



GHAZI BAROTHA CANAL

Pakistan, 1998

PROJECT CHARACTERISTICS

Works: large concrete lined canal with 46 three-spans bridges and superpassages

Purpose: feeder canal to a large hydro power plant

Dimensions:

- canal length: 50 km
- width at bottom: 58 m
- number of bridges and superpassages: 46
- length of bridges - superpassages: 100 m
- width of bridges - superpassages: 8 to 100 m

Foundation materials:

- sand-and-gravel, silty clay, sand and weak rocks

PROFESSIONAL SERVICES

Geotechnical Reports on foundations including evaluation of soil characteristics, bearing capacity and settlements with relevant computations. Report on stability of side slopes loaded by the bridge launching beam. Site assistance on specific topics.



The Ghazi-Barotha power channel derives waters off the Indus River, just downstream from the Tarbela reservoir, and conveys them to the power plant, running for 50 km across the densely populated left bank of the river, in the North - West of Pakistan. The canal cuts several tributary streams of the river, representing a major discontinuity for both population and the hydrographic system. Bridges and superpassages were necessary to connect villages on the two banks and to allow local creeks to flow over the canal along their original bed, to the river.

The power canal cross section is trapezoidal, with a water head of 10 m. The bottom is 58.4 m wide and the side slopes are 2H/1V. The canal slopes are lined with 0.25 m thick continuous cast in place concrete over a 0.3 m thick drain layer.

The decks of all bridges and superpassages consist of 1 to 10 U shaped, precast, concrete flumes. The relevant launching beam consisted of a 110 m long simply supported girder, which moved on wheels along the service roads. The deck is a continuous beam 100 m long, on 4 supports: 2 abutments and 2 piers with footings foundations. The base of the footings is set on the slopes about 6 m above channel bottom while all piers are founded about 2 m below the channel bottom grade.

After reconstructing the soil profile under each foundation, on the basis of all available borehole logs and SPT test, allowable foundation pressures (and the corresponding subgrade reaction coefficients) have been selected after computing the bearing capacity and the uniform contact pressure causing a 25 mm settlement.

Possible soil improvement techniques, like substitution of foundation layers and jet-grouting, were also studied.

