ABSTRACT

*In the design of plate girders, the best approach is to put the material as far from the neutral axis as possible and keep the web area as small as possible. This approach maximized the section’s efficiency for strength. As a result of this principle, Plate girders used in bridges are usually deep beams with relatively thin webs and,* *subsequently, web buckling becomes an important factor to consider during their design. When* *the limit state of web buckling governs the design, transverse and longitudinal stiffeners may be* *used to increase section strength. Therefore; an Optimum location of longitudinal stiffeners in plate girders under high shear low moment near support were investigated in this study.*

*This study explores simple span, plate girders with yield stresses of 240Mpa for flange and 280MPa of web and investigates optimal horizontal single stiffener location. Parametric studies are conducted for a range of slenderness ratio, aspect ratio and relative location of longitudinal stiffener with the web using ABAQUS, and sections are examined under where high shear-low moment conditions near supports. The girders studied were divided into three groups. Each group is composed of seven girders.*

*A model for each combination of parameters is built, and seven cases are analyzed. In the first group, the second group and the third group the percentage increased the value of Pcr at 0.5D location of the longitudinal stiffener is 173%, 128%, and 162% respectively of a plate girder without longitudinal stiffener. Recommendations are proposed for the location of a longitudinal stiffener for this case, 0.5D. Therefore, in high shear-low moment conditions, longitudinal stiffeners can be used to increase girder strength to resist shear by placing it at the mid-depth of the web. The contribution of a web longitudinal stiffener to increase the strength of the plate girder depends upon the aspect ratio. For a plate girder aspect ratio value of (a/D) 1 and 2 units, the contribution of longitudinal stiffener placed at the optimal location is 2.5 and 2 times a plate girder without longitudinal stiffener respectively.*

***Keywords****: Buckling load, local buckling, longitudinal web stiffener, plate girder, Abacus.*