinkage-compensated mortar for repairing concrete. MAPEFINISH two-component cementitious mortar was then used to smooth the concrete surfaces.

High Quality Also for the Smaller Bridges

On top of the reinforced concrete structure of the incremental bridges – for the painted surfaces, and especially on the sides and bottom of the joists of the incremental bridges - ELASTOCOLOR PRIMER solvent-based, fixing primer with high-penetration properties for porous substrates and ELASTOCOLOR PAINT flexible, decora-

Photo 1.

The spectacular reinforced concrete antenna and junction stays on the main arm of the Megyeri Bridge over the Danube.

Photos 2 and 3.

DYNAMON SR3 admixture was used for the joists of the incremental bridges.

Photo 4.

MAPECOAT BS1 was used to protect and waterproof the junction bridges.




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tive acrylic resin-based paint in water dispersion for concrete were applied, for high resistance against corrosion and aggressive atmospheric agents.

The following products were applied on the smaller junction bridges: MAPELASTIC BV3 two-component flexible mortar for protecting and waterproofing concrete surfaces (a product specially developed for the Hungarian market, with similar characteristics to MAPELASTIC); MAPEFLOOR H 02 two-component, multi-purpose epoxy resin (developed for the Hungarian market, similar to PRIMER SN without fillers) and MAPECOAT BS 1 two-component, flexible, epoxy-polyurethane resin-based dressing material resistant to abrasion, used to protect and waterproof concrete.

Very high quality standards were required for the concrete, and amongst all the companies which tendered for the job, the mixes designed by Holcim using the Mapei superplasticizer, DYNAMON SR3 were those chosen, and precisely because they met the required quality standards. Mapei, therefore, is quite rightly proud to have been involved in this important project in Hungary, in an area which is vitally important for the European road transport network. 



DYNAMON SR3

DYNAMON SR3 is an admixture based on a modified acrylic polymer designed specifically for the ready mix concrete industry, belonging to the revolutionary Mapei DYNAMON SR system. The DYNAMON SR3 system is based on DPP (Designed Performance Polymer) technology. Concretes manufactured with DYNAMON SR3 have a high level of workability (consistency class **S4** or **S5**, according to **EN 206-1**), and are consequently easy to apply when fresh. At the same time they offer excellent mechanical performances when hardened. DYNAMON SR3 is particularly suitable for ready mix concrete and wherever there is the need for a strong water reduction, along with relatively high mechanical strengths at early age with different consistency classes and with long slump retention. This product has been awarded the **CE mark** in compliance with **EN 934-2** standard.



Mapei Products: the products mentioned in this article belong to the "Building Speciality Line" and "Admixtures for Concrete" ranges. The technical data sheets are available at the web site: www.mapei.com. Mapei plasticizers and superplasticizers for mortars and concrete have been awarded the CE mark in compliance with EN 934-2 and 934-4 standards. Mapei products and systems for maintenance of buildings and for the repair of concrete have been awarded the CE mark in compliance with EN 1504 standards.

Dynamon SR3 (CE EN 934-2, coating (c), principles PI, MC and IR): superplasticiser based on modified acrylic polymer for concrete with low water/cement ratio, high mechanical strengths and long slump retention.

Elastocolor Paint (CE EN 1504-2): protective and decorative elastic paint for concrete and renders based on acrylic resins in water dispersion.

Elastocolor Primer: solvent-based fixing primer with high penetration properties for porous substrates and curing agent for repair mortars.

Mapecoat BS 1: two-component, flexible,

abrasion-resistant, epoxy-polyurethane resin-based dressing material for protecting and waterproofing concrete structures.

Mapefer 1K (CE EN 1504-7): one component corrosion-inhibiting cementitious mortar for the protection of reinforcing rods.

Mapelastic BV3: two component, flexible cementitious mortar for protecting and waterproofing concrete surfaces, balconies, terraces, bathrooms and swimming pools. N.B. This product has been specially developed for the Hungarian market where it is distributed by Mapei Kft., the local subsidiary of the Mapei Group.

Mapefinish (CE EN 1504-2, coating (c) principles PI, MC and IR; EN 1504-3 class R2): two-component cementitious mortar for finishing concrete surfaces.

Mapefloor H 02: multi-purpose, two-component epoxy resin.

N.B. This product has been specially developed for the Hungarian market where it is distributed by Mapei Kft., the local subsidiary of the Mapei Group.

Mapegrout Thixotropic (CE EN 1504-3, class R4): shrinkage-compensated fibre-reinforced thixotropic mortar for the repair of concrete.

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Photo 5. The Megyeri Bridge on the M0 Budapest ring-road is a complex structure which connects 5 different bridges into a single bridge. This photo illustrates the bridge which crosses the wide branch of the river, with a connection to one of the smaller bridges in the background.

Photo 6. A panoramic view of the main arm of the Megyeri Bridge which crosses the Danube.

TECHNICAL DATA

Megyeri Bridge on the M0, Szentendre-Szigetmonostor, Budapest (Hungary)

Designer: Unitef-Céh Kkt.

Period of Construction: 2006-2008

Intervention by Mapei: supplying products for building several elements of the reinforced concrete structure and for protecting the incremental and junction bridges

Client: Nemzeti Infrastruktúra Fejlesztő Zrt.

Works Director: Laszlo Windisch, Hidépítő Zrt.

Contractors: Hidépítő Zrt. and Strabag

Mapei Co-ordinator: Szautner Csaba, Mapei Kft (Hungary)