



# SIKA AT WORK

KEEPING LONDON TRAMS MOVING WITH A  
NEW STANDARD FOR UK TRACK RENEWAL

**PRODUCTS USED:**

Sika® Icosit® KC 350/45

Sika® Primer-115

Sika® Icosit® KC 330 FK NEW

BUILDING TRUST



## AT A GLANCE

# THE FIRST USE OF SIKA® ICOSIT® KC 350/45 IN A MACHINE-APPLIED SYSTEM ON A UK TRAM NETWORK SETS A NEW DIRECTION FOR FASTER, PRECISE AND MORE DURABLE LIGHT RAIL AND TRAM TRACK RENEWAL

On a busy section of a South London tram network, the rail infrastructure had reached the end of its service life and required renewal with minimal disruption to regular services. During a short closure VolkerRail needed a rail embedment solution that could be installed within tight working conditions, cure rapidly and deliver reliable long-term performance under constant use.

By selecting Sika's Icosit® polymer rail embedment system, which uses Sika's innovative Icosit® KC 350/45 polymer, a pioneering new model for track renewal in the UK has been introduced. Applied using specialist machine technology and larger, easily recyclable drums, the new Icosit® polymer not only has faster curing properties, but also reduces environmental waste, enhances passenger ride quality, reduces noise vibration, and improves working conditions for those applying the product. These cutting-edge improvements ensured the project was completed speedily and successfully with minimal impact on tram users, demonstrating how innovation in both the product and application method, has advanced the future of tram and light rail maintenance.



## THE CHALLENGE

Maintaining and renewing track infrastructure on a live tram network brings many challenges. Passengers rely on their regular tram service and delays have a big impact on their daily lives. Additionally, the downtime caused by track renewals and maintenance has an immediate knock-on effect across the wider transport system, so the disruption can be far reaching.

Having reached the end of life, the existing rails and embedment system on this busy section of a South London tram network needed to be replaced to protect reliability, ride quality and long-term performance of the line. Closures had to be tightly controlled as this is a route used by commuters, school pupils and residents for 19 hours every day, so there was little room for downtime.

VolkerRail was appointed to bring the track up to modern standards while keeping disruption to a minimum. The works formed part of a wider programme on the network to improve reliability and comfort for passengers.



For this project, VolkerRail selected Sika's evolutionary Icosit® polymer rail embedment system, centred around Sika® Icosit® KC 350/45 and supported by Sika® Primer-115 and Sika® Icosit® KC 330 FK NEW. This project marked the first time\* this machine-applied Icosit® system had been used on a tram network in the UK, introducing a new, groundbreaking approach to the delivery of track upgrades and renewal.

Work had to be carefully planned around the short closure. The track sits alongside public areas and roads and access is limited, so every hour of access had to be used efficiently and effectively.

VolkerRail needed a solution that could not only be installed within tight working constraints and ensure a fast return to operation, but also one that had clear environmental benefits. They were also looking to see improvements in the method of application, which typically involved the pouring of materials into the rail channels by hand from small 12 litre tins.

Speed of installation, reduced downtime, improved sustainability and better performance and durability were the key factors in their choice for the right partner and system.

## Jamie Kelly, Programme Manager at VolkerRail, said:

*"Working with Sika on this project has been a genuinely collaborative experience. Their team brought a lot of technical knowledge and expertise and were always willing to work through challenges with us on site to find the right solution. It was important that we didn't just find the right system for the tracks, but also the right partner to work with."*

*"That collaborative approach also extended to the technology being used on site. The machine application system has been a big step forward in how we deliver rail embedment, giving us far better control over placement and helping the team work more efficiently. As a business, we're always looking at how new technology can help us deliver projects in a more sustainable way, so it's important for us to work with solutions that bring environmental improvements as well as technical ones. The move to larger lined drums and the ability to recycle them has helped reduce waste compared with traditional hand-poured methods, which in turn has helped us to meet our sustainability targets."*

## THE SOLUTION

Having reviewed the available options, VolkerRail selected Sika's Icosit® elastic rail embedment system which stood out owing to its innovative properties and application methods. At the core of this solution was Sika® Icosit® KC 350/45, a load-bearing, flexible polyurethane grout developed for demanding rail environments. Designed to dampen vibration while withstanding constant use and stress, it forms an elastic system that absorbs movement rather than transferring stress back into the rail and surrounding structure, which leads to greater durability and longer track lifespan. The result is a reduction of mechanical wear on tram vehicles and rail, ensuring permanent rail alignment resulting in track geometry stability and uniform load distribution. The product's electrical isolation properties also ensure protection from stray current corrosion.

