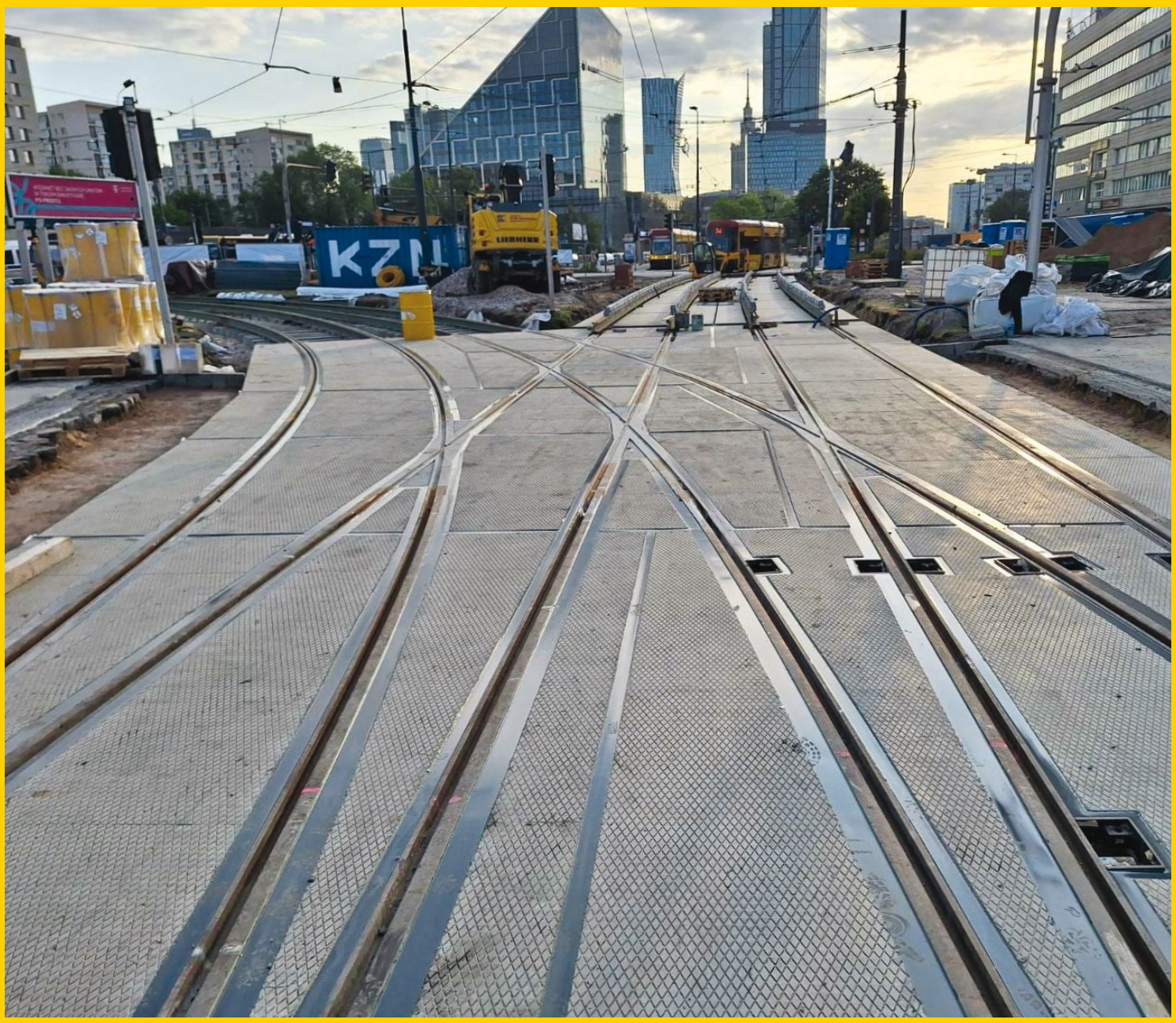


SIKA AT WORK

RENOVATION OF TRAM TRACK AND STOP PLATFORMS, ZAWISZY SQUARE, WARSAW

SIKA TECHNOLOGIES: RAILFIXING: SIKA® ICOSIT® KC SYSTEM, GROUTING MORTAR SIKAGROUT®-4 R, CURING AGENTS SIKAFLOOR® CUREHARD LI AND SIKAFLOOR® PROSEAL-12, HYDROPHOBIC IMPREGNATION SIKAGARD®-700 S

