

Connection between tubular composite columns and concrete slab

The core of this invention is to present a steel mounting part, which enables a fully rigid connectivity between tubular composite column and reinforced concrete slab. Simultaneously, it solves punching shear problems in the reinforced concrete slab by increasing its shear capacity.

BACKGROUND

In the design of buildings for economic and architectural reasons, great effort is being made to increase the span of the columns and reduce the weight of the structures. The use of hollow concrete-filled steel tubular composite sections allows higher bearing capacity, produces slender compatible lines, and can achieve a constant external column dimension throughout the full height of the building.

One of the main challenges is the connectivity between composite column and concrete slab. The state of art of connection concentrates mainly on solving the punching shear problem. The absence of a rigid connectivity leads to an increase in the dimensions of the other bearing elements under asymmetrical vertical and horizontal loading.

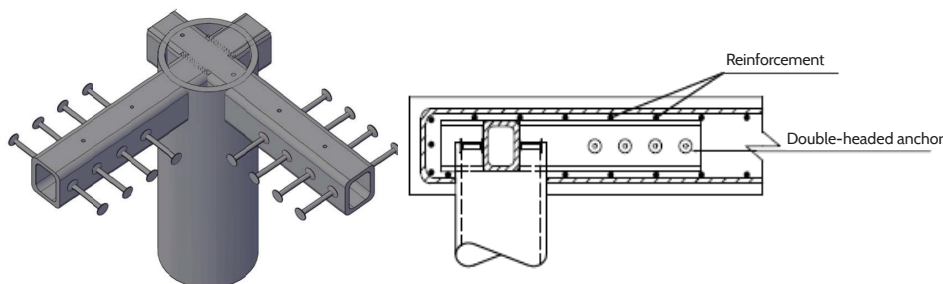


Fig. 1: Corner column

TECHNOLOGY

The steel mounting part composed of steel hollow profile and/or plates, arranged perpendicular to each other, is horizontally inserted through the tubular composite column. To ensure a force-locked connection between the steel mounting part and concrete, double-headed anchors, headed studs and any other kind of shear connectors can be used on each arm of steel mounting part.

BENEFITS

- High rigidity against horizontal loads like earthquake and wind.
- Possibility to use slimmer concrete slab, which reduces the height and the weight of the structure, respectively reducing material used in the structure.
- Increasing the span length.
- Easy to design for structural engineers.
- Easy to manufacture and rapid execution.
- Suitable also for the connection between composite columns and concrete foundation.

REFERENCE:
M024/14

AVAILABLE FOR:
License Agreement

**KEYWORDS/
APPLICATION:**
Tubular composite column,
Reinforced concrete slab,
Steel mounting part,
Shear head

DEVELOPMENT STATUS:
Tested Lab prototype

IPR:
Patent AT 516264 granted,
PCT filed

INVENTORS:
A. Tootoonchi, A. Kolbitsch

CONTACT:

Karin Hofmann

TU Wien
Research & Transfer Support
Favoritenstrasse 16/E0154
1040 Vienna, Austria
T: +43 1 58801-415241
karin.hofmann@tuwien.ac.at
www.rt.tuwien.ac.at