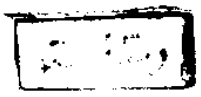
Ain Shams University
Faculty of Engineering

ANALYSIS OF CURVED STEEL BRIDGES

A Thesis submitted in partial fulfillment of the requirements
for the degree of master of science
in Civil Engineering (Structural)



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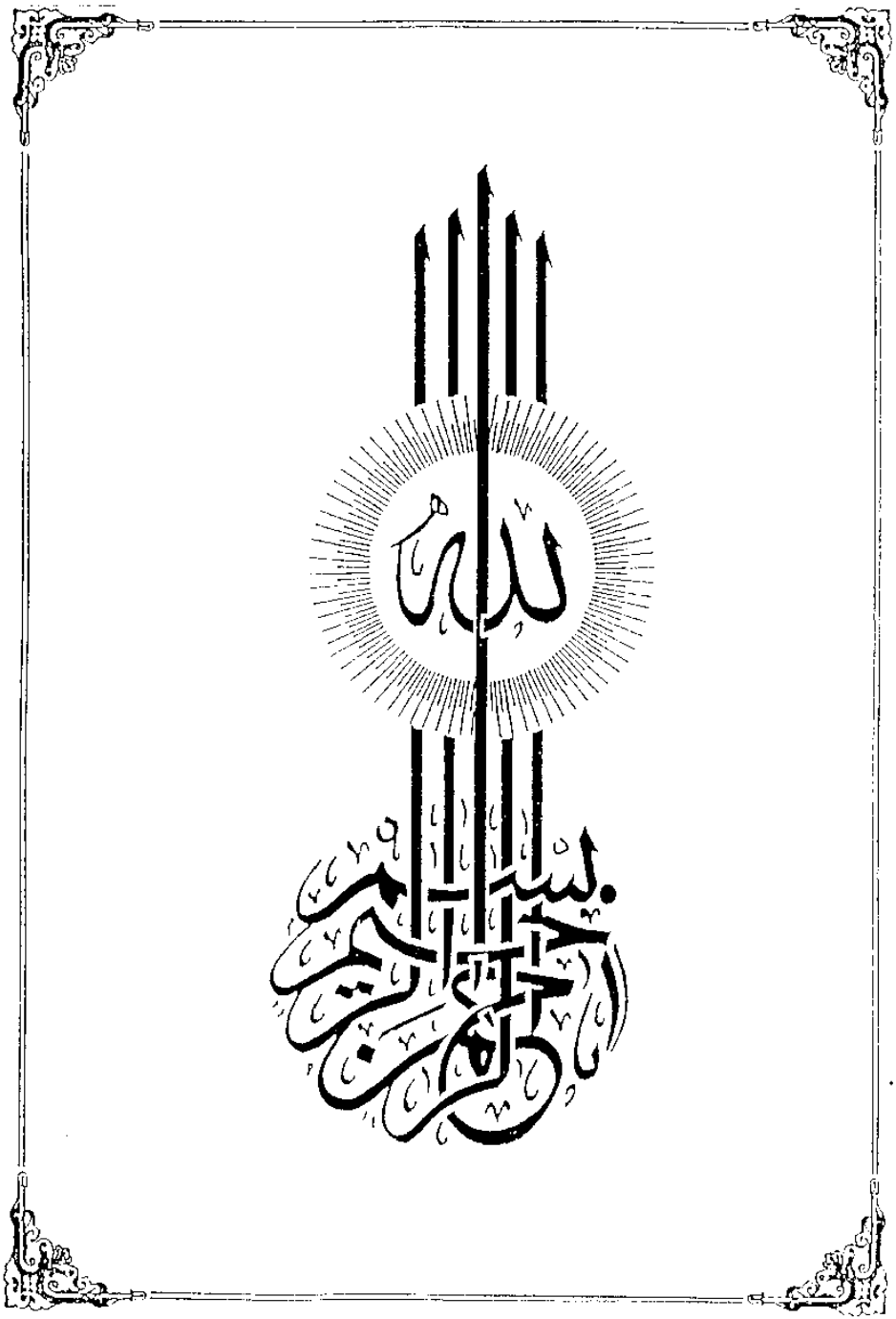

Statement

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

The work included in this thesis was carried out by the author in the department of Structural Engineering , Ain Shams University

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 of the M.Sc. Thesis submitted by : Afdal Ali Lasheen
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Abstract

The main object of this thesis is to study the effect of the different parameters governing the design of steel curved bridges as well as studying the effect of the different finite element models of idealization on the bridge behavior .A primary study was made to find the minimum requirements to idealize a curved composite steel-concrete beam by the finite element method of analysis. Many idealization models were chosen and their results were compared together and with published theoretical results to find the advantages and disadvantages of every model. The best model chosen for idealizing the girders of the bridge was that which gives the closest solution to the theoretical one. Design formulas and curves have been provided for the bending and warping stresses as well as for deflection distribution factors of the exterior girders. These take into consideration the arc length ,the radius of curvature of the bridges, the number of cross frames (diaphragms), the slab thickness and the girder inertia. Also, an influence surface formula has been provided for the distribution factors of the exterior and interior girders caused by live load moving transversely across the deck and located longitudinally at a point that produces maximum bending moment. A brief summary, discussion of the results and conclusions are given.

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