Ain Shams University

Faculty of Engineering

BEHAVIOUR OF REINFORCED CONCRETE BLOCK MASONRY WALLS UNDER CONCENTRATED LOADS

BY

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A Thesis

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requirements of the degree of Master of Science

in Structural Engineering

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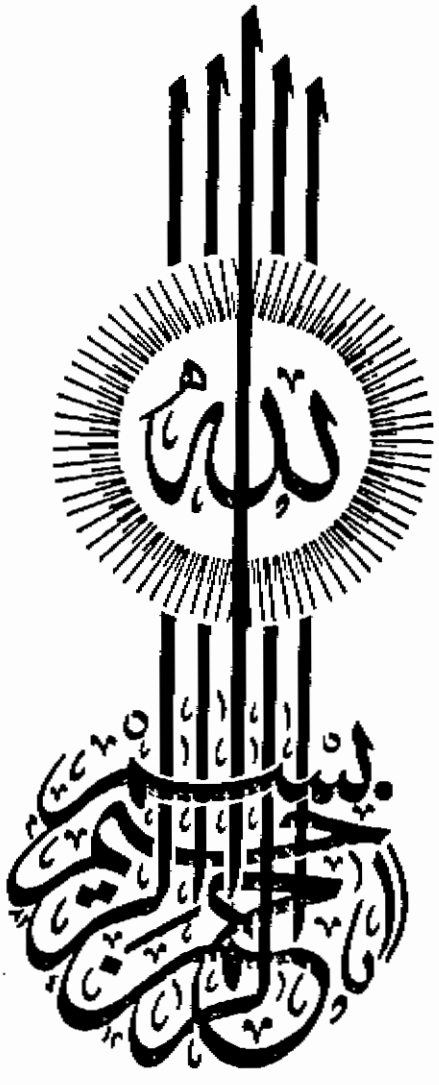

