TESTING OF TRACK SUB-STRUCTURE

BACKGROUND

Track substructure layers (ballast and sub-grade/formation) can have a significant influence on track performance. Differences in the condition of substructure layers can cause variations in the settlement characteristics of the track. To measure the track performance it is necessary to investigate how these layers are affected under various operating conditions so that the ballast selected can provide cost effective and technically acceptable track support.

BHP Institute of Railway Technology has the ability to conduct controlled experiments in a laboratory environment as well as extensive test programs in the field. This enables the better understanding and cross-correlation between theoretical/ laboratory test results and data collected from the actual field, under true operating conditions.

RESEARCH PROGRAMS

Detailed studies have been conducted including:

- assessment and selection of ballast, sub-ballast, formation and geotextiles
- effects of higher axle loads on track structure
- ballast stability at high speed (350kph)
- effects of increased sleeper spacing
- load transfer characteristics (rail→sleeper→ballast→sub-ballast→formation)
- assessment of formation bearing capacity
- track deflection under normal traffic conditions
- track settlement resulting from tamping
- ballast cleaning

BENEFITS

- Minimised maintenance cost resulting from selection of appropriate track structure materials
- Accurate measurement of contact pressures and bearing pressures has led to effective use of ballast and sub-ballast material
- Increased sleeper spacing has provided a potential annual saving up to $1m in capital cost

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