

Effect of Confinement Schemes on In-plane Behavior of URM Walls

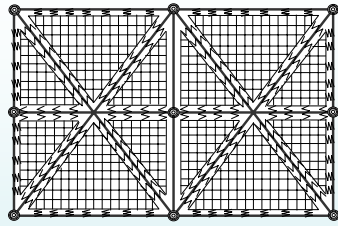


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Analytical Modeling

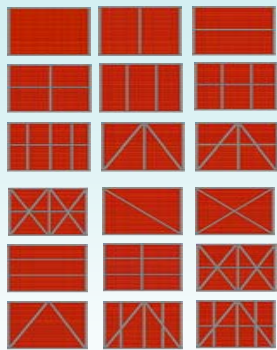
FE Discretization



Mixture of different elements:

- Two dimensional plane-stress continuum for masonry.
- Two dimensional linear elements for confinement.
- Frictional contact elements
- Joint elements

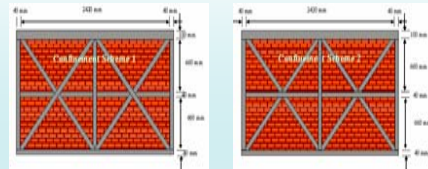
Different Confinement Schemes



Confinement Factor (i/t) is ratio of total length of internal grid elements (i) divided by total length of boundary confining elements (t).

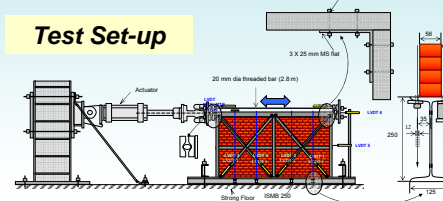
Experimental Investigation

Geometry and Details of Specimen

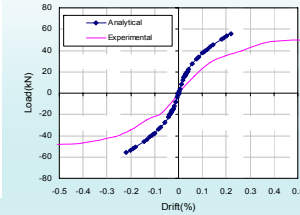
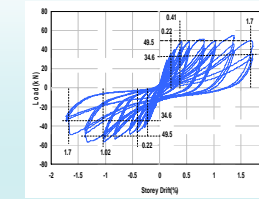


Half-scaled model, Dimension: 2.5 m x 1.5 m

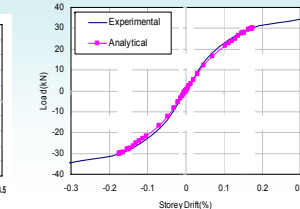
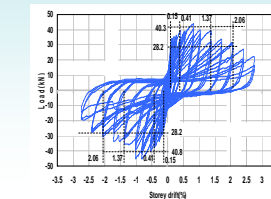
Test Set-up



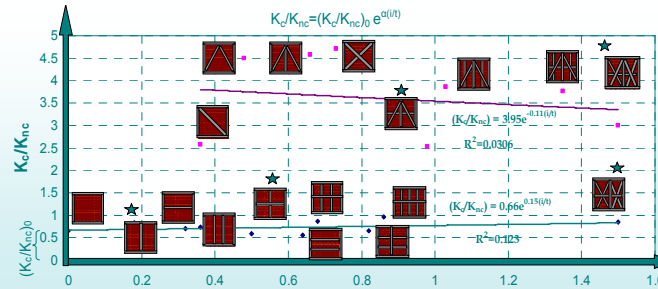
Specimen 1



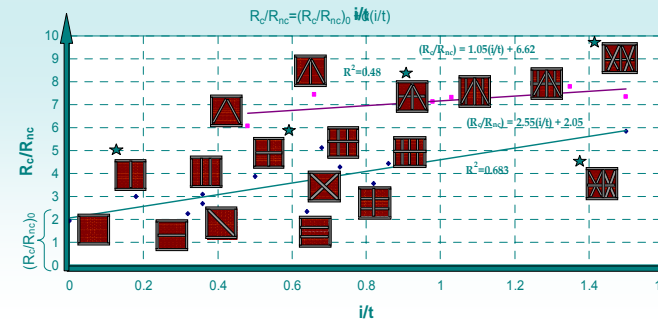
Specimen 2



Stiffness



Strength



Conclusions

- Confining elements distribute crack and result in lesser damage to masonry panel.
- Confinement is more effective in increasing strength of the wall than its stiffness.
- Diagonal members increase strength, stiffness & ductility. Breaking diagonals into discontinuous members reduces strength and stiffness.
- Schemes having single or cross-diagonals exhibit lower strength and higher stiffness.
- Horizontal members introduce preferential plane for sliding and hence reduce the effect of confinement on stiffness and load carrying capacity.
- Horizontal members increase flexibility and overall deformability.

Acknowledgement

The Ministry of Human Resource Development of Government of India, New Delhi provided funds for the research.