



The Chaotianmen Bridge—An arch bridge with a new world record span of 552 m

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Summary

The Chongqing Chaotianmen Yangtse River Bridge is a steel truss arch bridge with a main span of 552 m. The main span of the bridge is currently the world's longest. Its design and construction overcame significant technical difficulties. This paper describes the innovative aspects of the bridge with regard to selection of structural system, length of main span, and construction technology.

Keywords: Steel truss arch bridge, Yangtse River Bridge, world record, design innovations

1. Introduction

The Chongqing Chaotianmen Yangtse river bridge was opened to traffic in May 2009.

The superstructure of the Chantianmen Bridge is a double-deck, three span continuous deck-through truss tied-arch system. The upper deck, 36 m in width, carries six lanes of highway traffic and sidewalks on both sides. The lower deck carries two tracks of light rail, arranged on either side of centreline of bridge, plus two 7 m wide highway decks, one on each side of the railway tracks.

The transverse spacing between the two arch ribs is 29 m. The height from the middle support to the top of arch is 142 m. The profile of the lower chord of the main span and of the central portion of the upper chord are defined by parabolic curves. A reverse circular curve is used for the profile of the upper chord as it transitions from the main span to the side spans. The height from deck to top of arch is 128m and the depth to span ratio is 1/4. 31.

Steel of grades Q420qD and Q370qD is used as the material of main truss. Grade Q345qD steel is used in deck system and bracing members. Grade 16Mn(Q345) steel is used in rolled sections. Maximum plate thickness 40mm in truss members and 80 mm in gusset plates. The longest member is 41 m long and the heaviest member weighs 81 t.