

عنوان مقاله:

varied foundations of chotiari reservoir

محل انتشار:

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خلاصه مقاله:

Chotiari Reservoir is a component of the Left Bank Outfall Drain Project in Sindh, Pakistan, located between the Lower Nara Canal and the Thar Desert, at a distance of approximately 16 kilometers (10 miles) North East of Sanghar. It is one of the most difficult sites from design as well as construction resources points of view. The reservoir is not very deep but its spread is very wide. It is the longest earth embankment for reservoir storage in Asia; the reservoir is formed by construction of about 56 kilometers (i.e. 35 miles) of earth embankment, generally of a low height ranging near 5 m (17.5 ft) with a maximum height of 15.24 m (50 ft). Though the embankment height is not much, adverse foundation conditions, scarcity of construction material and restrictions imposed by environmental requirements made it a challenging job. Due to its long length, the foundation conditions were highly variable. The northern rim of the reservoir was formed by sand dunes of the Thar Desert. Towards the south-eastern dykes, the foundations and abutments were in fact on sand dunes. Being in the vicinity of sand dunes, the foundation soils were generally sandy and relatively pervious towards deeper horizons. This made the design of a water tight foundation difficult. The construction of a deep cutoff was not possible due to most of the area being in a waterlogged condition. High seepages were expected through the reservoir rim and embankment foundation. A portion of the embankment and reservoir was situated over the Nara Canal. The sediments coming through the Nara Canal were sandy in nature. Therefore, future sealing of the reservoir bowl by the incoming sediments was a slow process. Moreover, in a major length the foundation materials were easily erodible and prone to piping. The problems were emphasized further with the necessity of slope protection requirements along large fetches. Suitable material for the fill and slope protection were at extensive haulage distances. A partial cutoff in the form of a key trench, with its width and depth varying along the embankment length, provided a considerable reduction of the underseepage by lengthening the seepage path. At other places, upstream and downstream weighted berms were added in, improving the creep length and subsequently the embankment stability. The overall embankment slopes were also varied to ensure safe design slopes throughout the embankment length. The slope protection systems were optimized to reduce both the costs and the extensive ... haulage operations. The piping problems were virtually eliminated by covering

کلمات کلیدی:

Earth embankment, Pervious foundations, Key trench, Berm, Drainage

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