AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING

"DESIGN OF DRIP IRRIGATION SYSTEM FOR RECLAIMED LANDS IN EGYPT, USING COMPUTERS"

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DGREE OF
MASTER OF SCIENCE IN CIVIL ENGINEERING

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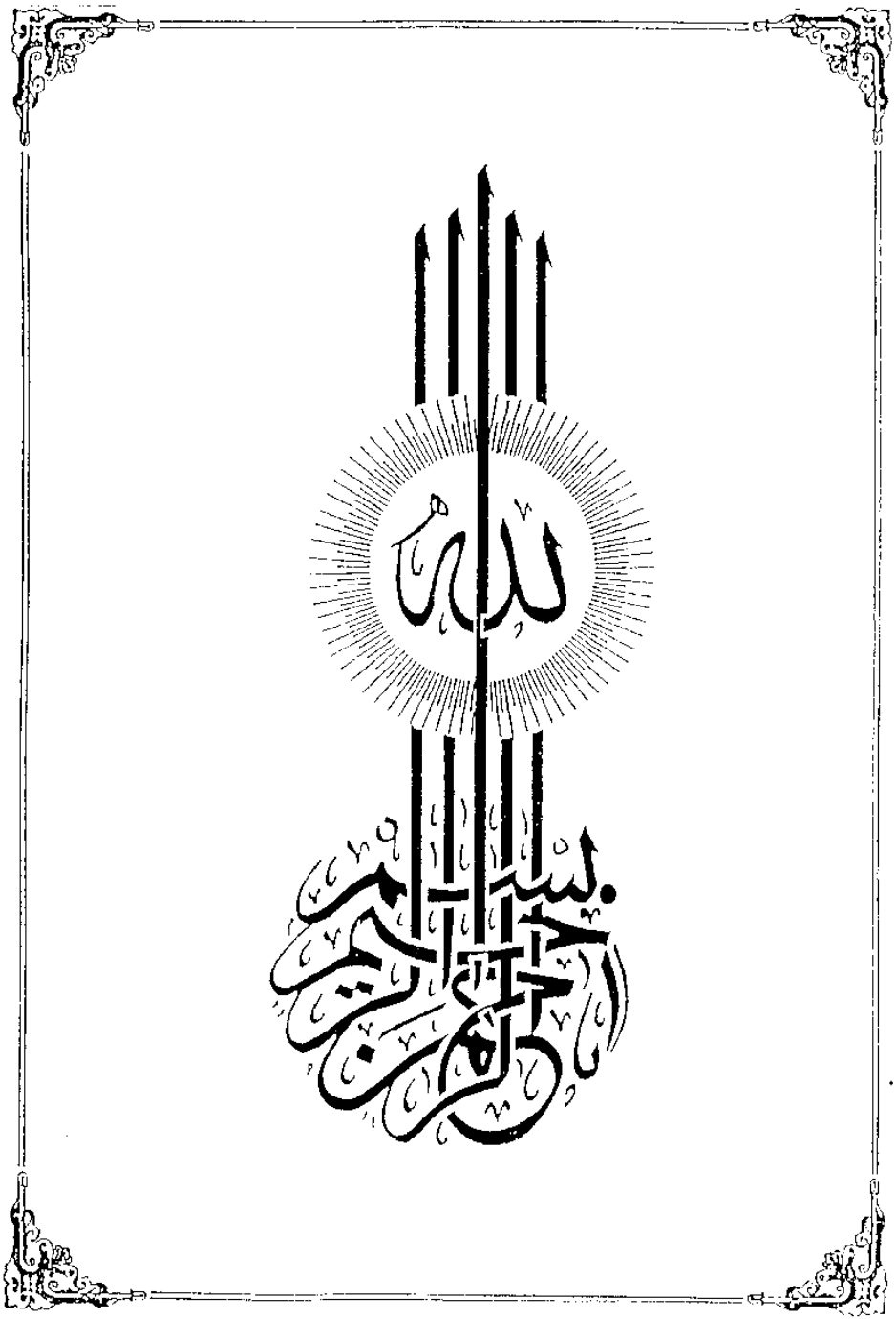

STATEMENT

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

The work included in this thesis was carried out by the author from October 1986 to Nov. 1994.

No part of this thesis has been submitted for a degree or a qualification at any other University or Institute

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ABSTRACT

DESIGN OF DRIP IRRIGATION SYSTEM FOR RECLAIMED LANDS IN EGYPT, USING COMPUTERS

Manual design of drip irrigation system cannot determine the most economic solution and the optimum value of the design parameters. The huge number of parameters may not be included; as this needs several trials and a lot of time and effort. This leads to a reduction of irrigation efficiency, increase of the cost of the drip irrigation system and lowering the benefit - cost ratio. To overcome these defects, two computer programs have been developed:

- The first optimizes the design of drip pipe network for a plot, from the furthest emitter to the hydrant, using the least cost method and taking into account some constraints such as determining the optimum method for computing the reference evapotranspiration, the effect of crop type and soil on specifying the emitter discharge and emitter layout, the effect of emitter type on allowable friction losses in laterals and manifolds, checking the required % of wetted soil area and % of emission uniformity. The output is the optimum diameter, length and material of pipes, the optimum irrigation interval and application time, the pipe network cost, the required energy, the discharge and head at the plot hydrant.
- The second determines the optimum diameter and material for the sections of pressure distribution network, the optimum piezometric head at the pump station, the optimum layout of the pipe network for a certain area, the optimum area allocated for the pump station and the optimum number of pump units. The program is fed with a description table for each layout of pipe network and a table of suitable pipes.

Two examples for the first program and one example for the second program are applied in this study, using the relevant data of a reclamation project on Cairo - Ismaelia road.

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