



## Structural Performance of Steel Concrete Composite Columns of Non-Symmetric Cross Section

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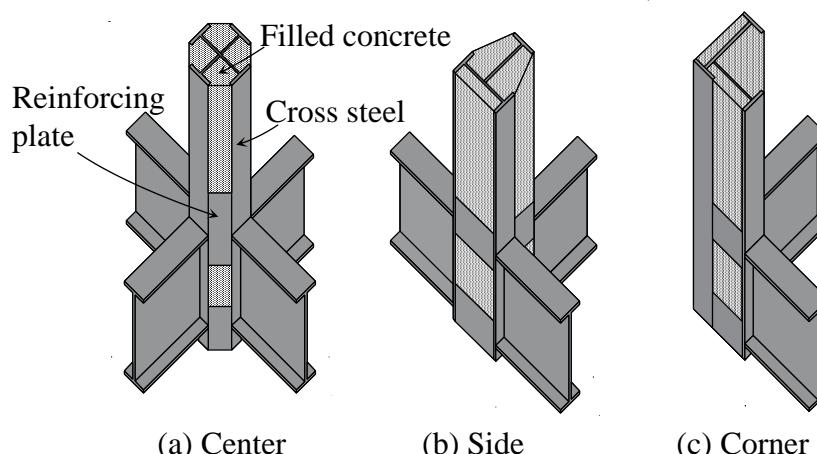
### Summary

We confirmed the mechanical behavior of steel-concrete composite columns with symmetrical and unsymmetrical cross section through the structural tests under the constant axial force and the cyclic lateral force. The experimental parameters were as follows, axial force level and shapes of cross section. The structural tests make it clear that ultimate strength can be evaluated to superposed strength method, in which the ultimate strength of the steel section and the concrete section. However, in the case of steel-concrete composite columns with unsymmetrical cross section under the high axial compression, it was found from the tests result that ductility after the attainment of the maximum strength was small.

**Keywords:** steel-concrete composite structures; unsymmetrical cross section; ultimate flexural strength; superposed strength; deformation capacity.

### 1. Introduction

Steel-concrete composite structure possesses the properties of both steel and concrete, and by appropriate design it is possible to provide good earthquake resistance in such structures. High-rise buildings of steel-concrete composite construction showed good earthquake-resistant capacity under the Kanto earthquake (1923) as compared with ordinary reinforced concrete structures. Since then the encased structural system, a form of steel-concrete composite construction, steel reinforced concrete structure has been employed in Japan for most building frames higher than seven stories. However, from the situation of a recent construction cost, the demand



*Fig. 1: Steel-concrete composite column*