



Xiong'an Railway Station: A Supersized Railway Station in High Seismic Intensity Zone

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Abstract

Xiong'an Railway Station is the super-large elevated railway station located in the high seismic intensity zone. The reinforced concrete frame structural system is adopted for the rail-bearing floor and the lower floors, while the steel structural system is adopted for the large span roof. H-shaped steel frame beams are adopted for the elevated waiting hall, while double flange H-shaped steel beams are adopted in the area of great forces. Plane trusses are arranged bi-directionally between the frame beams to facilitate the laying and maintenance of equipment pipelines. The main span of the elevated waiting hall is 78m, and the variable-height box beams are adopted. The platform canopies are supported by special shaped steel pipe columns, and the roof frame beams are connected to the top of columns through spherical bearings. Structural innovations have been carried out in terms of semi-embedded column bases, stepped wall thickness steel pipe columns with special section shape, large-span stiffened thin-walled box beams, and bi-direction large displacement bearings.

Keywords: high speed railway; railway station; SRC Frame; large span steel structure.

1 Main structure

The rail-bearing floor is 606m long from north to south and 307.5m long from east to west. The main structure below rails adopts the reinforced concrete frame structure system, the standard column grid size of railway station is 20~23m × 24m, and the maximum column spacing along the rail direction is 30m. SRC columns with cross-section size of 2.7m×2.7m are adopted in order to improve the seismic performance of the rail-bearing floor. The SRC beams are adopted for the frame and rail bearing beams, the cross-section size of rail bearing beams along the rail direction is

1200mm×2400mm, and the cross-section size of rail bearing beams perpendicular to the rail direction is 1400mm×3000mm.



Fig.1 Xiong'an Railway Station