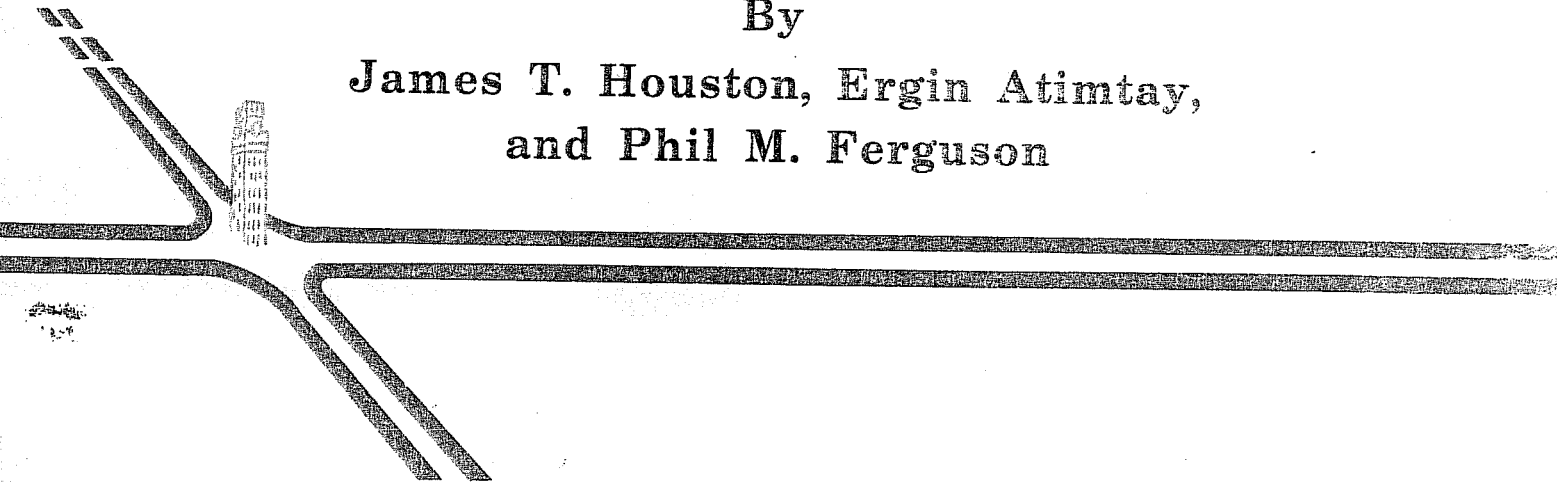


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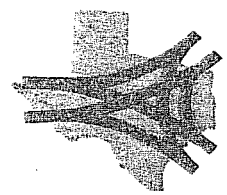


RESEARCH REPORT 112-1F

PROJECT 3-5-68-112

COOPERATIVE HIGHWAY RESEARCH PROGRAM
WITH TEXAS HIGHWAY DEPARTMENT
AND
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

CENTER FOR HIGHWAY RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
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Research Report No. 112-1F

Research Project Number 3-5-68-112
Crack Width-Corrosion Study

Conducted for

The Texas Highway Department

In Cooperation with the
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by

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THE UNIVERSITY OF TEXAS AT AUSTIN

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The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

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PREFACE

This report describes the research techniques and results obtained during a four year project (1967-71) entitled "Crack Width-Corrosion Study" (Study No. 3-5-68-112). This report is a complete presentation of the research as no other formal report preceded the termination of the research program.

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March 1972

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ABSTRACT

Results of a literature review provide a broad overview of more than twenty parameters affecting the process of corrosion of reinforcing steel in concrete. In addition, a four year experimental program utilizing a relatively severe salt spray exposure to promote corrosion in numerous loaded beams and unloaded slab specimens is reported. Experimental parameters used in the study included quality of concrete (cement type, water-cement ratio, aggregate type, relative permeability), placement of steel and concrete (concrete cover, bar size, bar spacing, casting position), and exposure and loading conditions (concrete cracking, level of steel stress, prestressing, rates of corrosion). The study of these parameters provides information useful in the selection of the concrete quality and structural detail required to produce corrosion resistant structures.

KEY WORDS: corrosion, chloride, rusting, reinforcing steel, stress, cover, concrete, quality, durability, water-cement ratio, permeability, aggregates, cracking, structural.