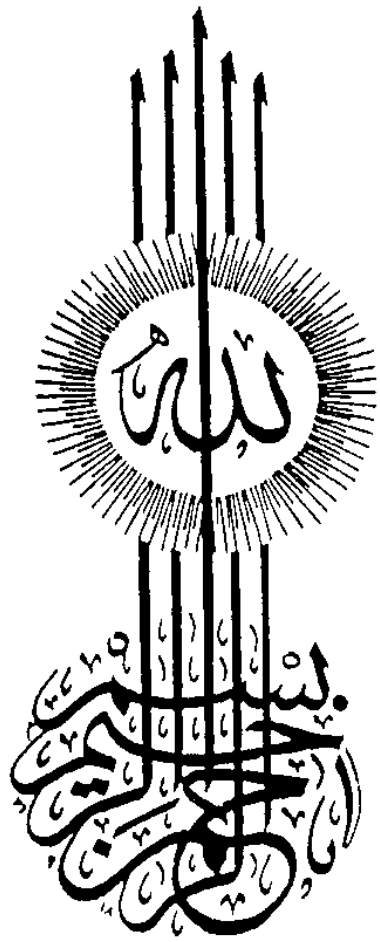
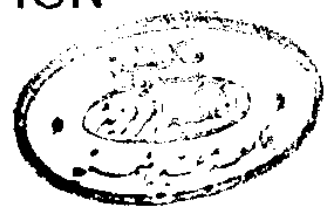


DESIGN OF SMALL EARTHEN CANALS USING THE REGIME TYPE EQUATION



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A THESIS

Submitted In Partial Fulfilment For Degree of Master of Science In Civil Engineering

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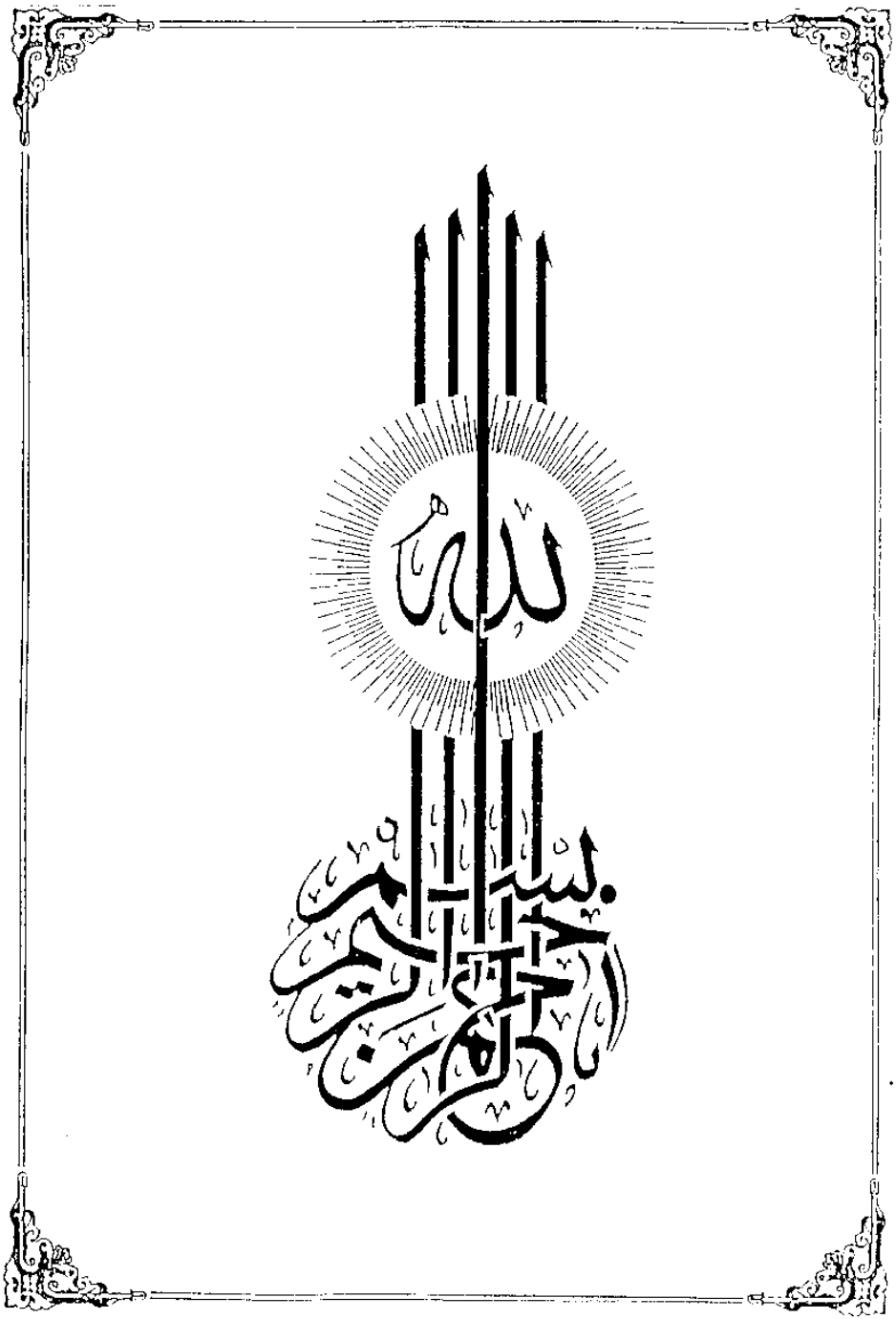

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STATEMENT

This dissertation is submitted to Ain Shames University for the degree of Master of Science in Civil Engineering.

The work included in this thesis was carried out by the author in the Department Irrigation and Hydraulics, Faculty of Engineering, Ain Shames University, from 13-10-1986 to March 1991.

No part of this thesis has been submitted for a degreeor a qualification at any other University or Institution.

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ABSTRACT

During the last 40 years the design practice for earthen canals in Egypt was based on El-Difrawy, Molesworth, and Yenidonia regime equations. These equations were deduced from the analysis of collected data for some stable earthen canals before the construction of High Aswan Dam (H.A.D). At present such equations become inadequate for the new regime occurred to the canals systems, and new design concept is needed.

Investigations were carried out in Egypt (Khattab et al. 1985,1987) based on field study to some stable canals and on many collected data available at the Ministry of Public Works and Water Resource and others, where a series of design regime type equations for earthen canals were deduced. These equations have correlated the relationship between the flow parameters and the canal geometrical elements of water cross-section area and the water surface slope. These equations are only valid for designing of stable earthen canals having sand loam bed and cohesive banks with discharges range from 2.0 to 200 m^3/sec, and for canals having sand bed and banks with discharge range from 90 to 200 m^3/sec. Applying these equations for discharges out of these limitations, unpracticable values will be obtained, for that the present work is made to complete the discharge gab which is not taken in Khattab et al. equations.

The work of the present investigation is based mainly on field study of 22 carefully selected stable irrigation channels in Egypt. From the analysis of the collected data a set of regime type equations are deduced.

Results showed that the deduced equations can be used safely in Egypt for designing stable earthen canals having cohesive soil bed and banks (silt-clay) with discharges ranged from 0.1 to 2.0 m^3/sec, and for canals having sandy soil (sand bed and banks) with discharge ranged from 0.1 to 5.0 m^3 /sec.

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CHAPTER IV FIELD AND EXPERIMENTAL WORK

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