SIKA AT WORK
MODERNIZATION OF THE ROAD -TRAM CROSSING ALONG TELIMENY STREET, KRAKOW

SIKA TECHNOLOGIES: RAILFIXING: SIKA® ICOSIT® KC SYSTEM, GROUTING MORTAR SIKAGROUT®-4 R

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MODERNIZATION OF THE ROAD -TRAM CROSSING ALONG TELIMENY STREET, KRAKOW

DESCRIPTION
The replacement of the road-tram crossing along Telimeny Street in Krakow located at the intersection of Telimeny, Cwiklinska and Aleksandry Streets was part of the implementation of large-size CONTRACK slabs in the renovation of communication infrastructure in large cities. Due to the course of the tram line in the arch, in the reconstruction of the passage using standard prefabricated concrete slabs, it would be necessary to lay 25 panels. The use of the CONTRACK technology allowed to reduce the number of plates to 4.
The CONTRACK technology increases durability and improves surface quality, at the same time allows to accelerate construction and reduces to a minimum the time needed for maintenance work related to critical road crossings and elements of tram tracks. It is supposed to relieve residents, drivers and city authorities of the need for long-term use of substitute communication and the organization of detours of the busiest streets – the construction, replacement and repair of key infrastructure elements is to take up to 72 hours (so-called weekend works).
Source: Transport Publiczny

PROJECT REQUIREMENTS
The renovation works carried out in large cities, in dense urban areas, require special attention at the planning and design stage to ensure that disruptions to both tram and road traffic are as limited and short as possible, and that their impact on the surroundings is as minimal as possible.
An important element of the work was to test alternative logistics and technological solutions in the conditions of limited space and under an active traction network.
The scope of the project included demolition of existing structure, preparation of the subgrade, setting of prefabricated slabs in the plan and profile, grouting with early, high strength mortar, priming, assembly and welding of rails and turnouts, application of elastic polyurethane materials for fixing rails and filling joints between the slabs, as well as performing any additional works related to the reconstruction.

SIKA SOLUTIONS
The maximum acceleration of work and reduction of traffic disruptions during the replacement of road-tram crossing in cities is possible thanks to the innovative technology of prefabricated turnout slabs CONTRACK. The use of innovative CONTRACK technology required precise preparation. Each slab was individually designed for tracks geometry, curves and turnouts, and then made in a precast concrete plant. The project used 4 prefabricated slabs. Prefabricated modules may also include not only reinforced concrete slab and steel track structure, but also full equipment – including sensors, drainage, switch drives and heating systems.
The next stage of the preparatory work was a trial assembly, carried out at the KZN plant in a scale of 1:1, using a modular system specially developed for this investment. Then, the finished elements were transported from the siding of the production plant in Krakow to the installation area and assembled on the construction site within a few hours. This precise preparation and trial assembly ensured safe and efficient execution of subsequent works.
During the replacement of the road crossing along Telimeny Street in Krakow, logistical solutions for loading, delivery and unloading of prefabricated elements were also tested. For loading in the precast factory, a large-size three-wheel gantry was used. The plates were then transported in a semi-trailer to the construction site, where the plates were unloaded and laid. For this work, not only standard equipment (crane) was used, but also specialized equipment, such as the PWP gantry and a self-propelled industrial crane with a lifting capacity of 100 t, which enabled logistics operations under the tram traction. The technologies were used as interchangeable and supportive, so that it was possible to check the possibility of working with a large and heavy prefabrication in a narrow building space *(source: Transport Publiczny)*.
To meet the schedule, all materials used the other materials used during the installation of CONTRACK panels had to allow fast and easy application and rapid achievement of required properties.

After positioning the slabs in the plan and profile, grouting with a high-strength mortar **SikaGrout®-4R** was made. SikaGrout®-4R is a ready-to-use, expansive, shrinkage compensating, self-levelling cement mortar with 0/4 mm grain size, with high strength and resistance to vibration and impact after curing.
For rail fixing and joint sealing, the proven Sika® Icosit® KC system was applied, ensuring durability and tightness. It consists of: **Sika® Icosit® KC 340/45** a flexible material based on polyurethanes with high elastic recovery, characterized by excellent insulation properties, eliminating the formation of stray currents and thus corrosion of steel elements located nearby. Sika® Icosit® KC 340/45 reduces secondary noise and absorbs vibration. It is designed for both manual and machine application, which allows for significant acceleration of work and obtaining the highest quality. 1-component polyurethane primer **Sika® Icosit KC-330 Primer** is used to prepare the substrate and improve adhesion. Rails and rail channels before bonding the filler blocks with **Sika® Icosit® KC 330 FK**, was primed with the epoxy resin **Sikadur®-53**.
The use of innovative CONTRACK technology during works significantly reduces the time needed for the modernization of road–tram crossings and minimizes the duration of tram service interruptions.
CONTRACK technology sets new standards for tram track construction in Poland and Europe, enabling fast and efficient modernization with minimal environmental impact while ensuring long-term durability through high-quality materials and precision workmanship.

PROJECT PARTICIPANTS

Owner:	Zarząd Dróg Miasta Krakowa
Investor:	Zarząd Dróg Miasta Krakowa
Contractor:	KZN RAIL Sp. z o.o.
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