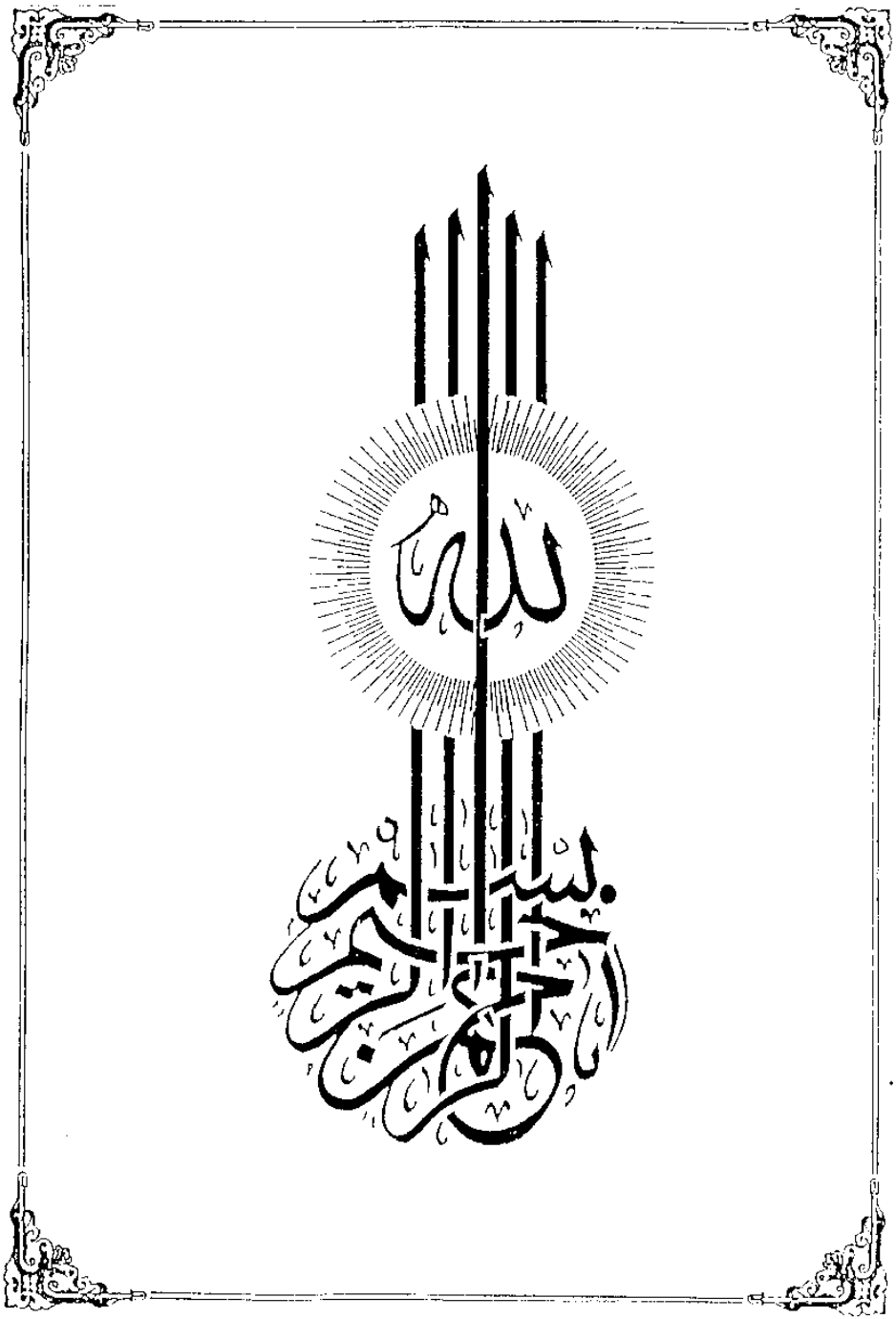

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Statement

The dissertation is submitted to Ain Shams University for the degree of MASTER OF SCIENCE in Structural Engineering.

The work included in this thesis was carried out by the author in the department of Structural Engineering, Ain Shams University, from November 1986 to October 1989.

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

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TO MY PARENTS, FIANCÉE

AND

MY FAMILY

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NOTATIONS

a	Dimension of element in x direction.
A_n	Net area.
A_s	Area of steel.
b	Dimension of element in y direction.
c	Intrisic shear strength (cohesion).
[D]	Elastlcity matrlx.
E	Modulus of elasticity.
E_g	Tangent modulus of grout.
E_{gs}	Secant modulus of grout.
f_a	Actual axial compressive stress.
f_b	Actual bending stress.
f_g	Strength of grout in compression.
f_m	Strength of mortar in compression.
f_s	Allowable steel stress.
f_{tb}	Splitting tensile strength of blocks.
f'_t	Uniaxial tenslle strength.
f'_c	Uniaxial compressive strength.
F_a	Allowable axial compressive stress.
F_m	Allowable flexural compressive stress.
G	Modulus of rigidity.
h	Effective height of wall.
IRA	Initial rate of absorption.
K_n	Stiffness in the normal direction.
K_s	Stiffness in the shear direction.

$[K_e]$	Element stiffness matrix.
L	Length of joint element.
m_o	Compressive strength of mortar.
M	Bending moment.
n	Modular ratio.
P	Applied force.
t	Effective thickness of wall.
t_m	Mortar joint thickness.
t_w	Actual wall thickness.
u	Displacement in the x direction.
v	Displacement in the y direction.
V	Shear force.
w_b	Unit weight of blocks.
w_g	Unit weight of grout.
Z	Section modulus.
$\alpha_{1,2,\ldots,8}$	Coefficients.
α	Reduction factor of the modulus of elasticity.
β	Reduction factor of the modulus of rigidity.
ε	Strain.
ν	Poisson's ratio.
$[\sigma]$	Stress matrix.
$[\sigma_{av.}]$	Average stress matrix.
$\sigma_{1,2}$	Peak principal stresses.
σ_n	Normal stress.
σ_s	Shear bond strength.
σ_{so}	Shear bond stress at failure.

σ_t	Tensile bond strength.
σ_{to}	Tensile bond stress at failure.
τ	Shear stress.
μ	Coefficient of friction.
ϕ	Angle of internal friction.

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