EXPERIMENTAL INVESTIGATION FOR STRENGTHENING SLENDER WEBS IN SHEAR PANELS OF PLATE GIRDERS WITH (CFRP) PLATES

Haitham H. Muteb^{1*} Mazin A. Al-Mazini ²

¹College of Engineering, University of Babylon

²College of Engineering, Basra University

ABSTRACT

The strengthening of shear panels of plate girder with CFRP plate investigated in this research. The research is an experimental investigation of plate girders strengthened by using CFRP plate attached in shear panels on both side of the web. This work includes testing of fourteen plate girder specimens under four-point loads. Four specimens were tested to study the influence of the amount of the CFRP plate. Three of them were strengthened, while the last one was tested without strengthening and it acts as a reference specimen. The effect of the orientation of CFRP plate was also investigated by testing four specimens strengthened by different orientation of CFRP plate and compared with reference specimen used in group one of the specimens. These specimens had the same dimensions. The experimental results show that the major effect of the CFRP plates is to enhance the stability of the plate girder. The CFRP plate increases significantly the buckling load through the contribution of the CFRP to delay the buckling of the web of the plate girder. This increase was about 92%. Also, it is found that the strengthening of the plate girder by using CFRP will increase the ultimate load by about 55%.

Keywords: steel, plate girders, shear panel, strengthening, experimental work, CFRP plates.