

Elastic Rail Fixing to Reduce Vibration and Secondary Noise in an Urban Tram Tunnel

Kraków Fast Tram Tunnel, Kraków, Poland

Rail Fixing

Sika@Work



BUILDING TRUST



Project description

The Kraków Fast Tram Tunnel forms an important part of the city's fast tram network, providing a dedicated underground connection between Rondo Mogiłskie, Dworzec Główny and Politechnika. The approximately 1.4 km long tunnel includes two underground stops beneath the city center.

Constructed in 2007–2008, the project comprised approximately 2,480 m of tram track and 236 m of access ramps. To provide reliable rail support while minimizing the impact of tram traffic on the surrounding urban environment, Sika supplied a complete elastic rail fixing and vibration isolation solution.

Project requirements

The tram track system had to provide high mechanical resistance and long-term durability under continuous dynamic loading while allowing precise rail alignment and maintaining the required operating speeds. As the tracks run through an underground tunnel and stations in a densely developed urban environment, effective protection against vibration and secondary structure-borne noise was a key requirement. The rail fixing system also needed to provide high electrical insulation to reduce the effects of stray currents.

In addition, the project required fast and efficient installation within a restricted construction schedule, together with a durable system designed to minimize maintenance and life-cycle costs.

Sika solutions

Sika supplied a complete light mass-spring system combining prefabricated track slabs, continuous elastic rail fixing and vibration isolation. Approximately 70 tons of Icosit® KC 340/45 were used to continuously embed and elastically support the rails within the prefabricated track slabs. The polyurethane rail fixing system provides high mechanical resistance and elastic recovery while helping absorb dynamic loads and vibrations. Its high electrical resistance also provides effective insulation against stray currents.

The track slabs were installed on approximately 5,000 m² of Sylomer® MFSTP vibration-isolation mats. The carefully selected elastic support reduces the transmission of vibration from passing trams into the tunnel structure and consequently minimizes secondary noise in the surrounding environment.

Together, the Icosit® KC and Sylomer® systems provided a durable track solution combining precise rail alignment, passenger comfort, vibration isolation and low life-cycle costs.

Sika products

Rail Fixing:

- Icosit® KC 340/45
- Sylomer® MFSTP

Project participants

Project owner	City of Kraków
Investor	Agencja Rozwoju Miasta Kraków
Designer	MP Mosty
Main contractor	Budostal 5, ZUE
Subcontractor	NTB
Sika Organization	Sika Poland Sp. z o.o.



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