

ASSESSING THE PERFORMANCE OF GEOGRIDS IN TRACK OVERLYING SOFT SUB-STRUCTURES USING THE ROLLING LOAD RIG FACILITY

This report investigates the effectiveness of various measures to improve the durability of track geometry on soft sub-structures. One part of the project tested the performance of several blanketing treatments to prevent the ingress of clay into the ballast. The remaining work was to determine whether placing a geogrid in the ballast structure would improve the stability of track overlying ground with a low stiffness.

This report addresses the second of these areas, which was tested under controlled conditions using the Track Research Unit's Rolling Load Rig facility. The test programme involved creating an artificial soft sub-structure by relaying the test track on rubber bonded cork matting. The first test was conducted without the geogrid installed to provide a benchmark against which subsequent tests could be compared. By measuring the elastic deflection and the permanent settlement of the track under the action of the Rolling Load Rig it was possible to assess the durability of the vertical track geometry. In the second and third tests the level of the geogrid in the ballast was varied to assess whether there was optimum depth at which it should be installed.

The report concludes that:

- Track overlying a soft sub-structure will experience more rapid settlement and will require additional maintenance.
- By installing a geogrid within the ballast structure, the rate of settlement is substantially reduced and approaches that achieved by track on a firm foundation.
- The geogrid has a slightly stiffening effect when used on track with a soft sub-structure and will reduce the elastic deflections.
- In every test, the stiffness of the track increased marginally and had a logarithmic relationship to traffic tonnage.
- The depth at which the geogrid is installed does not appear to be significant within the range of depths tested.