World Academy of Science, Engineering and Technology
International Journal of Structural and Construction Engineering
Vol:10, No:09, 2016

# Study on Buckling and Yielding Behaviors of Low Yield Point Steel Plates

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**Abstract :** Stability and performance of steel plates are characterized by geometrical buckling and material yielding. In this paper, the geometrical buckling and material yielding behaviors of low yield point (LYP) steel plates are studied from the point of view of their application in steel plate shear wall (SPSW) systems. Use of LYP steel facilitates the design and application of web plates with improved buckling and energy absorption capacities in SPSW systems. LYP steel infill plates may yield first and then undergo inelastic buckling. Hence, accurate determination of the limiting plate thickness corresponding to simultaneous buckling and yielding can be effective in seismic design of such lateral force-resisting and energy dissipating systems. The limiting thicknesses of plates with different loading and support conditions are determined theoretically and verified through detailed numerical simulations. Effects of use of LYP steel and plate aspect ratio parameter on the limiting plate thickness are investigated as well. In addition, detailed studies are performed on determination of the limiting web-plate thickness in code-designed SPSWs. Some practical recommendations are accordingly provided for efficient seismic design of SPSW systems with LYP steel infill plates.

**Keywords :** buckling, low yield point steel, plates, steel plate shear walls, yielding
**Conference Title :** ICSECM 2016 : International Conference on Structural Engineering and Construction Management
**Conference Location :** San Francisco, United States
**Conference Dates :** September 26-27, 2016