

GUIDE BUND & RIVER PROTECTION WORKS ON RIVER GANGA NEAR ALLAHABAD ALLAHABAD, UTTAR PRADESH, INDIA

Weirs, Culverts and Transverse Structures

Problem

Allahabad bypass project required construction of a bridge over river Ganga. The whole project was funded by the World Bank and assigned to NHAI. The client wanted to protect the bridge from the scouring effects of the flow of the river through the construction of guide bunds and river protection works. The client was looking for a solution which is flexible and permeable in nature and could be economised to a considerable extent. Also, high speed of construction at the site was to be achieved.

Solution

Usually, riprap (pitching) is used for river bank and guide bund protection. Thickness of such riprap vary from 0.3m to 2m as per design. Gabion mattress of lower thickness performs better because of the confinement of stones in the mesh.

It was suggested to provide bank protection with gabion boxes filled with required sized boulders. Gabions of size 4.5mX1.5mX1m, 4.5mX1mX1m, 4.5mX1mX1.5m and 4.5mX1.5mX0.5m were used.

The main advantages for selecting the above solution were:

- 1) Flexibility- Flexibility of system helps the structure to accommodate differential settlement without any compromise in structural integrity.
- 2) Simplicity in construction- The construction of gabions is simple and does not involve deep excavation, dewatering of trenches and erection of formwork.
- 3) Cost-effectiveness- The total cost of gabion solution is less than conventional solutions. Also, minimum foundation is required.
- 4) Permeability- The ability to combine drainage and retention functions makes it an ideal structure. The conventional methods are not able to provide this advantage.
- 5) Eco-friendly- Use of locally available materials makes gabion an eco friendly solution

Client: National Highway Authority of India

Designer / Consultant: LASA & BCEOM

Contractor: Hindustan Construction Company Ltd (HCC)

Products used (Qty.)

- Gabion 11,933 no

Date of construction: 09/2008 - 12/2008



Photo 1: During construction



Photo 2: During construction



Photo 3: During construction