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KAO PING HSI BRIDGE (HIGH WAY), TAIWAN, R.O.C.

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1. Introduction

Taiwan's first high way, connecting Taipei with Kaohsiung, had been completed by 1978. Due to the significant increasing motorization, the government was forced to construct a second high way, which has length of 320 km. The part of it has already been in use.

This Project is the construction of "Kao Ping Hsi Bridge", connecting Kaohsiung county to Pingtung county, located approximately 30 km from Kaohsiung city center, and crossing Kao Ping Hsi River.

The width of the river at the construction area is about 2,500m.

The bridge, which length is 2,617m, consists of three types of bridges, a combined cable stay bridge portion of 510m, a portion constructed by Free Cantilever Erection with Cable method (FCC) of 1,020m and a portion constructed by Advance Shoring method of 1,087m. The high way is 34.5m wide, 6 lanes in full scale and has a surface area of 89,942m² over the Bridge.

The two-span combined cable stay bridge consists of A shape concrete pylon of 183.5m high, concrete girder of 180m long and steel girder of 330m long. The 34.5m width cross section has both right and left lanes. The bridge is lifted by stay cable in the center of road.

The high way which includes this bridge will be completed by the end of 1999 and will be in use from the beginning of the 2000.

2. Outline of the Project

Name of the Project:	C381 section, Kao Ping Hsi Bridge Construction, Taiwan Second Highway Project
Place of the Project:	Kaohsiung County and Pingtung County, Taiwan R.O.C.
Client:	Ministry of Transportation and Communications Taiwan area National Expressway Engineering Bureau (TANEEB)
Consultant:	China Engineering Consultants (CECI) Vienna Civil Engineering (Austria VCE)
Contractor:	Taisei Corporation, Kawada Industries Incorporated (Japan) Pan-Asia Corporation, Raito Engineering Corporation (Taiwan)
Contract Amount:	NT\$2,136,000,000 (JPY7.9bil)
Construction Period:	1996/4/29 - 2000/2/19

3. Feature of the Project

- (1) This is one of the biggest combined cable stay bridges as a river-crossing motor high way having 6 lanes in full scale in the world.
- (2) A full section welding structure of the 330m steel girder is rare for this kind of the large scale stay cable bridge.
- (3) The weight at lifting one steel girder unit is about 400t, one of the heaviest weights of this kind of construction.

Keyword: Kao Ping Hsi Bridge, Cable Stay Bridge, Free cantilever method, Advance shoring method, PC Girder
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- (4) A foundation of pylon consists of two RC diaphragm wall foundations (19.0m L x 15.8m W x 40m D) and these are connected by underground beam.
- (5) There is few case in Japan to be contracted to one Joint Venture to carry out this kind of large bridge with various types of construction methods (cable stay bridge, concrete girder by FCC method, and concrete girder by Advance Shoring method).

4. Difficulties in Management

- (1) This project is a big challenge for Taisei Corporation for only six staff to manage the whole project with support of local companies using Project Management System (PMS) originated by Taisei Corp. This PMS assisted to organize and manage the multi-nationality's engineers and workers from Austria, Germany, South Africa, USA, Taiwan, Myanmar, India, Philippines and Thailand.
- (2) The most of local sub-contractors were run away after realizing the difficulties and magnitude of the work in the beginning stage. So we were forced to reorganize to change to the direct management by using Philippine engineers and skilled foremen and Thai workers.
- (3) The various materials such as stay cable, anchorage system, pot bearing and expansion joint etc. were procured from many countries by using Taisei's world wide network to minimize the total costs.
- (4) Austrian consultant were employed in order to carry out structural safely analysis during construction stages. And also the wind tunnel test were carried out in Denmark (DMI) under the condition of the maximum wind velocity of 80m/sec to ensure the safety of cable stay bridge during erection.

Fig-1: Cable Stay Portion of the Bridge

