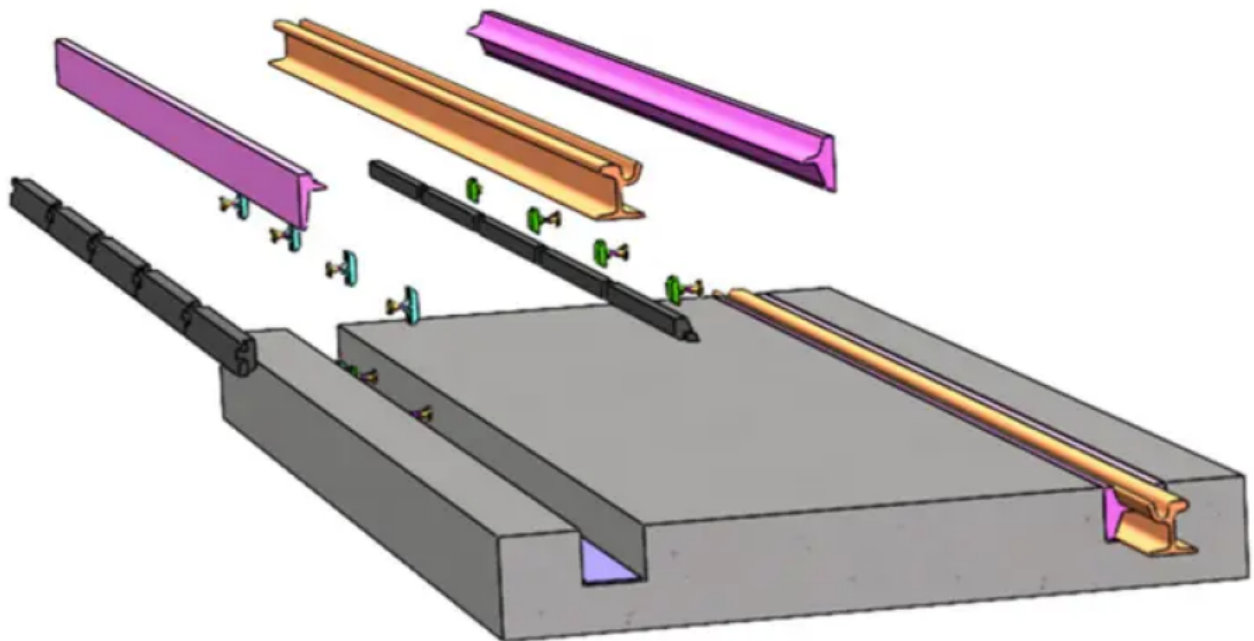


Changmei Technology Embedded Rail: Continuous Grooved-Rail Support with Polymer Casting for Shared Tramways



Baoji, Shaanxi Sep 10, 2026 ([IssueWire.com](https://www.issuewire.com)) - Modern urban tramways often share surface space with road traffic, creating structural and acoustic demands that differ from conventional sleeper-and-fastener track. Changmei Technology's [Embedded Rail System](#) is designed for tramway level crossings and mixed-traffic sections where road and rail occupy the same surface. The grooved rail is continuously fixed and supported within a recessed concrete slab, while polymer casting material forms

the resilient load-transfer medium around the rail and leaves the running surface exposed. Wedge-type adjustment components secure lateral position and resist uplift, while shims provide elevation correction. Together, these elements create a continuously supported embedded track structure for shared-surface tramway sections.

Continuous Support Replaces Concentrated Fastening Points Along the Rail

The defining structural advantage of the Embedded Rail System is its shift from discrete fastening points to a continuously fixed and supported configuration along the entire length of the rail. This continuous support allows wheel-rail loads to be transferred uniformly into the recessed concrete slab via the polymer medium, fundamentally altering the track's stress distribution.

In traditional track systems, load transfer is concentrated at individual sleeper fastenings, which inherently induces localized bending stresses in the rail segments between these fixed points. A continuously supported rail drastically reduces this localized bending, which in turn minimizes long-term fatigue accumulation under cyclic transit loading.

This resulting uniformity in vertical and lateral stiffness distribution is particularly critical at at-grade crossings and tram-road shared rights-of-way. By stabilizing the entire rail length, the continuous interface helps control the unevenness that typically develops between the rigid steel rail and the adjacent flexible road pavement, directly reducing the dynamic disturbances felt by both tram vehicles and road traffic.

Polymer Casting Combines Load Transfer and Acoustic Isolation

The high-performance polymer compound in the Embedded Rail System serves as both a structural support medium and a resilient interface. It is cast around the grooved-rail profile within the recessed concrete trough, leaving the running surface exposed according to the track design. Once cured, the polymer becomes part of the ERS load path between the rail and the surrounding concrete structure.

