



The realisation of the 6.2km long Padma Multipurpose Road and Rail Bridge in Bangladesh

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Abstract

The Padma is one of the world's mightiest rivers, being a tributary of the Ganges and the Jamuna rivers, winding its way through Bangladesh to the Bay of Bengal. It is a major division between the country's south-west region and the capital city and economic centre of Dhaka. During the monsoon season, the Padma River becomes fast flowing and capable of causing deep scour. Crossing the Padma with a 6.2km long steel truss bridge, carrying road and rail, presents technical challenges to the client, consultants and contractors, including significant river training work and deep foundations in an alluvial flood plain, where the rock formation lies several km below the river bed, and in an area subject to considerable seismic activity leading to possible liquefaction of the soil. Other challenges include major vessel traffic and ship impact. Once these technical challenges are overcome, the construction of the bridge will bring considerable social, political and economic advantages to Bangladesh and development to the south-west region, giving greater access to the country's second port at Mongla and to the proposed Payra Port, which is currently under construction. This paper describes some of the technical challenges faced and overcome in bringing this landmark multipurpose crossing to fruition.

Keywords: steel-truss bridge; road; rail; river training; ship impact; seismic; scour

1 Historical and Geographical Setting

The driving force and aspiration for the implementation of a fixed crossing of the Padma River is the linkage of the South-West quadrant of Bangladesh to the Eastern Region of the country, and to the capital Dhaka. In meeting this aspiration, the Padma Multipurpose Bridge will link Dhaka to the country's second major port, Mongla, allowing diversity from its current primary dependence on Chittagong port. Khulna,

the third major city of Bangladesh, and Benapole, the 'inland port' will also thereby be linked to the east of the country. It will also form part of the Asian Highway Network.

Geologically Bangladesh primarily comprises the accretion from the littoral drift up the east coast of India together with the sediment flow down from the Himalayas. This results in a country where 90% of the landmass is within 10 metres of sea level, which is subject to annual fluvial flooding, has numerous unstable rivers and,