contrack POWERED BY Sika®

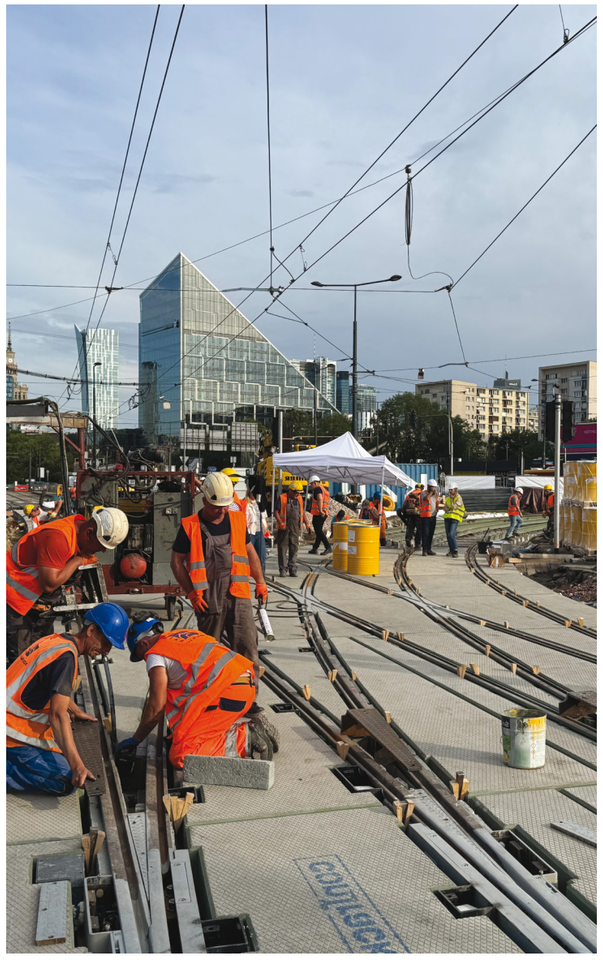
RENOVATION OF TRAM TRACK AND STOP PLATFORMS, ZAWISZY SQUARE, WARSAW

DESCRIPTION

Zawiszy Square in Warsaw is located in the city center and serves as a key transport hub. Three tram routes intersect here, with peak traffic reaching 30 to 45 trams per hour at each entrance. Over 600 trams pass through Zawiszy Square daily, carrying 138,000 to 177,000 passengers. It is also an important crossroads for road traffic.

The renovation included about 737 meters of a single track and three tram stops along Jerozolimskie Avenue on the eastern side of the intersection. The aim of the renovation was to improve urban infrastructure and improve streamline traffic flow, enhancing comfort and safety for passengers.

Source: Urzad m.st. Warszawa



PROJECT REQUIREMENTS

Renovation works in such a critical location required special attention during planning and design to minimize disruptions to both tram and road traffic. To achieve this, the reconstruction of the tram track at Zawiszy Square was carried out using an innovative technology of prefabricated turnout slabs – CONTRACK.

The scope of the project included, among others, the reconstruction of the track in the area of intersection in three phases, each involving: removal of the existing surface, 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 of tram traction, road pavement surfaces, sidewalks, etc.

SIKA SOLUTIONS

Maximum acceleration of works and minimization of traffic disruptions during tram track reconstruction were achieved thanks to the innovative CONTRACK prefabricated slab technology. The use of innovative CONTRACK technology required precise preparation. Each slab was individually designed to match track geometry, curves and turnouts, and then made in a precast concrete plant. The project used 121 large-size prefabricated slabs with a total area of about 1600 m^2, and the largest of them was 23 m^2. About 540 m^3 of concrete were used. Prefabricated modules 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 siding of Warsaw Trams and assembled on the construction site within a few hours. This precise preparation and trial assembly ensured safe and efficient execution of subsequent works.

