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INSTALLATION OF GATES ON THE SPILLWAY OF THE PUEBLO VIEJO DAM

by

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Generalities

The 300 MW Pueblo Viejo-Quixal hydroelectric scheme located in central Guatemala near the town of Coban was completed in 1986. The plant is the key element of the national electric grid, generating nearly 40% of the national electricity supply once put into operation.

The 130 m high Pueblo Viejo rockfill dam is situated at the entrance of a narrow gorge impounding a reservoir of 460 x 10^6 m^3 capacity with a maximum surface of 14 km^2. The general dam layout and the appurtenant structures are shown in **Figure 1**. After dam completion, one of the diversion tunnels was plugged, whereas the second was transformed in a bottom outlet (Nr. I) with a capacity of 170 m^3/s. A second bottom outlet (Nr. II), on the right bank with a capacity of 460 m^3/s was included in the final plant layout to provide an impounding control during the first reservoir filling.

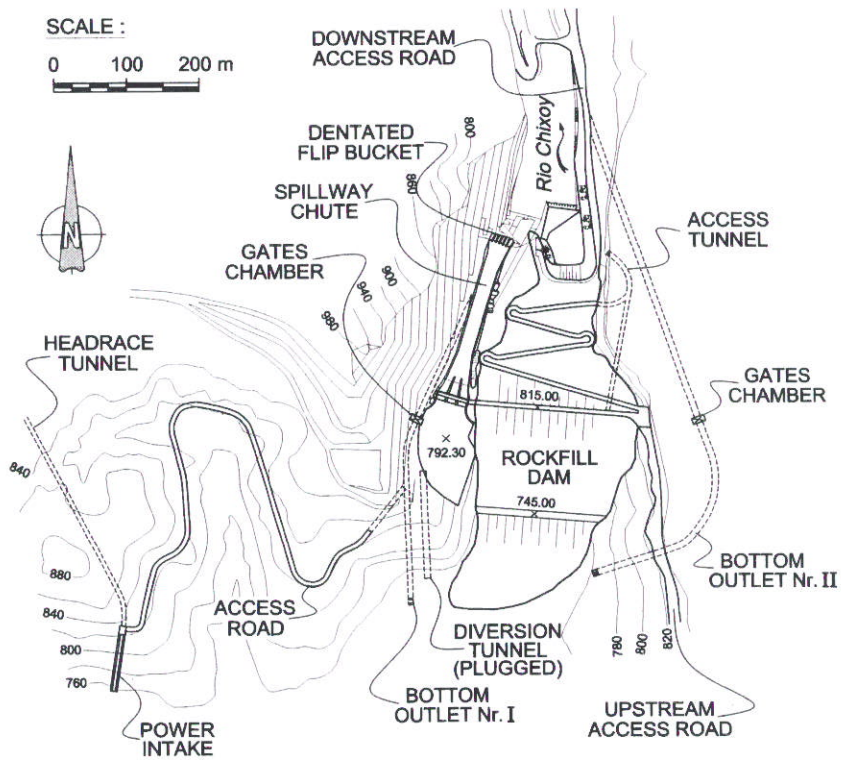

Fig. 1: General layout of the Pueblo Viejo dam.

The spillway structure excavated on the left bank consisted of three ungated overflow bays and a spillway chute ending with a flip bucket diverting the flow into the tailrace plunge pool. A 14 m hydraulic head, corresponding to a reservoir at el. 814.00 m a.s.l., was necessary to reach the 3900 m^3/s maximum spillway capacity.

The 26 km long headrace tunnel with a design capacity of 75 m^3/s supplies the five Pelton units of the Quixal powerhouse. **Figure 2** shows a general downstream view of the dam and of the spillway chute with the tailrace plunge pool in the foreground.

Fig. 2: Downstream view of the dam and the spillway chute with the dentated flip bucket and the tail-race plunge pool.

Project review

The feasibility study of the Pueblo Viejo Quixal scheme was completed in 1974 with the construction of the access road started two years later. The strong earthquake affecting Guatemala in 1976 and a severe flood occurring in 1979 during the river diversion caused major design changes of the scheme which had to be incorporated during the construction phase.