Sika's Icosit® KC 350/45 offers sufficient time for safe and accurate placement, gaining strength rapidly by curing up to six times faster than more traditional systems. On a live tram network, this faster curing time directly shortens closure periods, minimises disruption and allows earlier returns to service. The system was supported by a Sika primer to prepare the substrate and Sika® Icosit® KC 330 FK NEW as part of the wider embedment system, ensuring compatibility, durability and safe and secure bonding.

Just as significant as the material itself was the method of application. Previously, rail embedment materials were delivered in 12 litre tins and installed by hand pouring into the rail channel, but this involved misplacement losses of between 10 and 20 per cent. On this project, the Icosit® system was supplied in 200 litre drums and mixed and applied using specialist machinery provided by partners NTB Systems (owned by Grupa ZUE), pumping the material directly into the rail channel - with a specially created applicator, ensuring far greater accuracy, consistency and control.

For the workforce, the benefits were just as clear. The machinery handled mixing and delivery, reducing heavy lifting and repetitive strain on backs and shoulders. Fewer people were required for the application, and the process was more manageable within tight time constraints; however, this material can still be hand-poured when needed.



## A CLEANER INSTALLATION WITH LONG-TERM IMPACT

Moving from single-use 12 litre hand-poured tins to machine mixing and pumping from 200 litre lined drums brought immediate benefits to the project. The installation process itself was cleaner and more controlled, contributing to better environmental performance across the works area.

The controlled and more accurate machine application method brought waste and spillage loss down from up to 20 per cent to under 5 per cent. And the improved placement accuracy meant less reworking was required bringing further reductions in wastage and labour costs.

The environmental benefits of using the larger drums were clear. Each drum is fitted with a removable liner and once empty, the liner is simply lifted out and disposed of safely, leaving a clean steel drum ready for standard recycling. This simple change reduced the large volumes of non-recyclable waste seen with the single-use 12 litre tins and also meant a dramatic reduction in expensive disposal charges.

And the sustainability story doesn't end once the material is applied. Sika® Icosit® KC 350/45 forms an elastic, load-bearing system that dampens vibration and reduces noise as trams pass over the rails. By absorbing these stresses, it helps extend the life of the track and surrounding structure, as well as reducing wear on the actual trams. This long-term performance means less maintenance is required, which in turn means fewer closures, less repeat work and reduced material consumption over the life of the tram line. When rails do eventually need replacing, the Icosit® material can be removed using hydro-blasting, which leaves the trough clean and doesn't damage the substrate. The trough simply needs to dry out before priming and installing the new rail. This provides a much more efficient removal method, reducing the need for demolition, waste and disposal when compared with traditional systems, which require sawing and cutting out the concrete via mechanical preparation.

Sika's product is virtually maintenance-free with any maintenance generally limited to the track itself rather than the embedment system. While straight tracks are required to be replaced after 18 years and tracks on a radius approximately every seven years, the Icosit® system is designed to last the full life of the track. Indeed, in some cases Icosit® products have remained in situ for over 30 years.

The combined effect of this technology is not only a smoother, quieter journey for passengers and improved quality of life for nearby residents, but a more sustainable whole-life approach to tram infrastructure.

## THE RESULTS

The launch of the first machine-applied Sika® Icosit® KC 350/45 marks the beginning of a whole new generation in track renewal in the UK.

Thanks to the faster curing performance of this advanced product and the precision that the machine application brings, trams returned to service far quicker than would have been possible with previous methods, reducing downtime on this busy route and helping passengers get on their way.

Sustainability was also built into the way the project was delivered. Material losses were reduced to below 5 per cent, disposal of single use packaging was slashed thanks to the large recyclable drums with removable liners, and the cleaner installation process lowered overall site waste.

Future maintenance costs will also reduce owing to the excellent durability and elasticity of the product. With vibration lessened, movement is better absorbed and this results in a longer track lifespan. It also means greater passenger comfort and less noise.

As the first UK tram scheme to adopt this machine-applied Icosit® system, the project shows how speed, performance and environmental responsibility can be delivered together, setting a new advanced direction for tram and light rail renewal in the UK.



### David Collins, National Business Development Manager at Sika, added:

*“The machine-applied system brings a real improvement in efficiency on site. Each drum takes around a minute and a half to mix and the material can then be delivered directly into the rail channel at roughly ten litres per minute. That creates a fast but steady and controlled installation process, reduces the risk of mixing errors and waste, plus it helps take some of the physical strain away from teams, especially when compared with traditional hand mixing and pouring.”*

*“The lined drum system also leaves a clean drum once the liner is removed, which means it can be recycled rather than treated as contaminated waste, helping to keep disposal costs down to virtually nothing.”*



\* Successfully used in Europe and in UK trials.

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