Zeitschrift: IABSE reports = Rapports AIPC = IVBH Berichte
Band: 82 (1999)

Artikel: Retrospect & Prospect of cable-stayed bridges in China
Autor: Xiang, Haifan
DOI: https://doi.org/10.5169/seals-62099

Retrospect & Prospect of Cable-Stayed Bridges in China

Haifan XIANG
Tongji University
Shanghai
China

Haifan Xiang, born 1935, finished his postgraduate study in civil engineering at Tongji University in 1958

Abstract

The construction of modern cable-stayed bridges in China initiated in 1972, relatively later compared with other developed countries, but in last two decades of this century, a number of cable-stayed bridges have been built, the span length from 54m of the first bridge has been increased beyond 600m, about 9 cable-stayed bridges with spans over 400m have been opened to traffic, and 3 with spans over 600 m are now under construction. Table 1 shows the main cable-stayed bridges in China with spans over 400m.

	Bridge Name	Location	Main Span	Year of Completion	Deck Type
1	Nanpu Bridge	Shanghai	423 m	1991	composite
2	Yangpu Bridge	Shanghai	602 m	1994	composite
3	Yunxian Bridge / Han River	Hubei	414 m	1994	P.C.
4	2nd Wuhan Bridge / Yangtse River	Hubei	400 m	1995	P.C.
5	Tongling Bridge / Yangtse River	Anhui	436 m	1995	P.C.
6	2nd Chongqing Bridge / Yangtse R.	Chongqing	444 m	1995	P.C.
7	Xupu Bridge	Shanghai	590 m	1996	composite
8	Kap Shui Mun Bridge	Hong Kong	430 m	1997	steel
9	Ting Kau Bridge	Hong Kong	475 m	1998	composite
10	2nd Santou Bay Bridge	Guangdong	518 m	u.c. (1999)	mixed
11	2nd Nanjing Bridge / Yangtse River	Jiangsu Prov.	628 m	u.c. (2001)	steel
12	3rd Wuhan Bridge / Yangtse River	Hubei Prov.	618 m	u.c.(2002)	mixed
13	Jingsha Bridge / Yangtse River	Hubei Prov.	500 m	u.c. (2002)	P.C.
14	Qingzhoulu Bridge	Fujian Prov.	605 m	u.c.	composite
15	Zhanjiang Bay Bridge	Guangdong	480 m	u.c.	P. C.
16	Lingdingyang West Channel	Guangdong	950 m	u.p.	steel
17	Chongming Bridge	Shanghai	1200 m	u.p.	steel
18	Zhenyang Bridge	Jiangsu	625 m	u.p.	steel

Table 1. Major Cable-stayed Bridges in China (L > 400 m)

During the progress of building these large cable-stayed bridges, the Chinese bridge engineers and researchers obtained experiences in the design and construction techniques and furthermore gathered more scientific results related to the topics of structural details, earthquake-resistant and wind-resistant design as well as construction control. In this paper, the state of art including some innovative points, for example, general structural systems, stay cable technology and the construction control technique considering creep effects for P. C. cable-stayed bridges will be introduced.

Most of large cable-stayed bridges have been or will be built along the pacific coast of China, the most economic developed region in China. As the coastal line is often hit by typhoons, the wind-induced problems play an important role in designing these large bridges. The State Key Laboratory for Disaster Reduction in Civil Engineering(SKLDCE) at Tongji University has been charged with their wind-resistant studies, where there are three boundary wind tunnels, in which the largest one has a testing dimension of 15m wide, 2 m high and 14 m long. In this paper some of the activities of the group of bridge aerodynamics especially related to cable-stayed bridges will also be introduced.

As the requirement of several strait crossings in China, the span length of cable-stayed bridges will increase to a new record. A traditional cable-stayed bridge with a span length of 950 m has been proposed by the Bridge Design Institute of Tongji University, which has been selected in the design competition for further optimization. In this paper some of the main conceptual considerations for this bridge will be presented for discussion.

In the first two decades of next century, China will be one of the world's hot places in building cable-stayed bridges. Although Chinese bridge engineers have now confidence to build cable-stayed bridges with longer spans, international colleagues are welcome for co-operation.