THE MECHANISM OF SUBGRADE STRENGTH FAILURE (CLAY HEAVE) BENEATH THE RAILWAY TRACK

This report is concerned with the case where clay subgrade beneath a granular track substructure cannot withstand the intensity of loading applied to it, and gross permanent deformation occurs. The ultimate surface manifestation of this instability is the development of mounds (heaves) of soft clay running parallel to the track along 'cess' or 'six foot' sides of the track or in some instances between sleepers in the 'four foot'. A result of the instability of the clay underlying the track is an increase in the rate of development of track top faults.

In order to recommend suitable remedial measures for this case it was decided to investigate the failure mechanism of clay beneath the track using observational methods. To do this equipment was designed and developed to (a) locate and trace the failure zone in clay subgrades, and (b) quantify the degree of instability.

This report describes the measuring equipment developed, and presents the results of investigations at several sites where clay heave was occurring. A model of the mechanism of heave is postulated and the implications with regard to maintenance discussed.

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