



### Key achievements

- Manual and Automated monitoring of critical rail assets near active landslip
- Detailed 3D Line and Level surveys to determine rail positions

- **The Project**

Keller were installing piles as part of necessary ground reinforcement works to stabilise the ground around and active landslip. Other reinforcement works included widening the embankment and improving groundwater drainage. During these works, 500 metres of Network Rail mainline tracks affected by the landslip required thorough monitoring for potential movement.

- **The Challenge**

Regular tamping was taking place on this section of the line which noticeably changes the position of the rails and the measured location of the prisms. Tamping also occasionally moves or damages individual prisms, requiring nightshift maintenance visits to adjust or replace prisms. Additionally, mainline train services needed to remain uninterrupted throughout the works.

- **The Solution**

GEO-Instruments survey teams provided a composite monitoring scheme including of over 700 specialised 3D prisms installed onto the tracks which were read by six networked Automated Total Stations (ATS). This solution allowed for high accuracy, regular readings 24 hours a day. Monitoring prisms were also installed on OLE stanchions and a nearby road bridge that passes over the monitored area of track.

Cant, twist and lateral movement of the tracks were calculated automatically in QuickView, GEO-Instruments' browser-based monitoring software. Surveys, installations, and maintenance took place during nightshift track possessions to prevent disruption to train services.

Detailed track geometry surveys were carried out before the installation of the ATS and prism network in order to establish a baseline to compare with measured differential movements.

### Application

Railway Monitoring

### Technique

Automated 3D Prism Surveys  
Track Geometry Surveys

### Market

Rail  
Infrastructure

### Project Duration

2 years

### Instrumentation

3D Prisms  
Automated Total Stations  
GRP 3000 Track Trolley

### Keller companies

GEO-Instruments  
Keller UK