The resilient polymer layer reduces rigid rail-to-concrete contact and helps control the transmission of ground-borne vibration through the shared-surface track structure. By supporting the rail along its length, the cast material also contributes to a more uniform interface between the steel rail and the recessed concrete trough.

The Embedded Rail System combines the polymer casting material with an elastic rail pad and gauge-adjustment components. These elements work together within the recessed track structure: the cast polymer carries and distributes load, the elastic pad contributes local resilience, and the adjustment components maintain the required rail position.

Wedges and Shims Separate Gauge Control from Elevation Correction

To maintain precise track geometry within the polymer matrix, the system intelligently separates gauge positioning from elevation control. Wedge-type rail adjustment components are strictly responsible for securing lateral positioning and preventing rail uplift under intense traction or braking forces. Meanwhile, specific shims are placed beneath the rail to handle all elevation corrections.

The wedge geometry acts as a mechanical lock, maintaining the rail's transverse alignment without relying on traditional exposed fastening clips. This allows the continuously supported ERS structure to retain gauge and uplift control while the rail-positioning elements remain integrated within the recessed

track assembly.

Conversely, the shims provide a vital mechanism for correcting rail elevation during the initial construction phase or subsequent track maintenance. By separating these two adjustment planes, construction crews can fine-tune the rail top elevation to perfectly match the adjacent road surface without disrupting the lateral positioning logic of the wedges.

A Wide Grooved-Rail Base Improves Stability at Shared-Surface Sections

The physical profile of the grooved rail itself plays a vital role in the stability of the embedded system. The wide base flange of the grooved rail provides a broad, secure foundation for support and anti-overturning resistance, which is essential for tracks that are continuously exposed to road traffic, significant temperature differentials, and heavy surface loading.

Shared-surface sections are uniquely demanding because they must simultaneously bear the heavy axle loads of the tramway and the erratic loading patterns of road vehicles. A wider rail base within the polymer medium establishes a highly stable embedment geometry, actively enhancing the track's overturning and buckling resistance while reducing localized tilting tendencies.

When this wide base is combined with continuous support, the vertical and lateral stiffness is distributed evenly across the slab. This structural optimization specifically targets and mitigates the severe pavement cracking and localized settlement risks that frequently plague poorly designed level crossings.

Material Coordination Keeps ERS Support Continuous

The Embedded Rail System is built from a coordinated material and adjustment set around the continuously supported grooved rail. Polymer casting material, an elastic rail pad, gauge-adjustment blocks, and rail-positioning elements each perform a defined role within the recessed concrete trough.

The polymer casting material forms the principal resilient support and load-transfer path, while the elastic pad contributes local compliance and the gauge-adjustment components control rail position. Integrating these functions within one ERS structure allows track geometry and support conditions to be managed as part of the same embedded installation.

This coordination is especially important at shared-surface sections, where the track must maintain rail geometry while limiting vibration and controlling the interface between the steel rail and adjacent pavement. ERS selection therefore depends on the complete continuous-support geometry, polymer material arrangement, and adjustment strategy used for the specific tramway section.

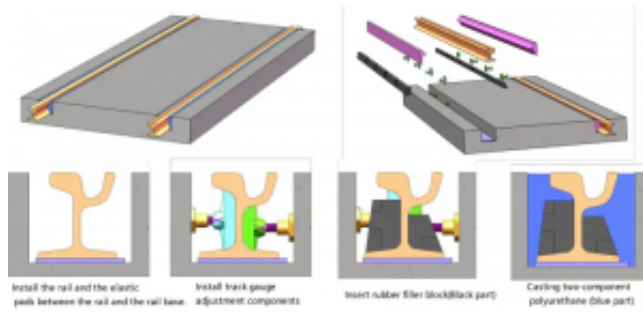
Project-Based Supply Connects Embedded Geometry with Installation Execution

The ultimate engineering value of an embedded rail system depends entirely on the flawless synchronization of the concrete civil works, the rail elevation tolerances, the road-rail interface, and the polymer pouring process. [Changmei Technology](#) addresses this complex execution requirement through its Project-Based Supply and EPC (Engineering, Procurement, and Construction) Support, offering staged deliveries, on-site technical supervision, and post-installation performance testing.

Staged deliveries are specifically scheduled to align with the construction rhythm of long tramway lines. This precise logistical coordination prevents the premature arrival of materials, eliminating the risks of

improper on-site storage and costly interface mismatches during section-by-section construction.

This rigorous project execution is backed by a formidable corporate footprint, with the company's rail projects covering 58 cities, over 670 individual lines, and more than 9,500 kilometers of total service line. This experience supports the translation of continuous-support and polymer-casting designs into operational shared-surface track installations. For further details on embedded systems and project support, visit <https://www.changmeitech.com/>.



Media Contact

Shaanxi Changmei Technology Co., Ltd.

*****@changmeitech.com

<https://www.changmeitech.com/>

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