Case Study Extension of the East London Line

London Overground rail network

getzner
the good vibrations company

Elastic solutions for track superstructures

Project description

Extension of the East London Line

As part of linking the East London Line into the London Overground rail network, the existing East London Underground Line was extended in both directions and overhauled at the same time. While this underground line was rather unimportant in the past, following its integration with the London Overground network the East London Line is now a central transport corridor for the entire region. The opening of the East London Line took place in 2010.

Trusted project partners

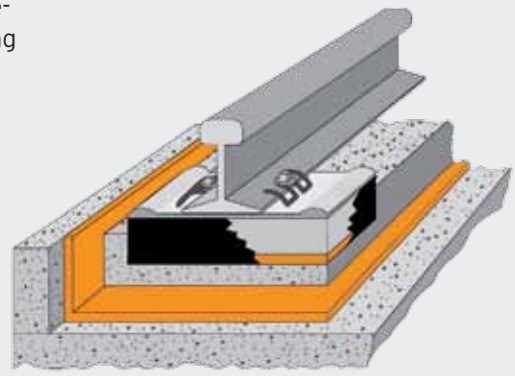
The railway design for the new section of the East London Line between Dalston Junction and Shoreditch High Street was done by Balfour Beatty Rail and were supported, in the area of concrete track slab and mass-spring system design, by the Zurich-based engineering office Heierli AG. Transport for London (TfL) commissioned a joint venture of Balfour Beatty and Carillion as the general contractors, a consortium of two of the largest construction firms in Europe. This joint venture in turn commissioned Getzner Werkstoffe with delivery of the elastic components for the entire track superstructure.

The East London Line passes through tunnels and also traverses several bridges and viaducts, some of which have tight curve radii. The challenge was to plan a superstructure system for the various permanent way structures which could be implemented along the entire line. Above and beyond this, numerous buildings along the line needed to be protected against vibrations.

Elastic systems

Combination of LVT and mass-spring system

The planners in charge of the project decided on a combination of light mass-spring systems and individual concrete sleepers on an elastic pad. As a result, it was possible to construct suitable superstructures for all of the different structures. For the entire slab track section including the turnouts, the Low Vibration Track (LVT) superstructure system was used. In track sections with more stringent requirements, the LVT system was complemented with a light mass-spring system using Sylomer® mats by Getzner. Construction of the track was rendered much easier and faster by the continuous use of the LVT superstructure.



LVT System

The LVT system uses reinforced concrete blocks which are separated from the concrete of the track slab by a rubber boot. On the bottom of the concrete blocks, the rubber boot has an elastic insert pad, in this particular case made of Getzner's Sylodyn® material. The Sylodyn® insert pad has a precisely defined thickness and stiffness in order to ensure uniform rail deflection and thus guarantee continuous track elasticity.

Mass-spring system

With regard to the bearings for the light mass-spring system, the engineering office specified mats that must exhibit the necessary physical properties, with excellent durability and high quality. Getzner Werkstoffe's Sylomer® MFS 2255 comprehensively satisfied the tender requirements for physical properties in terms of durability and quality.

Tuning stiffness

With the help of transition zones, the contractors were able to adjust the stiffness in the areas of transition between standard track superstructure without a mass-spring system and standard track superstructure with a mass-spring system. Also a transition zone was installed where slab track changed to ballasted track. Compared to the mats which were regularly used, the Sylomer® mats installed in these transition zones had a different stiffness.

Color coding for orientation

In order to ensure that there would be no confusion between the mats for the regular parts of the track and the transition zones, on the customer's request, Getzner produced the Sylomer® mats with different stiffnesses in two different colours. This production change made a large difference in terms of simplifying transport, storage and installation of the mats.

Side mats made of Sylomer® MFS 2255 were another component of the light mass-spring system. These mats were installed to ensure complete de-coupling of the track slab and to prevent any sound bridges. The side mats were installed vertically on both sides of the track slab. The height of the side mats depended on the thickness of the track slab.

In order to neutralize the shearing forces arising in the floating slab, so-called 'shear keys' were built into the concrete trough. These shear keys also had to be insulated in order to prevent sound bridges. A combination of the materials Sylomer® and Sylodyn® was used for this, which was installed on the construction site together with the other mats for the mass-spring system. Here again, colour coding of the materials made the installation work much easier.

Getzner employees were on-site to assist, in particular when the Sylomer® bearings began to be installed, as well as throughout the construction phase. They were in direct contact with the workers to show how quick and easy it is to install the Sylomer® mats. Many construction companies gladly take advantage of this service offered by Getzner.

Getzner Werkstoffe: developer, manufacturer and installation consultant

Getzner Werkstoffe is more than just a developer and manufacturer of materials for vibration mitigation and isolation. The company is also an experienced consultant in all construction engineering issues related to vibration and isolation. Getzner's experts are integrated into the system development and implementation of projects right from the very beginning.

Data and facts at a glance

Project East London Line

Operator:	Transport for London
Construction period:	October 2006 to January 2010
Track length:	Complete track length with LVT: ~11km Combination LVT + light mass-spring system: ~1,3 km Turnouts with LVT: 18 Turnouts with LVT + light mass-spring system: 8
Planned opening:	April 2010
Contract volume:	EUR 1.2 million
Solution:	Combination of LVT and mass-spring system
Volume of materials:	90 tons of PU materials by Getzner
Line capacity:	35.4 million passengers per year

Getzner Werkstoffe GmbH

Founded:	1969
Managing Director:	Dr. Roland Pfefferkorn
Employees:	173 in Bürs; 91 abroad
Sales (2009):	EUR 52.3 million
Business areas:	Rail, construction, industry
Production volume (2009):	7,022 tons of technical PU materials
Recycling 2009:	32 tons of residual PU materials
Locations:	Bürs (A), Munich (D), Berlin (D), Amman (JOR), Tokyo (J), Kunshan (RC), Pune (IND)
Ratio of exports:	80 percent

This project was realized in cooperation with our UK Agent:

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