

# XiTRACK® Edge Beams For Lateral Track Support

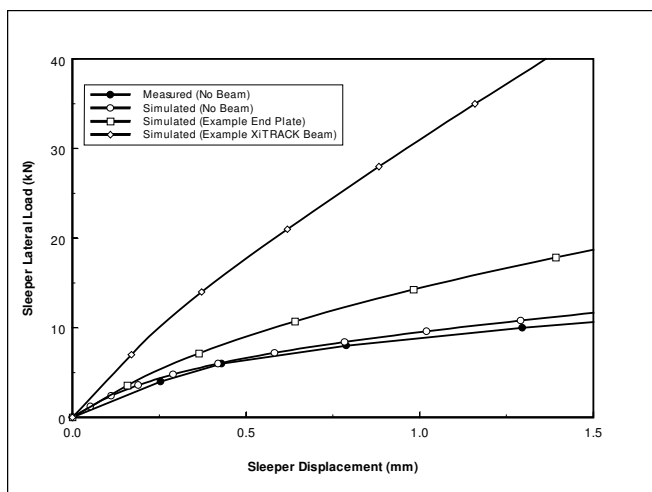
The XiTRACK Technique has been specifically developed to meet the demands of modern ballasted rail track with increasing train axle weight, line-speed and track usage coupled with reduced maintenance schedules. XiTRACK Polymer Treatment can restore track performance to intended levels by a single application of specially-designed energy-absorbing polymers to ballast or other granular track structures to form GeoComposites. It can be used to improve overall performance of maintenance and renewal sites by making a significant contribution to preserving track geometry and alignment over its working life.

Special attention has been paid so that the XiTRACK Treatment can be carried out in a wide range of temperature, weather and ballast conditions; it leaves the track fully draining. The track and ballast are pre-prepared by conventional techniques to ensure subsequent optimum performance and alignment. XiTRACK Polymer is fast reacting and the site is quickly returned to operational use. The XiTRACK GeoComposite allows the ballast to move in a controlled manner but minimises its migration.

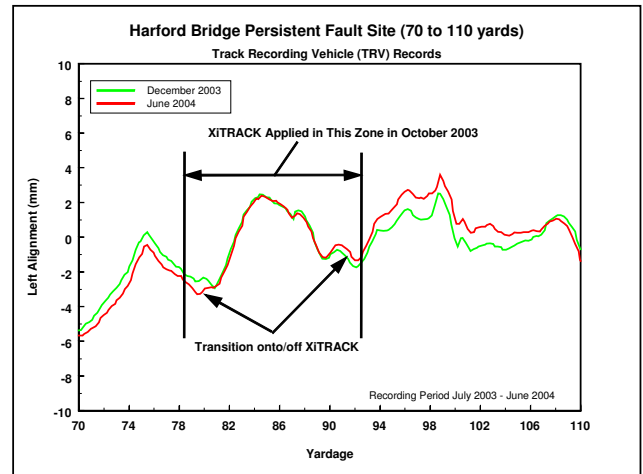
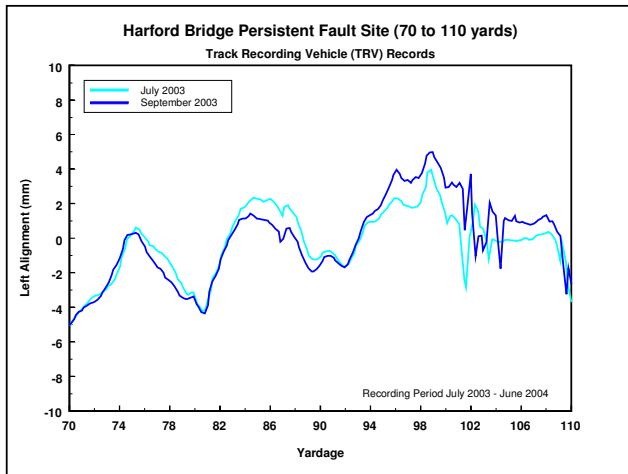
In order to improve the lateral stability of railway track XiTRACK® GeoComposite edge beams, with designs having a range of complexity, can be used as a cost-effective alternative to sleeper end plates. The benefits of using XiTRACK edge beams include:

- Rapid installation of the edge beam giving a clear cost benefit during limited possessions.
- Can be designed and used for any sleeper type.
- XiTRACK GeoComposite is designed to meet individual site constraints.
- Generates significantly more lateral resistance when compared to end plates.
- The track can be put into the correct alignment prior to treatment and thus the track is stabilised in its correct geometry.
- Complex track assets, such as S&C, can be easily treated.
- The treatment remains fully permeable and still allows a degree of flexibility to reduce wear on the rails.
- The level of lateral resistance increase can be modified as part of a design process.
- The treatment is designed to last the lifetime of the ballast.

The graph below shows the measured and computed response of a typical railway sleeper under lateral loading. Also shown in the graph are the responses for the sleeper with an end plate and for a sleeper stabilised using a XiTRACK edge beam (a typical edge beam is shown). A clear increase in the horizontal resistance of the track is observed. The photograph below shows the application of a XiTRACK edge beam adjacent to a fixed timber deck bridge at a site in the UK in October 2003.



In this application lateral XiTRACK edge beams were constructed to help retain alignment on curved bridge transitions at line speeds of 70mph. The graphs below shows the track alignment Track Recording Vehicle (TRV) traces prior to XiTRACK treatment and after XiTRACK treatment for the site shown in the above photograph. The traces are captured after a full track renewal has taken place.



The left graph shows the TRV trace acquired after a full track renewal, but before XiTRACK treatment. The trace indicates that lateral movement of the track is still occurring even after a track renewal. The graph on the right shows the TRV trace acquired just before (green line) and several months after (red line) XiTRACK reinforcement of the site. The traces indicate that lateral movement of the track has been stabilised in the treatment zone using XiTRACK (indicated by the TRV traces lying on top of each other over the treatment area). Outside of the treatment zone the track continues to move laterally. The benefits of using XiTRACK beams, to improve the lateral stability of railway track, are therefore demonstrated.

### **XiTRACK Polymer Application**

Each polymer grade specified by the mathematical model output is supplied as two components and applied by pouring onto track structures in a carefully monitored distribution pattern to match the design using approved mixing equipment and specially-trained teams. In no sense is the XiTRACK Polymer sprayed or injected on site and its use satisfies the requirements of the Environmental Agency in the UK. The applied polymer is fast curing; the treated site can be walked on in a matter of minutes and returned to traffic in an hour or so, depending on the system. In the event that a treated area has to be removed, conventional equipment can be used.

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