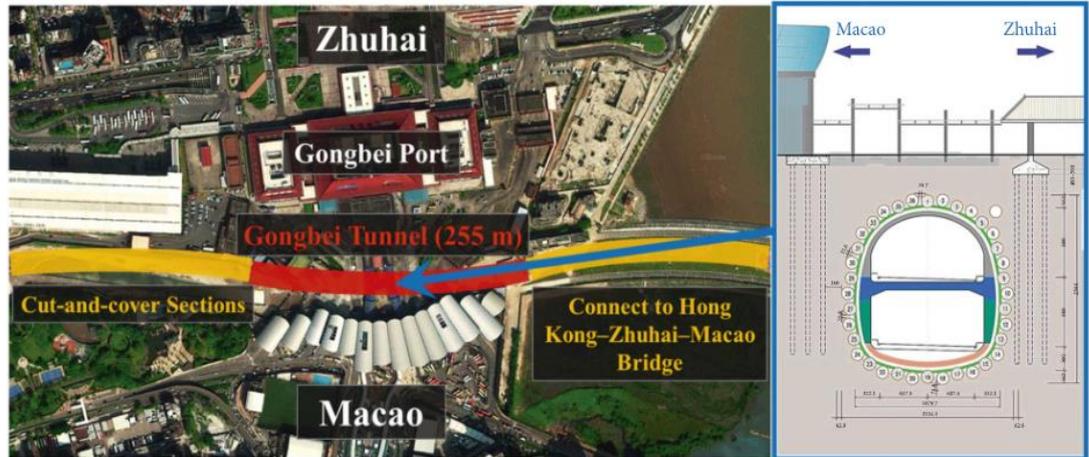


Project identification

# HZMB Zhuhai Link - Gongbei Tunnel Risk Assessment

Type of project

Consultancy



Client

HZMB Zhuhai Link Line Project Office

In co-operation with

not applicable

Project assignment

Risk Assessment and risk control measures for design scheme and construction organisation of 3 alignments with a total of 6 configurations comprising Open-excavation top-down and Sub-surface excavation methods.

Country

PR China

Location

Zhuhai

Project duration

2010

Project phase

Preliminary Design phase

Construction cost

not disclosed  
(excl. VAT)

Consultancy fee

RMB 450,000 (~EUR 45,000)  
(excl. VAT)

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# HZMB Zhuhai Link - Gongbei Tunnel Risk Assessment

Project description

The Hong Kong – Zhuhai – Macau Bridge (HZMB) Fixed Link project provides for a fixed link between the two economic centres Hong Kong and Macau (both of which are Special Administrative Regions within PR China) and the mainland of China at Zhuhai. The whole link, which measures some 50 km in length, has been divided into several major sections. The Zhuhai Link has a length of some 14 km and consists of a bridge that runs from the Zhuhai-Macau BCF island towards the mainland where it converts into a tunnel underneath the Gongbei Border Crossing Facility. It surfaces further to the west to cross the Qian-shan-River and Nan-Wan Road in the form of bridges, and then travels southward as a tunnel through the Nan-Ping Mountain. The final stretch that runs in western direction consists of viaducts with connections to the Heng-Qin North interchange and Hong-Wan interchange.

The Gongbei Border Crossing Facility is one of the busiest facilities of its kind in China, which puts specific challenges to the realisation of a 3-lane dual carriageway underneath it.

Scope of work

TEC has performed a risk assessment including the definition of possible risk control measures for design scheme and construction organization for three different alignments. One alignment considered a single layer tunnel to be realised using the open excavation top-down method, another alignment also considered a single layer tunnel but then to be realised using the subsurface excavation method. The third alignment considered a double layer tunnel that was to be realised using the open excavation method with selected lengths using the subsurface excavation method and applying complex pipe-jacking methodology for the tunnel perimeter combined with freezing techniques for water tightness during the execution of the works.

The Risk Assessment was carried out in compliance with the Chinese "Risk Assessment Guidance for Highway Bridge and Tunnel" (Version for trial) complemented by International accepted Risk Assessment Methodologies. In the assessment, aspects such as project development and implementation, construction conditions, structural concepts, construction technology and operational management were addressed.

Specific issues include:

- Interference with Gongbei BCF operations (health, safety & security)
- Close proximity to BCF facilities
- Unfavourable sub-surface conditions
- Deep construction
- Tunnel Safety
- Risk Management practices in China

