

# Design of Scour Protection for the SuTong Bridge, P.R. China

The SuTong bridge, to date the Worlds Largest Cable-Stayed Bridge, is going to be constructed in the Yangtze River near the city of Nan-Tong, P.R. China. The majority of pylons and piers are founded in water and result in scouring of the erodible river bed.

## Design Approach

COWI used state-of-the-art methods in the assessment and the design of scour protection for the SuTong bridge with the following tasks:

1. Assessment of Existing Situation
  - a. Bathymetry
  - b. Variation in bathymetry over seasons etc. and long term trends
  - c. River/waterway morphology
  - d. Bed material properties and conditions
  - e. Data on water levels, normal & extreme
  - f. Data on currents and waves
2. Assessment of Future Situation
  - a. Impact of bridge on hydrographic conditions
  - b. Desk study of scour around bridge piers
  - c. Physical modeling of scour
3. Conceptual Design of Scour Protection
4. Detailed Design of Scour Protection



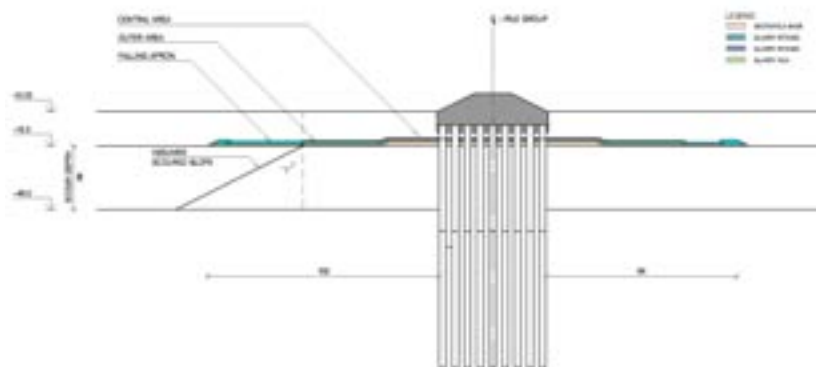
Based on the hydraulic study, geotechnical and structural studies and considering economic feasibility and overall risk, it was recommended to use scour protection for only the two pylons of the main bridge.

## Detailed Design

At the SuTong Bridge, the scour potential is in the order of 30 m for the main pylons if no scour protection is introduced.

The designed scour protection primarily consists of quarry stones and is separated into three areas, Central Area, Outer Area and Falling Apron Area. In the Central Area a temporary protection using large sand bags in approximately 3 layers was placed prior to starting the piling for the foundation of the main pylons. The piling took place through the sand bags. In this way it was possible to establish pre-protection to control scour that would otherwise be very severe when the piles amplify the flow.

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## Services:

- Assessment of hydraulic conditions
- Calculation of scour potential
- Supervision of model tests
- Design of scour protection

Project Period: 2003

Client: JiangSu Province SuTong Bridge Construction Commanding Department, P.R. China

Financing: The Client