

ABSTRACT

(Er. R. K. Mallik)

Nonlinear Response of Coupled Joint of Rapti Bridge

This research paper is about the Response of “Coupled Joint of Steel Truss Bridge” that was failed by buckling of Gusset Plate prior to its rectification.

As per the literature, bolting and welding can be applied for the slip critical joint. In case of snug tightened bolted joint, welding can be applied after bolting connection carries some load for which it is in under stressed condition.

Rapti Bridge was also initially built of bolted connection up to Dead Load Limit and then welding was done as a stage construction. The classical approach was first used to identify the causes of buckling failure followed by the Finite Element Method to develop four models of small pieces of a joint to evaluate the response of stage constructed coupled connection.

Effects of Geometric as well as Material Nonlinearity and contact between the bolts and bolt holes were considered to obtain the stress distribution in the vicinity of the bolted and welded connections; at dead and live loads respectively. The stress distribution thus obtained was then evaluated to draw several realistic conclusions.