



Temburong Bridge, Brunei

Ground Engineering – Part 1: Engineering Geology

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Abstract

The new 30 km Cadangan Projek Jambatan Temburong (Temburong Bridge Project) in Brunei will provide a highway link between the two separated parts of Brunei, by spanning Brunei Bay. The entire project site is underlain by geologically young, deltaic sandstones and mudstones of the Miocene-aged Belait formation. A thick mantle (>90m in places) of recent, late-Quaternary, superficial deposits blankets the upper undulating erosional surface of the Belait formation within the offshore and swamp areas of the alignment, which comprise about 90% of its length. This paper on the Ground Engineering aspects of the project focuses on the interpretation of the complex ground conditions encountered along the alignment and the various challenges such conditions provided to the design.

Keywords: Brunei, geology; seismic; ground gas; acid sulphate soils; low-strength soils.

1 Introduction

The new 30km Cadangan Projek Jambatan Temburong (Temburong Bridge Project) in Brunei will connect the relatively isolated district of Temburong to the more developed Brunei-Muara district. The various components of the project are described in [1].

Part 1 of this Ground Engineering paper provides an overview of the complex ground conditions encountered along the project alignment and the various challenges these created. Part 2 [2] discusses the geotechnical design approaches adopted to overcome these challenges.

2 Ground Condition Assessment

The assessment was undertaken with reference to all available ground investigation records as well as relevant published information, including geological maps, memoirs, and publications.

2.1 Geological and Tectonic Setting

Borneo is located at the eastern margin of the Sunda Plate (i.e. Sundaland Block) (Figure 1). It is bounded to the east by the Philippine Subduction Zone and Molucca Sea Collision (Sulawesi) Zone; to the south and west by the Indo-Australian Plate. The vast majority of seismicity in Southeast Asia occurs on these plate boundaries and the interior of Sundaland is only affected by a very low rate of shallow seismicity. The nearest major tectonic plate boundary to Brunei lies to the east (Molucca Sea Collision Zone) and is over 750 km away, with most high activity subduction zones (Sumatra, Java and Philippines) being more than 1000km away.

Brunei is located on the NW coast of Borneo within the foreland (north) of an area known as the Rajang-Crocker accretionary complex. The Rajang-Crocker accretionary complex comprises