Verification of Longitudinal Level Irregularity Suppression Effect at the Structural Boundary by Ballasted Ladder Track

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Numerical experiments were conducted using a three-dimensional numerical analysis model to quantify load dispersion performance of ladder sleepers at line structural boundary. As a result, it was revealed that compared with conventional prestressed concrete sleepers, the ladder sleeper can reduce the pressure on the sleeper bottom plane by approximately 70 %. Furthermore, when laying the ladder sleeper at the structural boundary, it was shown that laying across the structural boundary may be more effective in reducing the pressure on the sleeper bottom plane than laying it in front of the structural boundary. Finally, the ladder sleepers were installed on commercial line to verify the effect in suppressing longitudinal level irregularity.