

Cyclic Behavior of Joint Reinforced Concrete Masonry Walls

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Abstract:

Wire bed joint reinforcement has been widely used over the years for control of cracks due to temperature and shrinkage, for continuity in multiple wythe wall and to satisfy arbitrary minimum code requirements in the horizontal direction. However, the structural significance of joint reinforcement in block masonry walls, particularly in seismic areas, is not well established. This paper presents an experimental study of the behavior of horizontally spanning joints reinforced block masonry walls under quasi-static cyclic out-of-plane lateral loading. Five wall panels with three different amounts of horizontal steel were tested to determine the wall hysteretic characteristics including the stability of the loops, the extent of post-peak deflection and displacement ductility. Test parameters were: amount of steel, bond type (running the stack bond), and extent of grouting (fully and partially grouted). The test results show that the percentage of steel affects wall cracking, strength and ductility. The post-peak behavior of the walls was governed by the rupture of the reinforcement. It is concluded that, due to its brittle characteristics, galvanized cold drawn joint reinforcement is limited in its ability to provide a desirable ductile behavior of masonry walls subjected to out-of-plane bending.

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