

## LOADING TESTS ON STANDARD F27 SLEEPERS AND RE-DESIGNED SLEEPERS WITH PARTICULAR EMPHASIS ON REVERSE BENDING STRENGTH AT THE RAIL SEATINGS

A number of standard F27 concrete sleepers have cracked or failed in service due to cracks commencing from the top of the sleeper near the position of the cast-in Pandrol shoulders.

The sleeper was designed to withstand high sagging moments at the seat section but not hogging moments, thus the pre-stress at the soffit was high and the pre-stress at the top of the seat section was small.

As hogging moments at the rail seat can occur under adverse loading conditions, an increase in the prestress at the top of the rail seat section should assist in reducing such cracks and failures.

Sleeper designs have been prepared in which the pre-stress at the top of the rail seat areas has been increased considerably, and castings of such sleepers viz. Dow-Mac D912 and Costain F27A have been subjected to laboratory loading tests.

Static and dynamic tests have demonstrated that the expected increase in 'reverse' bending strength at the rail seats was achieved.