Geotechnical Engineering

Academic staff

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The Geotechnical Engineering team within the Railway Research Centre has been involved in research over a number of years to properly understand the dynamic load-deformation response and track/sub-base interactions to the benefit of; the design of new and replacement track systems, the development of remediation and maintenance strategies; the assessment of track system performance, and; the optimisation of whole life and whole system costs.

Current research is using field monitoring, advanced laboratory cyclic and dynamic tests and numerical modelling techniques to assess the potential for an improved geotechnical approach to railway track design and remediation. To this end, work has focused on the design of the track substructure, the ability of structures to withstand train induced dynamic loads and the in-situ remediation of the track support system using non-disruptive ground improvement techniques.

Over the last decade much work has been undertaken to investigate the mechanisms that lead to pumping of fines, the production of wet spots and methods of amelioration. This has led to the development of an “index” test that can be used to assess the effectiveness of using various materials at the subgrade/ballast interface to reduce pumping and the migration of fines.

Current projects:

- Rail Research UK – Engineering Interfaces
- **Project A1 – Appraisal of Track/Sub-Base Design using Modern Geotechnical Principles (http://portal.railresearch.org.uk/RRUK/Site%20Pages/ProjectA1.aspx)**
- **Project A4 – Ground/Track/Train Systems Interactions (http://portal.railresearch.org.uk/RRUK/Site%20Pages/ProjectA4.aspx)**
- Innotrack– Development of a Multi-Train Simulator
- Industry sponsored projects on substructure improvements