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往复荷载下高强砖组合墙体承载力与变形研究

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摘要: 对一种新型高强度烧结砖组合墙体的承载能力与变形能力进行了研究. 针对传统组合墙体砌块材料强度较低且墙体高宽比较小的情况, 采用新型高强度的烧结页岩粉煤灰砖做材料, 设计了高宽比分别为1.4和2.3的2组试件, 研究了高宽比、竖向压应力以及纵向和水平配筋率等因素对墙体抗侧力和延性的影响. 7片墙体的低周反复荷载试验结果表明: 在其他参数相同的条件下, 高宽比较大的墙体, 其抗侧承载力明显低于高宽比较小的墙体, 但是其延性明显要好. 对2种墙体在低周反复荷载和单向静力荷载作用下的承载能力与延性进行对比, 结果表明: 在低周反复荷载作用下, 配筋率越低的墙体延性越好; 相反, 在单向静力荷载作用下, 提高墙体约束柱的配筋率, 在一定范围内可以增加墙体的延性; 这种墙体具有较高的抗侧能力和良好的变形能力, 具有较高的实用价值.

关键字: 高宽比; 高强砖; 组合墙体; 低周反复荷载; 配筋率

Experimental research on the lateral resistant capacity and the capacity of deformation of composite walls made of bricks with higher compressive strength under low-cyclic loading

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Abstract: Researches were made on the seismic resistant capacity of lateral loading and the ductility of a new composite wall made of sintered shale-favinosecoal bricks with higher compressive strength in this paper. Compared to traditional composite walls made of lower compressive strength bricks with lower ratio of rise to span, we designed two series of composite walls with ratio of rise to span of 1.4 and 2.3, which were made of sintered shale-favinosecoal bricks with higher compressive strength. Investigations were made on the resistant capacity of lateral loading and the ductility of walls after a detailed analysis of all kinds of effects, such as axial compressive strain, the ratio of rise to span, ratio of reinforcement. By the test of seven composite walls under low-cyclic loading, the results indicated that the resistant capacity of lateral loading of walls with higher ratio of rise to span was lower than that of walls with lower ratio of rise to span if the other parameters were the same. However, its ductility was better. By contrasting the ductility and the resistant capacity of lateral loading between the walls under low-cyclic loading and under unidirectional lateral static loading, we could draw the conclusion that the ductility of walls with lower ratio of reinforcement was better than that with higher ratio of reinforcement under low-cyclic loading. On the other hand, the ductility of walls could be improved to a certain extent while you increased the ratio of reinforcement under unidirectional lateral static loading. The results of experiments indicate that this kind of

composite wall made of these bricks have the advantages of higher resistant capacity of lateral loading and superior deformation behavior and have excellent use value and good prospects.

Key words:ratio of rise to span; higher compressive strength bricks; composite wall; low-cyclic loading ratio of reinforcement; ratio of reinforcement

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