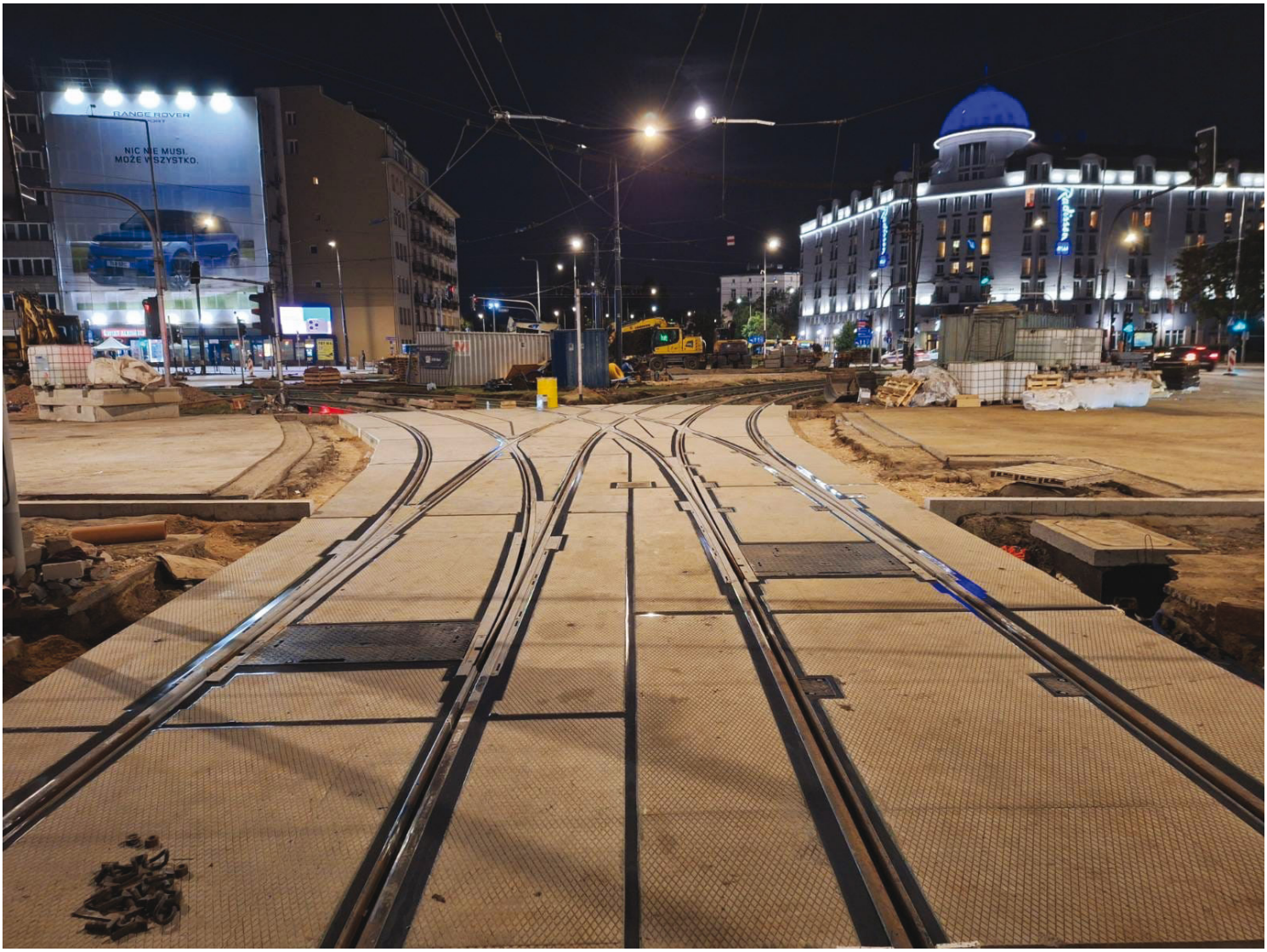
To meet the schedule, all materials used had to allow fast and easy application and rapid achievement of required properties.

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 vibration and secondary noise. It is designed for both manual and machine application, which allows for significant acceleration of work and obtaining the highest quality. A single 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.

To ensure the longest possible service life of the prefabricated slabs in adverse environmental conditions, their surface were sealed with **Sikafloor® CureHard LI** and **Sikafloor® ProSeal-12**, which reduce the absorption of the concrete, improving abrasion and UV resistance. Additional protection was provided by **Sikagard®-700 S** hydrophobic impregnation, reducing chloride ions penetration and migration as well as contamination from daily use.

The use of innovative CONTRACK technology shortened reconstruction time significantly. In the case of Zawiszy Square, all the works were completed within 5 weeks, compared to at last 3 month using conventional technology. 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

Project owner: Tramwaje Warszawskie
Investor: Tramwaje Warszawskie
Contractor: KZN rail Sp. z o.o.
Sika Poland: Tomasz Wesołowski, Wiktor Karpała

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