

## *Evaluation of Performance and Optimization of Composite Shear Wall*

Alireza Rahai ; Farzad Hatami ; Mohammadreza Salami

### **ABSTRACT**

Steel plate shear walls have been used in structures as a lateral load resisting system since 1970. Main advantage of thin steel plate shear wall is buckling of steel plate under tension field action. Generally, there are two methods to delay the steel plate buckling, using stiffeners or concrete cover which attached to the steel plate by shear connectors.

In the present study, a numerical approach has been used to investigate the shear behavior of composite shear walls under lateral loading. Furthermore a geometrical optimization analysis was carried out by changing the concrete cover thickness and distance between shear connectors. The results of numerical analysis, show increasing concrete cover thickness will result decreasing stress concentration in steel plate and distributing them. Furthermore the result show that decreasing distance between shear connector will result increasing the strength and stiffness of shear panel. Finally studying the models deformation the optimum concrete cover thickness and distance between shear connectors are proposed.

### **KEYWORDS**

Steel plate shear wall, Composite shear wall, Buckling, Post- buckling, Shear connector

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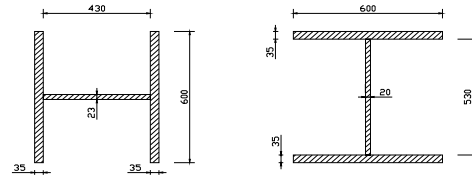
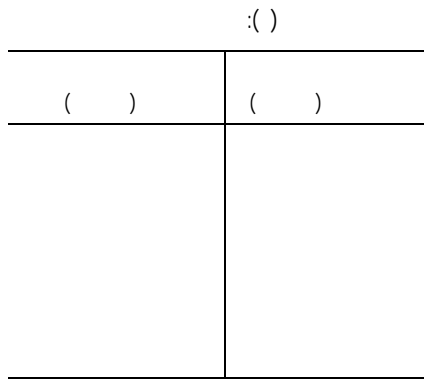
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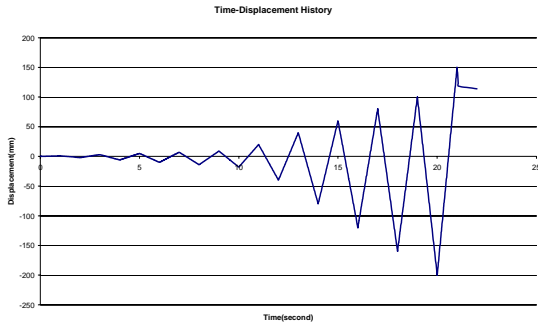
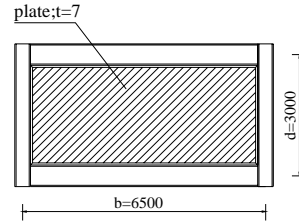
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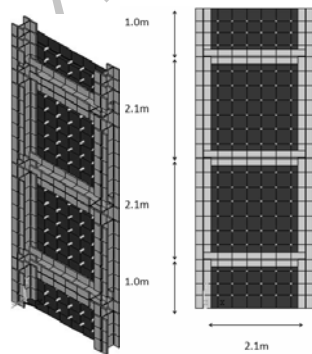


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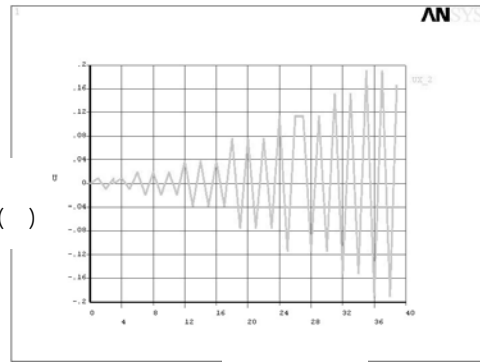
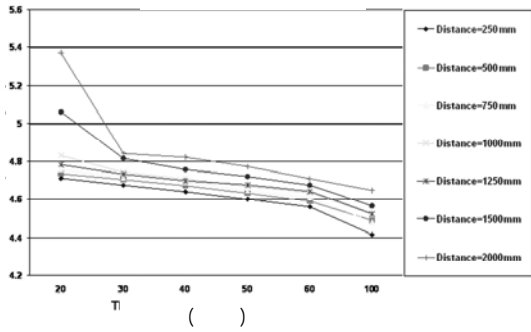
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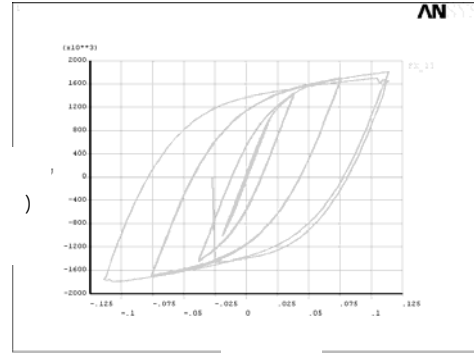


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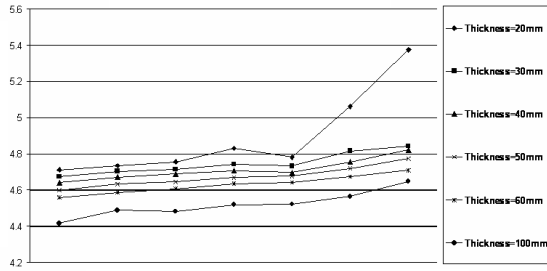
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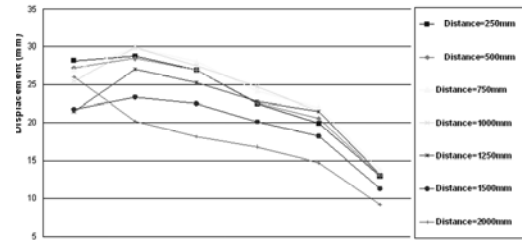
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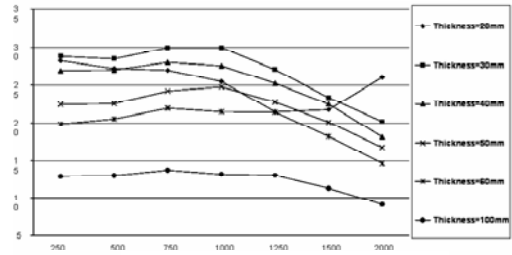
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- <sup>1</sup> . Diagonal tension field
  - <sup>2</sup> Drift
  - 3 Von Misses yield criterion
  - 4 Monotonic
  - 5 Cyclic
  - 6 “Low – yield”