# BEHAVIOUR OF JOINTS IN PREFABRICATED SHEAR WALLS FOR SEISMIC ZONES

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In the report on the "Response of Buildings to Lateral Forces" the ACI committee 442 favours cast-in-place construction because of its strength, stiffness and ductility. It has also been shown (2) that shear walls can be designed and detailed to achieve sufficient ductility. However, the structural response of the prefabricated shear wall is dominated by the behaviour of semi-rigid joints between wall panels.

In this paper an analysis, taking into account the stepwise plastification of vertical joints between the prefabricates of the shear wall, is presented. This enables a study of the ductility demand of the joints for an overall ductility factor. When the magnitude of shear forces caused by the lateral loads induces plastic deformation, the analysis was based on the assumption of a semi-plastic joint having a plastic hinge length equal to the distance over which the stresses exceeded the yield limit.

Results of tests (1) on joint models subjected to reversed static cyclic loading to simulate the conditions that would exist at a vertical joint of a proto type prefab shear wall is reported. In these models, transverse reinforcements were welded in the joint region for effecting the shear transfer across the vertical joint. In particular, the problems of brittle and ductile failures, alternating plasticity, sliding shear, stiffness degradation and strength loss of the shear-key reinforced joints were observed.The investigation revealed that the stiffness reduction of the joint because of diagonal cracking could be as high as 65 to 70%. This reduces the efficiency of the lateral load resisting shear wall system which changes from a homogeneous cantilever when uncracked to a scheme of multi-cantilevers with elasto-plastic joints having only 30% of the stiffness of the original joint.

## Bibliography

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