

Title: Assessment of structural adequacy of RDSO's standard plate girder of 12.2m constructed Bridge No. 248 and recommendations for retrofitting of superstructure of bridges (if any), ECR Mahendrughat (SSP 431)

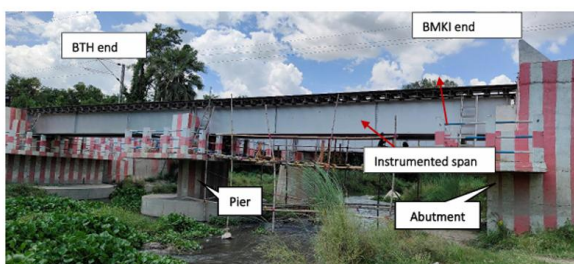
Client : *East Central Railways (ECR)*

Bridge No. BR248, a two-span steel plate girder railway bridge under East Central Railway (ECR), exhibited deflections exceeding the limits prescribed in railway design standards during inspections. CSIR-SERC was entrusted to investigate the structural behaviour, assess the bridge's adequacy for present and future loading conditions, and recommend remedial measures if required. The project involved detailed field instrumentation, static and dynamic load testing, data analysis, finite element modelling, and train-bridge interaction simulations to evaluate the bridge performance under operational and proposed 25-ton axle loads.

The challenge here is to measure the strain, deflection, and acceleration responses under moving train loads through comprehensive field instrumentation and also to develop a high-fidelity numerical model incorporating track-bridge interaction and wheel-rail contact since higher axle loads and train speeds could not be tested directly in the field

Benefits to Client:

Comprehensive field investigations and numerical analysis confirmed that the bridge superstructure was functioning satisfactorily and remained within permissible deflection limits under operational loading conditions. The validated finite element model demonstrated that the bridge could safely accommodate the proposed 25-ton axle loading, with maximum predicted deflections remaining below allowable limits.



General view of the bridge BR248



Test train formation used for static and dynamic testing of the bridge