

Assessment of Scour Levels at the Indus River Bridge Crossing, Pakistan



Upstream irrigation channel weir (left). Artificial island (right) which developed in the early years of operation as a result of excessive siltation at bays 6-10.

As a part of the large Sukkur Bypass Project, the Company was commissioned by the National Highway Authority to perform an independent study of the local hydraulic conditions and the scour levels around the piles of a proposed bridge across the Indus River.

The new bridge crossing is located approx. 150 m downstream of the Sukkur Barrage, which was built during 1923-1932 and designed to accommodate a peak discharge of 42,500 m³/s. The new bridge is a multiple span concrete girder bridge consisting of 36 spans, each span 42.8 m long. The bridge girders are supported by 35 pile groups on 2 m dia. piles, and the total length of the bridge is approx. 1500 m.

Owing to the fact that only a very limited amount of information was available for the analyses, additional information was collected during a site visit to Pakistan.

The combination of extensive theoretical analyses and recent experimental results from the present and similar largescale river projects provided concise information on design scour depths and embedment lengths of the bridge piles, hence leading to a substantial reduction of the required pile lengths.



Execution of confirmatory borings at the bridge piers. A newly constructed pile at the right and the upstream Sukkur Barrage in the background.

Project period: 1997

Client: Government of Pakistan
National Highway Authorities

Financing: The Asian Development
Bank (ADB)