

Smartpile Track Bed Stabilisation System

from Unipart Rail

Geotechnical engineering solutions for live railway environments.



Applications:

- New embankment construction
- Highly loaded locations
- Soft ground including clays and peat
- Made ground and variable subgrades
- Transitions from ballasted track to track slab or on/off structures

Van Elle's mini-pile track bed stabilisation system applies proven geotechnical engineering solutions to the live railway environment to address challenges with poor track geometry and subgrade failure resulting in speed restrictions and high maintenance costs.

It is one of a suite of specialist piling and ground improvement techniques designed and installed by the Group's rail division, part of the UK's largest ground engineering contractor.

The Smartpile system, developed in partnership with Network Rail throughout CP5, is installed on-track through the ballast, between sleepers in rules of the route possessions. Uniquely configured heavy capacity road-rail piling machines are used, with patented masts and a modified and patented screw pile system.

It has numerous advantages compared to traditional disruptive 'track-out' solutions and grouted systems or driven mini-piling solutions.

125

Year
design life

5 mins

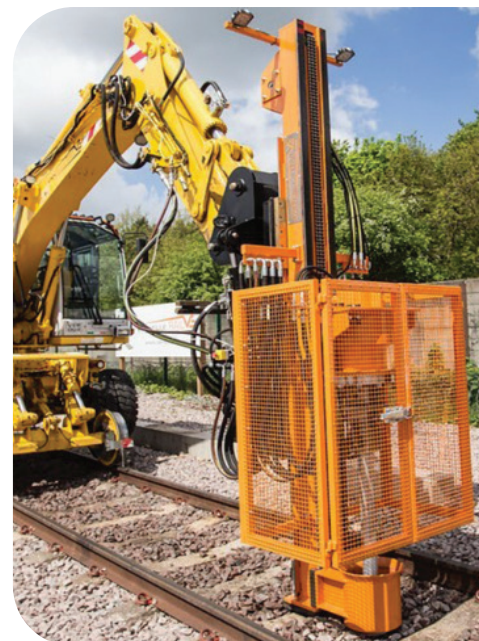
Installation
time per
4m pile

3000+

Piles installed on
Network Rail, TfL &
Irish Rail Infrastructure

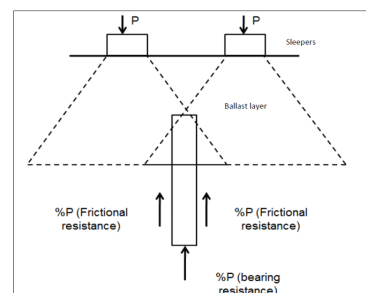
Up to **60%**

Reduction in
track deflection



Technical Features & Benefits

- Significant time, cost, service disruption and environmental benefits over traditional track-out approaches
- Patented pile cap detail allows controlled cut-off below tamping zone allowing normal maintenance and renewal activities to continue after installation
- No risk of grout contamination or heave of the track ballast or ground associated with grouted systems and avoids the risk of ground disturbance, vibration and noise and associated with driven systems
- Smartpile is a proven solution supported by extensive measurement and verification on several projects by engineering partners Atkins and in conjunction with Network Rail, through the national CP5 TBS framework and subsequently Irish Rail
- Track deflections reduced by up to 60% based on detailed monitoring
- Rapid installation capability in a short possession window; typically less than 5 minutes for a 4m length pile



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