

Elastic Rail Fixing to Reduce Vibration and Secondary Noise in the City Centre

Karmelicka Street Tram Line, Kraków, Poland

Rail Fixing

Sika@Work



BUILDING TRUST



Project description

Karmelicka Street is part of an important tram corridor connecting Kraków city centre with the western districts of the city. Its modernization formed the second stage of the wider reconstruction of the tram route towards Bronowice.

The project included the reconstruction of approximately 1.5 km of single tram track, constructed using 18 cm thick prefabricated reinforced concrete slabs, together with associated road and urban infrastructure works. The modernization was intended to improve tram operating conditions and passenger comfort while reducing noise and vibration in the densely developed city-centre environment.

Project requirements

The new track construction required the prefabricated reinforced concrete slabs to be isolated from the supporting structure to reduce the transmission of vibration and secondary noise generated by passing trams.

At the same time, the rails had to be continuously and elastically fixed within channels in the precast slabs. The system needed to provide durable rail support, vibration damping and electrical insulation while accommodating the dynamic loads generated by regular tram traffic. Execution time was limited and access to the construction site was restricted due to the central urban location. Material supply and installation therefore had to be carefully coordinated with the construction program.

Sika solutions

The complete reinforced concrete track slab was installed on Sylomer® MFSTP polyurethane vibration-isolation mats, creating an elastic layer between the track structure and its supporting substrate. The system reduces vibration transmission and consequently limits secondary structure-borne noise in the surrounding buildings.

Within the prefabricated track panels, the rails were continuously embedded using Icosit® KC 340/45. The elastic polyurethane system provides reliable rail support while absorbing vibration and dynamic loads generated by tram traffic.

The system was complemented by Icosit® KC-330 Primer for substrate preparation and Icosit® KC 330 FK for flexible bonding of filler blocks. Where installation conditions involved wet substrates or fresh concrete, Sikadur®-53 epoxy resin provided the required bonding performance.



Sika products

Rail Fixing & Track Systems:

- Icosit® KC 340/45
- Icosit® KC-330 Primer
- Icosit® KC 330 FK
- Sikadur®-53

Project participants

Project owner	Gmina Miejska Kraków
Investor	Zarząd Infrastruktury Komunalnej i Transportu w Krakowie
Designer	TDM Projekt Sp. z o.o.
Main contractor	ZUE S.A.
Sika Organization	Sika Poland Sp. z o.o.



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