AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

INVESTIGATION AND DESIGN OF MITER-TYPE LOCK GATES

Thesis submitted in the partial fulfillment of the requirements for the degree of Master of Science

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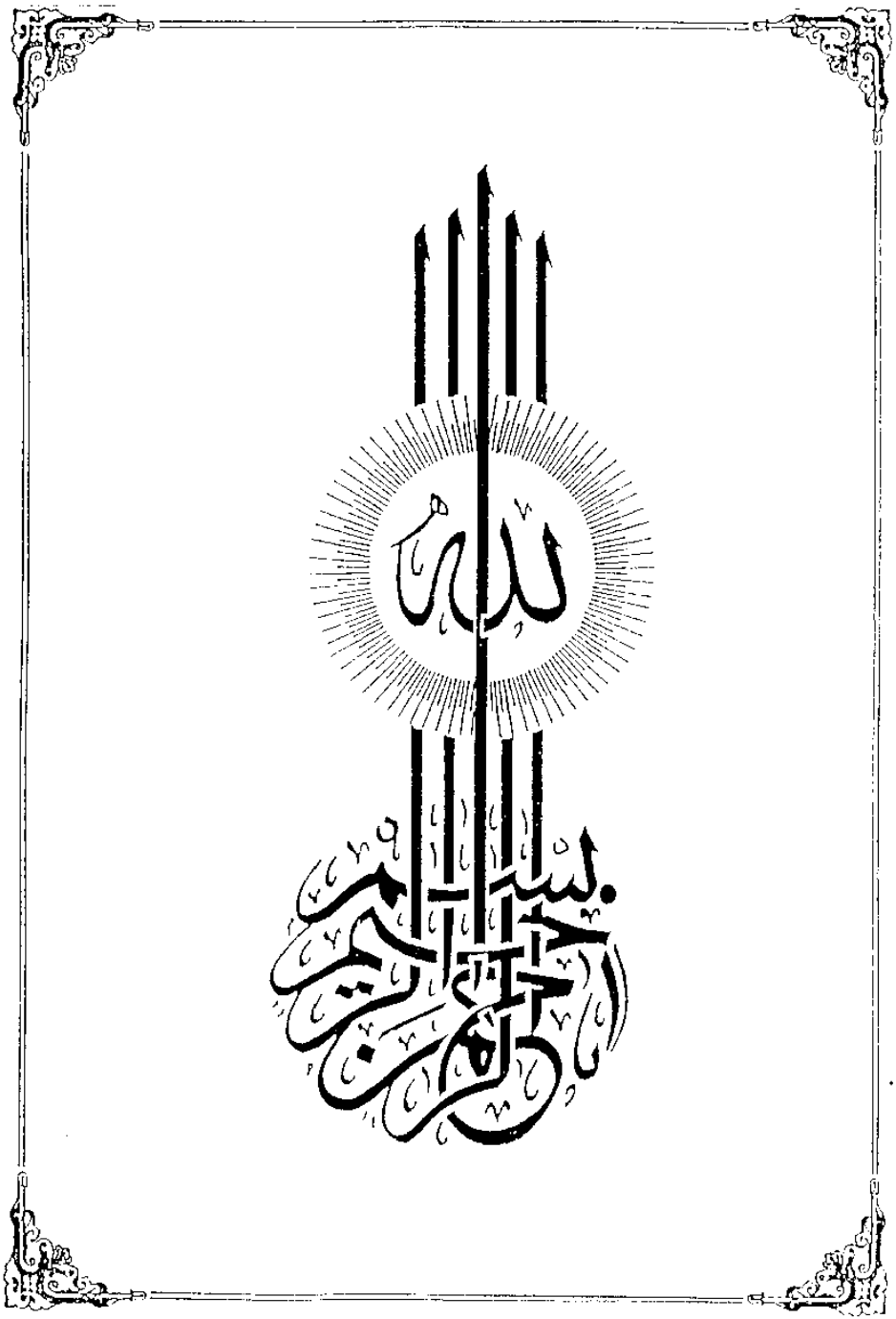

STATEMENT

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 in the Department of Hydraulics and Irrigation , Ain Shams University, **from October 1986 to April 1989.**

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

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ABSTRACT

The present thesis is planned to provide more detailed information on the miter type lock gates analysis. Moreover, the study deals with the effect of the drawbacks during operation or execution on the stresses and deformations of the gate. The classical analysis can not give a deep view for these effects. So, a theoretical analysis applying the finite element method (using the SAP80 Program) has been applied to some gates with different dimensions and properties. Moreover, this finite element model is verified in order to check it against real data from the field. As a conclusion from the analysis of results obtained from the finite element model , the major reason of the gate tilting and failure is that the miter post is not completely coinciding for the two gates.

In addition, the finite element analysis is applied to the miter type lock gate for the new Naga Hammadi lock which is being currently erected at the Upper Egypt. This gate will be the highest miter gate in Egypt. The effect of the drawbacks which, may occur during the execution or operation of this gate, on the stresses at the different elements of the gate are studied.

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