

AN ASSESSMENT OF DIRECTLY FASTENED TRACK BRIDGES AND ASSOCIATED TRANSITION ARRANGEMENTS

The aim of the project was to ensure adequate design for both the bridge and the track where the track is directly fixed to the bridge, i.e. directly fastened bridges, and to provide practical guidance on appropriate maintenance regimes.

Direct fixing of track to bridges has long caused problems for both track and bridge maintenance. The current situation of BR's directly fastened bridges and transition arrangements have been investigated. Some overseas practice has also been reviewed. The problem of deterioration and repair of timber waybeams is discussed. In addition a series of void measurements has been carried out under high-speed traffic. The measurements have been used in the dynamic analysis to determine track forces by using the VAMPIRE program developed by BR Research. The performance of directly fastened track bridges has been discussed. Details of both bridge structures and transition arrangements have also been reviewed.

It is concluded that a fairly large number of directly fastened bridges will continue to be in service on BR for the foreseeable future, and that such designs can provide economical and effective structures in some situations. However, the structural arrangements, waybeams, fastening details and transition systems must be carefully designed, and an appropriate maintenance regime must be established. In addition several recommendations are made with regard to the use of timber waybeams and transition systems.