



Deck structure under assembling.

The Siduhe Bridge

– world's highest bridge built in China

In China, a high bridge by name the Siduhe Bridge was opened to traffic in November 2009. It is a suspension bridge, span 900 m, vertical clearance 472 m, highest in the world [1-2]. A month later in December 2009, another high suspension bridge was opened to traffic in China. It is the Balinghe Bridge, span 1088 m, vertical clearance 370 m [3].

The Siduhe Bridge is situated at Yesan-guanzhen, Hubei Province, China, some 80 km south of the famous Three Gorge Dam. The bridge was built across the Siduhe River at a height of 472 m, and it belongs to the

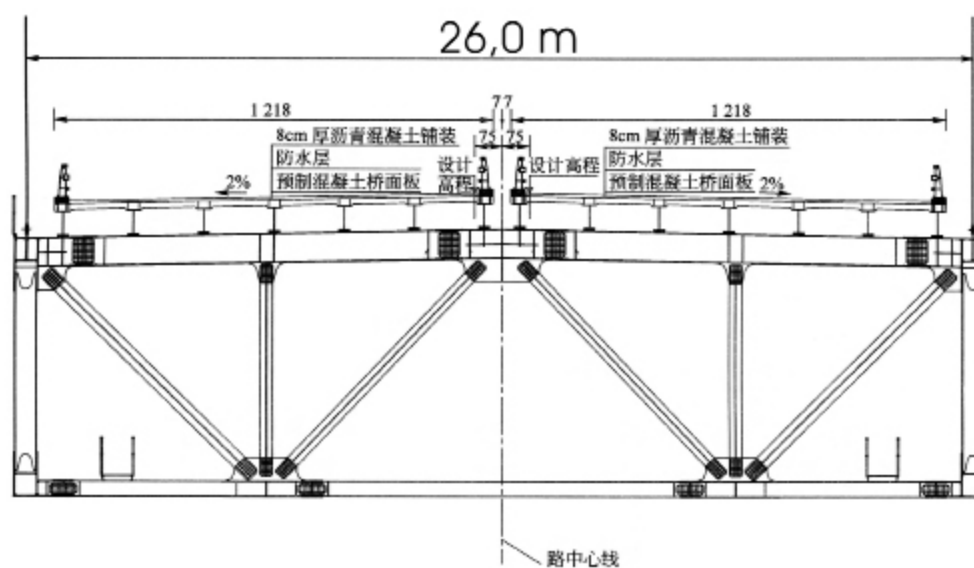
West Hurong Highway between Shanghai in the east coast and Chongqing and Chengdu in the west. Along this highway, there are also some other notable bridges [1].

The main span of the Siduhe Bridge is 900

m, and only it is supported by hangers from the overhead main cables, not the two side spans. The shorter side span from tower to anchorage is 114 m, and the roadway continues in a tunnel. The opposite side span is



General view of the Siduhe Bridge.



Cross-section of the deck.

208 m, and it is supported by underneath columns. The total length of the 3-span bridge is 1222 m.

The both concrete towers are H-shaped seen transversely along the bridge align-

ment. The legs of each tower are connected by three concrete cross-beams, one at the tower top, another under the deck level, and the third one between these two levels. The tower near the shorter side span is 118 m

tall, the opposite tower 122 m.

The pilot rope for main cables was carried by a rocket, which was fired across the gorge in October 2006. The bridge has two main cables and these both consist of prefabricat-

ed parallel wire strands (PPWS). Each main cable contains 127 strands, and each strand also contains 127 high-strength Ø 5,1 mm parallel steel wires. Thus in each main cable the total number of steel wires is 16'129 [4]. The prefabricated strands were hauled to their position between anchorages over the tower tops, and each main cable was then compressed to a circular shape.

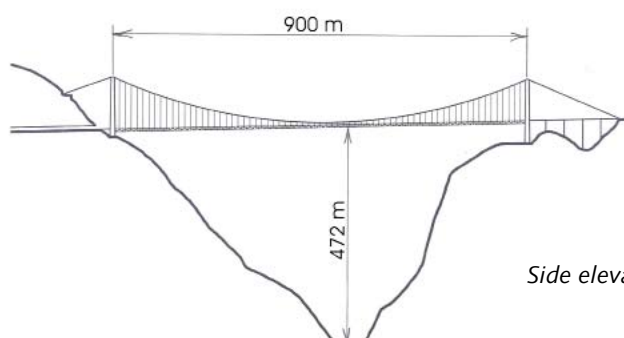
Like the Balinghe Bridge also the deck of the Siduhe Bridge consists of a steel truss girder structure, and its measures 26,0 x 6,5 m [4]. The bridge accommodates two road-

ways, each containing two traffic lanes and a maintenance lane. The roadway slopes downward towards the shorter side span at a gradient of 2,4 %.

The Consultant of the Siduhe Bridge is CSHCC Second Highway Consultants Company Ltd. The bridge was opened to traffic on 15th November 2009, the cost being 720 million yuans (CNY) or about 100 million dollars (USD) [4].

Author: Juhani Virola

Illustration: Eric Sakowski



Side elevation of the bridge.



Towers and main cables already completed, hangers under assembling.

The five highest bridges in the world, [1]

No	Bridge (span)	Height	Location	Year
1	Siduhe (900 m)	472 m (1)	Yesanguanzhen, China	2009
2	Hegigio (470 m)	393 m (2)	Otoma, Papua New Guinea	2005
3	Baluarte (520 m)	390 m (3)	El Palmito, Mexico	2012
4	Balinghe (1088 m)	370 m (1)	Guanling, China	2009
5	Beipanjiang (388 m)	366 m (1)	Xingbeizhen, China	2003

Bridge type:

(1) suspension bridge, (2) pipe suspension bridge, (3) cable-stayed bridge.

In the Table, the term Height = vertical clearance of the bridge = distance between bridge deck and river surface or gorge bottom.

In the Table, there is included also a bridge in Papua New Guinea. It is a pipeline suspension bridge, built across the Hegigio River for gas and oil pipelines, and which bridge is not widely known elsewhere.



Finnish summary:

Kiinassa valmistui marraskuussa 2009 Siduhe Bridge niminen riippusilta, jonka jänneväli on 900 m. Sillan vapaa korkeus eli siltakannen ja joenpinnan välinen etäisyys on 472 m, mikä on korkein maailmassa [1-2]. Kuukautta myöhemmin joulukuussa 2009 valmistui Kiinassa samantyyppinen Balinghen riippusilta (jv. 1088 m, kork. 370 m) [3].

References:

[1] Information and illustration kindly given by Eric Sakowski, www.highestbridges.com

[2] Helena Russell: "Aiming high". Bridge Design & Engineering 2010:1, p. 33-34.

[3] Juhani Virola: "The Balinghe Bridge – world's highest bridge". Rakennusinsinööri ja -arkkitehti RIA 2009:2, p. 57-59.

[4] Eugenio A. Merzagora: "Siduhe Bridge: Un nuovo record mondiale". Strade & Autostrade 2010:2, p. 2-7.