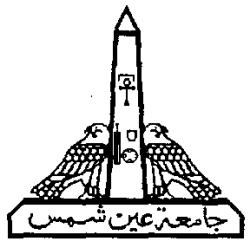

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
IRRIGATION & HYDRAULICS DEPARTMENT

TRANSPORT PHENOMENA IN COASTAL WATERS

A THESIS SUBMITTED TO THE
Irrigation & Hydraulics Department
Faculty Of Engineering
Ain Shams University

IN THE FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF PHILOSOPHY OF DOCTORS
CIVIL ENGINEERING - IRRIGATION & HYDRAULICS [1996]

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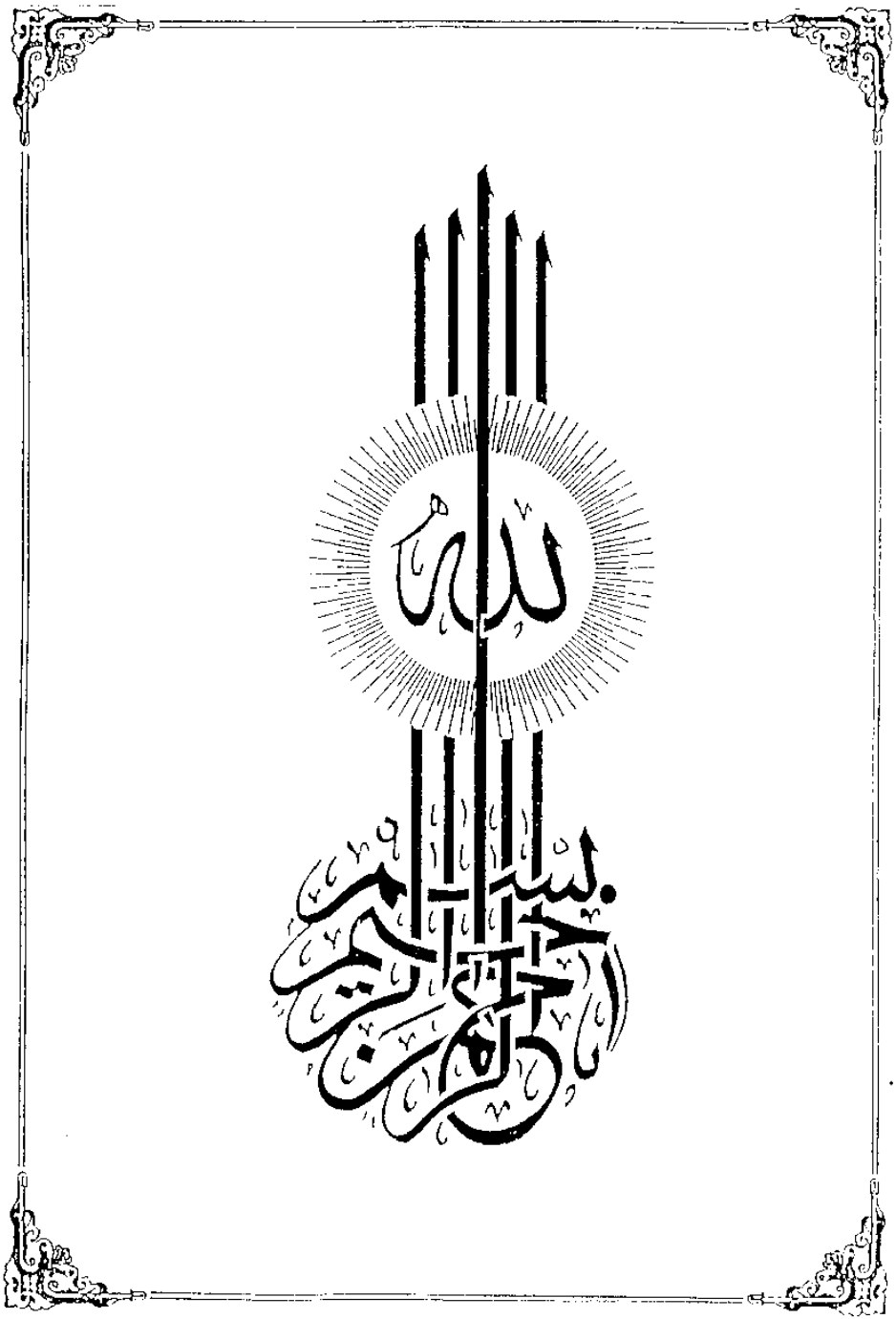


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A Ph.D. Thesis

NAME: **Mootaz Ahmed Mounir Khaled**

TITLE: Transport Phenomena in Coastal Waters

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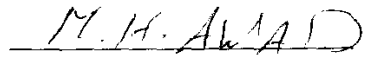

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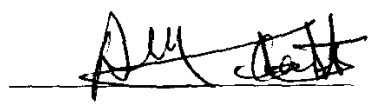

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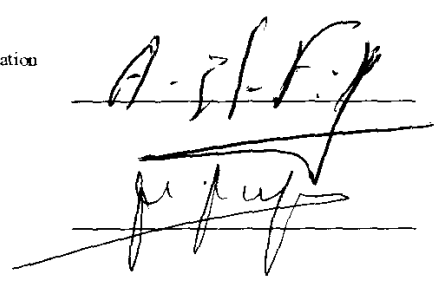

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STATEMENT

This thesis is submitted to the Irrigation & Hydraulics Department, Faculty of Engineering, Ain Shams University *in the fulfillment of the requirements for the* Degree of Philosophy of Doctors.

The work in this thesis was carried out in the Irrigation & Hydraulics Department, Faculty of Engineering, Ain Shams University from November 1992 to January 1996.

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

Date: 26/6 /1996
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ABSTRACT

Mootaz Ahmed Mounir Khaled. **TRANSPORT PHENOMENA IN COASTAL WATERS**. Doctor of Philosophy, Ain Shams University.

The main objective of this study is constructing a numerical model to predict shoreline changes at coastal inlets, specially the Egyptian coastal inlets at the northern coast. EL- Burullus inlet has been chosen as an example for the Egyptian inlets.

A special set of wave data is prepared to simulate the wave conditions on the Egyptian Northern coast. This set is checked using the Raylight Probabilistic Distribution.

The model is divided into many parts. The first part calculates wave refraction and breaking. The second part calculates the amount of transported sediment due to the wave generated current by using the CERC formula. Then, the shoreline changes are calculated using the finite difference method.

The sensitivity of the model is checked for various variables. Where, the wave height is the most important one.

Measured offsets of EL-Burullus shoreline are used to verify the model.

Finally, the model is used to predict the shoreline at EL-Burullus Inlet in 2039. It is found that dredging the inlet regularly and compensating the lost beach material caused by wave attack are the best solutions to stabilize the shoreline.

KEY WORDS: Coastal Inlets, Tidal Inlets, Shoreline Changes, Numerical Modeling

TO

THE SOUL OF MY GREAT FATHER

MY DEAR MOTHER

AND MY SISTER

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