Kurdistan Regional Government-Iraq

Salahaddin University - Erbil

College of Engineering

Water Resources Engineering Department

Engineering Project
(Design of Kolak Pond)

The Project submitted to the Water Resources DepartmentUniversity of Salahaddin – Erbil

In the partial Fulfillment of the Requirements for the Degree of Bachelor of Science Water Resources Engineering

Prepared by:

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(2022-2023)

Certificate:

I certify that the engineering project titled **"Design of Kolak Pond"** was done under my supervision at the Water Resources Engineering Department, College of Engineering -Salahaddin University -Erbil.

In the partial fulfillment of the requirement for the degree of bachelor of science in Water Resources Engineering.

Signature:

Supervisor Name: M. Sarkawt H. Muhammad

Date: 12 / 6 / 2023

Dedicated to:

Our parents who are supporting us during this year, to the employee of Erbil's Water director who help us to complete this project. To our supervisor M. Sarkawt H. Muhammad, and anyone who wants to help us.

Abstract

Earth dams are constructed from the available material at the site. In this project Kolak Pond were designed. due to the site condition and the availability of materials zoned earth dam were selected. This type of dam consists of clay core at the center supported by shell. In the first part of the design the hydrological study for the Kolak watershed were performed. For hydrologic geographic information system (GIS) with combination of Google earth is provided. The recorded rainfall data was taken from Erbil gauge station of about (26) years. The predicted rainfall for different return periods were estimated using Gumble distribution. The catchment area of the Kolak was found using GIS software which is 6.07 km^2, curve number is obtained based on soil type slope and land use land cover of the catchment area is divided into three sub catchments where the value of weighted curve number for the entire catchment is (77.98). The SCS method is used to estimate surface runoff and peak discharge the average yearly runoff of Kolak watershed is estimated about (51.37mm). Due to site condition the normal storage of Kolak Pond was fixed as (3.41MCM). The chute spillway of Kolak Pond is designed based on 50-year return period discharge which is equal to (83.49 m^3 /sec).