

The A4 freeway construction

WIERZCHOSŁAWICE - KRZYŻ - POLAND

KEY FACTS

- 13 bridges of A4 highway
- 4000 m of granite curbs installed with MAPEGROUT 430 / MAPEFLEX PU40 & MAPEFLEX PU45
- More than 30 000 m² of the bridges' surface protected with ELASTOCOLOR PITTURA and COLORITE PERFORMANCE



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Let's present the project...

The history of A4 freeway which connects the east and west borders of Poland dates back to 1936 when the stretches of a German road called Reichsautobahn were put into operation. This road was located in the area of Lower and Upper Silesia which were both part of the German territory in this period. The sections, of the total length amounting to 103,3 km, were divided in the following way: Krzywe - Legnica, Legnica - Wrocław and Gliwice - Bytom. Until 1945 works were also carried on other sections which, however, were never completed. The remains of ground works along with flyovers were present in this zone until 2007, that is until the moment when on a marked route, a modern freeway was going to be built. The A4 highway, round 670 km long, is due to become the longest road in the country. It is situated in the south of Poland and constitutes a part of an international E40 route. It is also a continuation of a German road from the Drezno side, through the former border crossing in Jędrzychowice near Zgorzelec, through



Legnica and Wrocław, through Katowice and Kraków and further through Tarnów and Rzeszów. The road goes up to border crossing to Ukraine in Korczowa which, at the same time, is the east boundary of European Union.

...and MAPEI contribution

MAPEI was involved in the works on the A4 highway section: Wierzchosławice - Krzyż in the vicinity of Tarnów. The cooperation with the constructors commenced in autumn of 2010, right from establishing the solutions to create a protective barrier for underground parts of the highway's bridge. This structure is one of the longest freeway bridges in Poland (object MA-78). This task was the only mission to accomplish for MAPEI building line specialty products. The reinforced concrete protection of the bridge's underground parts occurred to be a perfect assignment for this line's solutions. This structure's supports were poured 20 m deep into the ground (anchored stilts) and a dozen meters or so above the ground level. Despite of the fact that they were made from waterproof concrete, a proper protection from ground water was necessarily required. An all-purpose bituminous, waterproofing emulsion, PLASTIMUL for horizontal and vertical surfaces and for concrete protection against humic acids was efficiently used. It protects underground building parts, foundation walls, bridgeheads and supports, flyovers, viaducts and retaining walls. Easy and convenient application of the emulsion sped up much the ground works on large areas. Another problem consisted in fastening and anchoring the granite curbs on bridges. The documentation revealed that a low-shrinkage cementitious mortar MAPEGROUT 430 is necessary. Each curb had 14 mm wide and 8 cm deep holes drilled. In the mentioned openings, 50 cm long metal rods were pasted in with ADESILEX PG 1. The upper endings of the rods were installed in the molding beams, whereas the curbs were anchored with MAPEGROUT 430. The described method served for a 4 km-long edge. The connections of the curbs were effectively and durably sealed with the use of a one-component polyurethane sealant MAPEFLEX PU40 or MAPEFLEX PU45. The following task consisted in preparing the bridge parts above the ground by protecting them against: CO₂ (carbonization), de-icing salts (chlorides), acid rains (SO₄) and weather conditions (UV rays, freezing weather). While pouring the concrete on the building site it's possible to encounter different unfavorable conditions which may result in minor aesthetic imperfections of the concrete surface. Here, a solution appeared to fill all cavities with the use of MONOFINISH repair mortar modified with PLANICRETE resin which resulted in high absorbency, even to smooth surfaces. Larger cavities were primarily repaired with MAPEGROUT 430 and, in areas where a really quick repair was necessary, with PLANITOP 400 mortar. Such prepared concrete substrates could handle protective coatings application. Accordingly to the designed scheme pattern, concrete protective paints were applied. On prestressed structures (bridge spans) COLORITE PERFORMANCE was applied, whereas on supports, a flexible paint was used - ELASTOCOLOR PITTURA. During such a vast investment it was just impossible to avoid emergencies which imposed looking for rapid and proven solutions. Unforeseen cracks in the reinforced concrete were repaired with EPOJET LV, while bridge abutment dilatations with expansion tape pasted in with ADESILEX PG4. Small cracks were filled with EPORIP which was ulteriorly used as bridging layer. The works on this 17 km-long section were performed according to schedule (that is from autumn of 2010 until the end of August 2012). MAPEI solutions, in total, resulted much helpful in 13 structures of A4 freeway on the Wierzchosławice - Krzyż section.

MAPEI PRODUCTS: COLORITE PERFORMANCE, ELASTOCOLOR PITTURA, MAPEFLEX PU40, MAPEFLEX PU45, MAPEFLEX PU65, MAPEFLOOR I 914, MAPEGROUT 430, MONOFINISH + PLANICRETE, PLASTIMUL.





TECHNICAL DATA

- Name of building intervention: A4 freeway / Wierchoslawice - Krzyż / Poland
- Type: TRANSPORT (ROAD)
- Period of construction: 2010-2012
- Period of MAPEI intervention: 2010-2012
- Intervention by MAPEI: protection waterproofing and finishing off 13 freeway's structures
- Customer: SYSTEM s.c.
- General contractor: DRAGADOS
- Laying company: ARMA
- Site manager: Karol Malinowski
- MAPEI Coordinator: Mariusz Orzet

MAPEI PRODUCTS	MATERIAL INSTALLED	SUBSTRATE	QUANTITY OF PRODUCT	SURFACE	INSIDE/ OUTSIDE	NEW/ RENOVATION	PRODUCT LINE
	DO NOT COMPLETE FOR BUILDING PRODUCTS						
PLASTIMUL			4 110 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MAPEGROUT 430			134 150 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MONOFINISH + PLANICRETE			11 525 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
ELASTOCOLOR PITTURA			8 000 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
COLORITE PERFORMANCE			10 680 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MAPEFLEX PU40			520 pcs		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MAPEFLEX PU45			2500 pcs		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MAPEFLEX PU65			160 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING
MAPEFLOOR I 914			196 kg		OUTSIDE	NEW	PRODUCTS FOR BUILDING



