

**FURTHER PROBLEMS IN THE THEORY AND
DESIGN OF STRUCTURES, AN
ADVANCED TEXT-BOOK
FOR THE USE OF STUDENTS,
DRAUGHTSMEN AND ENGINEERS
ENGAGED IN CONSTRUCTIONAL WORK**

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Further problems in the theory and design of structures, an advanced text-book for the use of students, draughtsmen and engineers engaged in constructional work by Ewart S. Andrews

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EWART S. ANDREWS

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By the Same Author.

**THE THEORY AND DESIGN
OF
STRUCTURES.**

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FURTHER PROBLEMS
IN THE
THEORY AND DESIGN
OF
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AN ADVANCED TEXT-BOOK

*For the use of Students, Draughtsmen, and Engineers
engaged in Constructional Work.*

BY

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WITH NUMEROUS ILLUSTRATIONS AND
WORKED EXAMPLES.

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PREFACE.

HAVING regard to recent developments in the subject and from experience in the lecture-room, the author has realised that the earlier book upon the *Theory and Design of Structures* omitted to deal with several problems that are of interest and importance to engineers. At the same time, the earlier book covers a fairly wide ground, which appears satisfactory for many engineers; and, after consideration, it was decided to keep the original book practically intact, and to write an additional volume.

The same general aim has been kept in view in the present as in the previous work: namely, to give treatments which are theoretically sound, while presenting those treatments in as clear and simple a manner as possible. An attempt has been made to give nearly all the steps involved in mathematical deductions; this is at the risk of criticism that the explanations are rather long, but experience has shown that many students find it very difficult to insert the gaps in mathematical reasonings that are usually made in text-books.

The first portion of the book deals with the method of Influence Lines, which has been developed to a considerable extent within recent years; next comes the Principle of Work and its application to deflections of framed structures, redundant frames, and rigid arches; finally, we have Portals and Wind Bracings and Secondary Stresses, the importance of the analysis of both having been more fully realised within recent years, though they have not yet received the adequate treatment which they deserve.

The author wishes to express his indebtedness to the various sources of information referred to in the text. Particular thanks are due to the Council of the Institution of Civil Engineers, Dr. F. C. Lea and Mr. Ralph Freeman, A.M.I.C.E., for permission to make use of their papers upon 'Influence Lines' and 'Two-hinged Spandril-braced Steel Arches' respectively; to the Editors of the *Architects' and Builders' Journal*, *Concrete and Constructional Engineering*, *Engineering Review*, and the *Engineering News* (New York) for matter appearing in these journals; and to Mr. F. L. Brown, for kindly reading the proofs.

The author will be glad to hear of any printer's errors or discrepancies that may be found.

EWART S. ANDREWS.

Goldsmiths' College, New Cross, S.E.
April, 1913.

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