AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

IRRIGATION AND HYDRAULICS DEPARTMENT

DEWATERING BY HORIZONTAL INFILTERATION GALLERIES

BY

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A Thesis Submitted for the partial fulfillment of the requirements

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Master of Science

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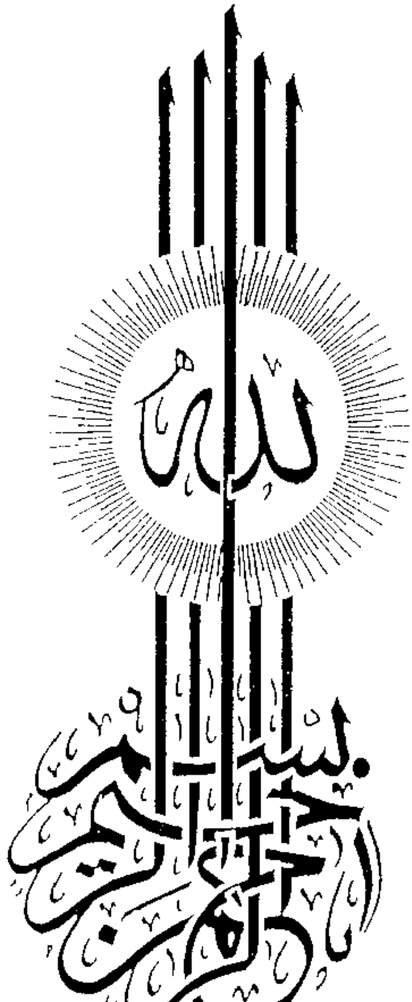
بسم الله الرحمن الرحيم

فلله الحمد رب السموات ورب الأرض رب العالمين

وله الكبرياء في السموات والأرض وهو العزيز

الحكيم

صدق الله العظيم


بسم الله الرحمن الرحيم

To My Parents

My Wife

My Son Ahmed

My Daughter Toka

My Brothers

My Sisters

We certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality as a dissertation for the degree of Maser of Science.

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STATEMENT

This thesis 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 auther in the department of Irrigation and Hydraulics. Ain Shams University from January 1993 to November 1996.

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

Date: / /1996

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Signature

CONTENTS

LIST OF SYMBOLS

Symbol	Description
K	Coefficient of permeability.
g	Acceleration due to gravity.
u	Components of the velocity in x-direction.
v	Components of the velocity in y-direction.
φ	Velocity potential.
ψ	Stream Function.
(x, y)	Space perpendicular coordinates system.
ω	Complex potential=$\varphi + i\psi$.
i	$(-1)^{1/2}$.
z	Analytic function = $x+iy$, Physical plane.
m	The strength of the drain.
Q	The discharge reaching unit length of the drain.
h	Maximum head of water above the drain.
C, C_1, C_2	Arbitrary constants.
$P(\eta, \xi)$	Pressure at general point(η, ξ) on the phreatic surface of water.
d	Drain diameter.
S	Horizontal distance from drain to the begining of the phreatic surface.
L	Spacing between two drains.
B, B_1, B_2	Arbitrary constants.
H	Height of water midway between two drains.
F_1, F_2, F_3	Local function, were defined in equations (3.43), (3.44), (3.45).
F	Local function, were defined in equation (3.54).
L_t	Total length = $L+2S$.
$P\%$	Perforation Ratio, The openning area to the total surface area of the drain.
Q'	Relative Discharge reaching unit length of drain per panel =Q/Kh.
d'	Relative drain diameter =d/h.
S'	Relative Distance =S/h.
L'	Relative spacing between two drains =L/h.

LIST OF FIGURES