EAST LONDON LINE EXTENSION

CASE STUDY
East London
Line (UK)

VIBRATION ISOLATION AND PROTECTION OF THE ENTIRE RAILWAY SUPERSTRUCTURE.

getzner

ELASTIC SOLUTIONS FOR TRACK SUPERSTRUCTURES

THE PROJECT

As part of integrating the East London Line into the London Overground rail network, the former underground line was extended in both directions, comprehensively upgraded and reopened in 2010. With this expansion and its connection to the Overground network, the East London Line transformed from a previously minor route into a key transport corridor for the entire region.

Trusted project partners

The railway design for the new section of the East London Line between Dalston Junction and Shoreditch High Street was carried out by Balfour Beatty Rail, supported by Heierli AG (Zurich) in the areas of slab-track and mass-spring-system design. Transport for London commissioned a joint venture of Balfour Beatty and Carillion – a consortium of two of the largest construction firms in Europe – as the general contractor. This joint venture subsequently commissioned Getzner to supply all elastic components for the track superstructure.

The East London Line passes through tunnels, bridges and viaducts, some with tight curve radii. A superstructure solution was therefore required that could be applied across all structure types, while also ensuring effective vibration isolation for the many buildings located along the route.

ELASTIC SYSTEMS

The planners selected a combination of light mass-spring systems and concrete sleepers on elastic pads to meet the diverse structural requirements of the East London Line.

For all slab-track sections, including the turnouts, the Low Vibration Track (LVT) system was installed. In areas with more stringent vibration requirements, the LVT system was supplemented with a light mass-spring system using Sylomer® mats. The continuous application of the LVT system across the project simplified design and significantly accelerated construction.

LVT System
The LVT system consists of reinforced concrete blocks that are separated from the slab track by a rubber boot. At the bottom of each block, the boot contains an elastic Sylodyn® insert pad with precisely defined thickness and stiffness to ensure uniform rail deflection and consistent track elasticity.

Mass-spring system
For the light mass-spring system, the planners specified mats with defined physical properties, long-term durability and high quality. Getzner's Sylomer® MFS 2255 met these requirements in full and was chosen as the bearing material for the system.

Tuning stiffness
Transition zones were used to adjust stiffness between areas with and without a mass-spring system, as well as between slab track and ballasted track. Sylomer® mats with stiffness properties differing from the regularly used mats were installed in these transition zones.

Colour coding for orientation
To avoid confusion between mats for regular track areas and those for transition zones, Getzner produced Sylomer® mats with different stiffnesses in two colours, as requested by the customer. This colour coding greatly simplified transport, storage and installation.

Side mats made of Sylomer® were also used as part of the light mass-spring system. Installed vertically on both sides of the slab, they ensured complete decoupling and prevented sound bridges. Their height depended on the slab-track thickness.
To neutralize shear forces in the floating slab, shear keys were integrated into the concrete trough and insulated with a combination of Sylomer® and Sylodyn®. These materials were installed on site together with the other mass-spring system mats, with colour coding again helping to ensure correct placement.
Getzner employees supported the installation of the Sylomer® bearings and were present throughout construction. They worked directly with the contractors to demonstrate the quick and easy installation of the Sylomer® mats – a service appreciated by many construction companies.

Getzner Werkstoffe: developer, manufacturer and installation consultant
Getzner Werkstoffe is not only a developer and manufacturer of materials for vibration mitigation and isolation, but also an experienced consultant for all construction-engineering matters related to these fields. The company's experts are involved from the earliest stages of system development through to project implementation.

ADVANTAGES

Mass-Spring Systems full-surface

Under Sleeper Pads

Sleeper Boot Insertion Pads

- Effective vibration and noise reduction for sensitive urban surroundings.
- Uniform track elasticity across complex structures and transition zones.
- Protection of the entire superstructure, increasing durability and service life.
- Simplified and faster installation through integrated elastic systems.
- Reliable long-term performance for a high-capacity metropolitan rail line.

Operator	Transport for London
Implementation	October 2006 to January 2010
Track length	Complete track length with LVT: approx. 11 km Combination LVT + light mass-spring system: approx. 1.3 km Turnouts with LVT: 18 Turnouts with LVT + light mass-spring system: 8
Solution	Combination of LVT and mass-spring system using 90 tons of PU materials by Getzner
Capacity	35.4 million passengers per year

Additional references can be found on our website:

getzner.com/ references

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