ASCE Manuals and Reports on Engineering Practice No. 113

## Substation Structure Design Guide





# Substation Structure Design Guide

Prepared by

the Subcommittee on the Design of Substation Structures of the Committee on Electrical Transmission Structures of the Structural Engineering Institute of the American Society of Civil Engineers

> Edited by Leon Kempner, Jr.





Library of Congress Cataloging-in-Publication Data

Substation structure design guide : ASCE manuals and reports on engineering practice no.
113 / Prepared by the Subcommittee on the Design of Substation Structures of the Structural Division of the American Society of Civil Engineers ; edited by Leon Kempner.
p. cm.
Includes bibliographical references and index.
ISBN-13: 978-0-7844-0935-0 (alk. paper)
ISBN-10: 0-7844-0935-8 (alk. paper)
1. Structural design–Handbooks, manuals, etc. I. Kempner, Leon. II.
American Society of Civil Engineers. Subcommittee on the Design of
Substation Structures .
TA658.3.S83 2007
621.31'26–dc22

2007016342

Published by American Society of Civil Engineers 1801 Alexander Bell Drive Reston, Virginia 20191

#### www.pubs.asce.org

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15 14 13 12 11 10 09 08 07 1 2 3 4 5

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### PREFACE

The Subcommittee on the Design of Substation Structures of the Committee on Electrical Transmission Structures of the Structural Engineering Institute of ASCE developed this manual. The subcommittee membership represented utilities, manufacturers, consulting firms, academia, research, and general interest. The combined expertise of the subcommittee members contributed to make this a valuable substation structure design guide for the utility industry.

The primary purpose of this manual is to document electrical substation structural engineering practice and to give guidance and recommendations for the design of outdoor electrical substation structures. The guide presents a review of structure types and typical electrical equipment. Guidelines for analysis methods, structure loads, deflection criteria, member and connection design, structure testing, quality control, quality assurance, connections used in foundations, detailing, fabrication, construction, and maintenance issues are presented. The recommendations presented herein are based on the professional experience of the subcommittee members, and although the subject matter of this manual has been thoroughly researched, its application should be based on sound engineering judgment.

The subcommittee wishes to thank the Peer Review Committee for their assistance and contributions to this document.

### **Peer Review Committee**

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