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12. Jalawla Bridge (Iraq)

Owner:	*State Organisation of Road and Bridges, Ministry of Housing and Construction Government of Iraq*
Architect, Engineer, Contractor:	*UP State Bridge Corporation Ltd. Lucknow, India*
Work's duration:	*3 years*
Service date:	*1982*

The construction of the Jalawla Bridge and its approaches was awarded to Indian Road Construction Corporation Ltd. (IRCC), a Government of India Undertaking, by Government of Iraq, Ministry of Housing and Construction, State Organisation of Roads and Bridges, on the basis of a global tender. There were many international firms which had tendered for this project, but Indian Road Construction Corp. bagged this work, for which economical design and low cost for bridge portion owe a lot. The approaches of bridge were to be constructed by IRCC and the bridge portion by UP State Bridge Corporation Ltd.

The tenders were called on the basis of the departmental design of bridge and approaches as provided with the tender documents. Choice was also given to quote the price on the basis of contractor's own design. The UP State Bridge Corporation decided to quote for both departmental design as well as their own design.

Main dimensions of bridges

Total length:	327 m, 10 spans
width:	9 m roadway + 2 footpaths 2.57 m each

Reasons for giving the alternative design

The reasons for giving the alternative design were based on constructional advantages and economical design.

In India mostly well foundations are used for bridges. Experience has been gained in their construction and design techniques in different types of strata. In some cases well foundations as deep as 45 m have been constructed. As such, adequate trained staff and labour specially the experienced teams of sinkers are available for doing the specialised job of well sinking.

As the bore chart also showed layers of gravel or even sandstone, it was thought more difficult to cut through this strata for making the bored piles while wells having larger dredge holes are easier to work with in such stratas by sending workers inside after dewatering them and doing the rock cutting with the help of compressor.

Lesser number of beams in the superstructure besides reducing the quantum and cost of its construction also reduced the dead weight of the bridge superstructure resulting in economical design of substructure and foundation also. Besides the economy affected in the design of superstructure and other components as above the well foundations were preferred being more economical and sound proposal from the following considerations:

a) Optimum utilisation of base area of the foundations:
In well foundations entire area of base is more or less fully utilised in transferring the load whereas in pile foundations some piles are loaded more and some are loaded less because of number of piles acting in a group.

b) Controlled conditions of work:
In well all concreting is done above the ground and as such quality can be ensured and con-

View of the completed bridge

trolled. In case of bored piles the concreting is done under ground under uncertain conditions and there are always chances of lesser diameter of pile and poor quality of concrete.

c) Avoiding the costly pile cap.:
In most of cases, very wide and heavy pile cap is needed to cover all the piles which are to be spaced at certain minimum distance. This makes the proposal usually very costly.

d) Certainty of load carrying capacity:
In well foundations the bearing capacity of soil at founding level can be known and the design of well can be done with much certainty. In case of piles load carrying capacity of individual piles are found out which do not give a true picture of the load carrying capacity of group of piles. Moreover only few piles are test loaded because of cost and time involved and these generally do not give the idea of load carrying capacity under different locations.

e) Uniformity of soil strata at base:
Well foundations usually rest on uniform soil strata because of being single foundation unit spreading over a comparatively smaller area. In case of pile foundations where a large area is covered there are more chances of encountering different strata under different piles which creates further problems in design and construction.

f) Better suitability for scoured bed:
The river beds are always likely to be scoured under flood conditions. Under such conditions the well foundations are a much stronger and better solution as the lateral load capacity of exposed projecting piles above the scoured bed is much less.

Staff and labour

It was decided by UP State Bridge Corporation Ltd. to take almost all the technical staff and skilled labour from India. The staff and labour was about ninety.

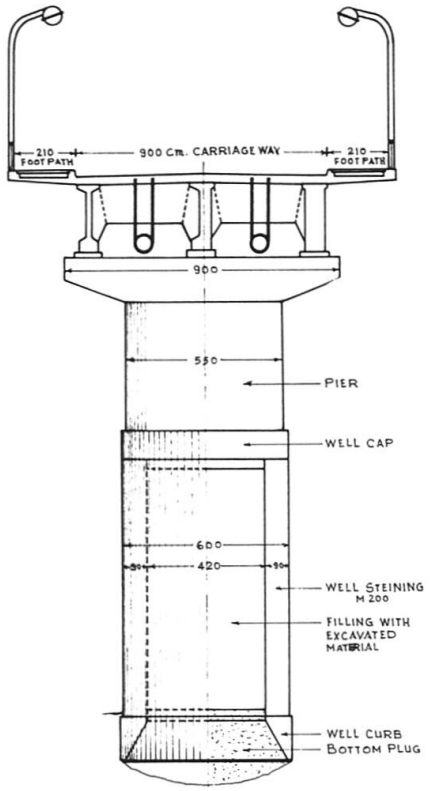
It was tried to export from India as much machinery as possible. Only that machinery which was either not available in India or which was urgently required was purchased from abroad. As the various formalities in exporting the material, equipments and machinery took too much time, and it took a least 6 months to reach the site even after the shipment was done, it was sometimes more expeditious in the interest of work to purchase machinery from the foreign firms or through their agents in Kuwait where the delivery time was much less.

Progress of work

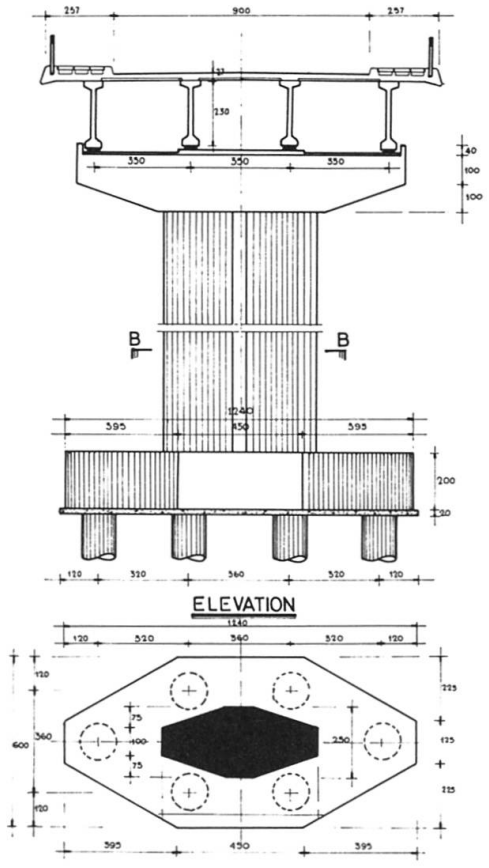
The work on the above project was started in November 1978 and completed in December 1981. The work was completed ahead of schedule inspite of a long spell of active war between Iraq and Iran.

The bridge has now been formally opened for traffic.

(Sh. Sharan)



Typical cross section as per alternative design



Typical cross section as per departmental design