

Australian Standard™

**Steel shoring and trench lining
equipment**

Part 1: Design

This Australian Standard was prepared by Committee ME/82, Shoring and Trench Lining. It was approved on behalf of the Council of Standards Australia on 4 August 2000 and published on 20 November 2000.

The following interests are represented on Committee ME/82:

Australian Industry Group
Civil Contractors Federation
Concrete Pipe Association of Australasia
Construction, Forestry, Mining and Energy Union
Department of Employment, Training and Industrial Relations (Qld)
Institution of Engineers Australia
Master Plumbers and Mechanical Services Association of Australia
Water Services Association of Australia
WorkSafe Western Australia

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

Australian Standard™

**Steel shoring and trench lining
equipment**

Part 1: Design

First published as AS 4744.1—2000.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 3556 8

PREFACE

This Standard was prepared by the Standards Australia Committee ME/82.

The objective of this Standard is to provide safe specifications for the design and rating of steel shoring and trench lining equipment for use in trench digging operations thus providing the knowledge necessary to minimize the likelihood of trench collapse resulting in fatality.

This Standard is based on draft CEN Standard prEN 13331-1, *Trench lining systems*, Part 1: *Product specifications*, and Part 2: *Assessment by calculation or test*. It differs from those documents in that a lower minimum shield rating of 20 kPa is allowed.

Published Standards in the series are:

AS

4744 Steel shoring and trench lining equipment

4744.1 Design

It is intended to publish the following part:

Safe use

Australian Standards are not intended, in their own right, to be retrospective. They usually apply to new plant. The relevant authorities in each State may or may not require that all existing plant comply with this Standard. Individual authorities should be consulted as to whether they require existing plant to comply with this Standard.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
FOREWORD	4
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 APPLICATION	5
1.3 GENERAL	5
1.4 NEW DESIGNS AND INNOVATIONS	5
1.5 REFERENCED DOCUMENTS	5
1.6 NOTATION	6
1.7 DEFINITIONS	7
SECTION 2 SYSTEM AND COMPONENTS—DESCRIPTION AND EXAMPLES	
2.1 COMMON TRENCH LINING SYSTEMS	9
2.2 SUPPORTING COMPONENTS	12
2.3 STRUT TO PANEL/SLIDE RAIL CONNECTION	14
2.4 PANEL TO PANEL CONNECTIONS	15
SECTION 3 DESIGNATION	
3.1 PANEL DESIGNATION	17
3.2 STRUT DESIGNATION	17
3.3 SLIDE RAIL DESIGNATION	17
SECTION 4 MATERIALS	
18	
SECTION 5 DESIGN REQUIREMENTS	
5.1 GENERAL REQUIREMENTS	19
5.2 MINIMUM RATED SYSTEM CAPACITY	20
5.3 MAXIMUM ELASTIC DEFLECTION	20
5.4 ATTACHMENT POINTS	20
5.5 STRUTS	21
5.6 STRUT TO PANEL OR SLIDE RAIL CONNECTION	24
SECTION 6 INSTRUCTION MANUAL	
6.1 GENERAL REQUIREMENTS	25
6.2 PRINCIPAL CONTENTS	25
SECTION 7 MARKING	
26	
SECTION 8 EVALUATION OF CONFORMITY	
8.1 DECLARATION	27
8.2 PROVISION OF SPECIFICATIONS	27
APPENDICES	
A PARTIAL SAFETY FACTORS	28
B RELATIONSHIP BETWEEN LOADS AND RESISTANCE	29
C DETERMINATION OF EARTH PRESSURES AND STRUT LOADS USING EMPIRICAL PRESSURE ENVELOPES	30
D TYPICAL GROUND PARAMETERS	32
E ADDITIONAL LOADS	33

FOREWORD

Shoring and trench lining systems are intended for use in temporary works to protect the workers and the works from the effects of any trench collapse.

This Standard covers steel shoring and trench lining equipment because most shoring systems in use are steel. Very few shoring systems in the industry are made of other materials like wood, aluminium and fibreglass and, because such systems behave so differently to steel and require different design considerations, they were considered to be a different topic. Thus, shoring systems made of other materials were excluded from the Scope of this Standard to expedite the publication of this document.

STANDARDS AUSTRALIA

Australian Standard
Steel shoring and trench lining equipment

Part 1: Design

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the requirements for steel shoring and trench lining systems assembled completely from prefabricated components. It includes requirements for the design, construction and intended use of such systems.

1.2 APPLICATION

This Standard applies to all new shoring and trench lining systems. All systems shall comply with this Standard within 24 months of the publication date of this Standard.

1.3 GENERAL

Trench lining systems are intended for use in temporary works to protect workers and the works from the effects of any trench collapse or ground movement or both.

Drawings presented in this Standard are for illustrative purposes and are not intended for use as engineering drawings.

Manufacturers shall keep up to date records of all trench lining system components that have been manufactured and shall keep records of conformity of materials used.

1.4 NEW DESIGNS AND INNOVATIONS

This Standard is not intended to preclude novel materials, designs and the like, which do not comply with this Standard or are not mentioned in it but which can be shown to give equivalent or superior results.

1.5 REFERENCED DOCUMENTS

AS

- 1163 Structural steel hollow sections
- 3679 Structural steel
- 3679.2 Part 2: Hot-rolled steel bars and sections
- 4100 Steel structures
- 1726 Geotechnical site investigation

AS/NZS

- 1594 Hot-rolled steel flat products