AS 4744.1:2025

Australian STANDARD®

STANDARDS Australia

Shoring and trench lining

Part 1: Design



AS 4744.1:2025

This Australian Standard® was prepared by ME-082, Shoring and Trench Lining. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 07 March 2025.

This Standard was published on 21 March 2025.

The following are represented on Committee ME-082:

Australian Institute Of Health & Safety
Civil Contractors Federation
Concrete Pipe Association Of Australasia
Engineers Australia
Institute Of Public Works Engineering Australasia
Monash University
Victorian Workcover Authority (Worksafe Victoria)

This Standard was issued in draft form for comment as DR AS 4744.1:2024.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:
www.standards.org.au

ISBN 978 1 76175 125 7

Shoring and trench lining

Part 1: Design

Originated as AS 4744.1—2000.
Second edition 2025.

© Standards Australia Limited 2025

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, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee ME-082, Shoring and Trench Lining, to supersede AS 4744.1—2000, *Steel shoring and trench lining equipment, Part 1: Design*.

This document specifies requirements for the safe design and rating of steel and aluminium shoring and trench lining equipment assembled completely from prefabricated components for use in excavation operations in order to protect persons, the works and adjoining areas or infrastructure from the effects of any instability of the excavated soil face and/or adjacent *in situ* soils from movement or collapse.

The major changes in this edition are as follows:

(a) Shoring and trench lining equipment designated ratings utilizing maximum rated (working) load capacities (e_k) rather than characteristic system resistance (R_k).

(b) Shoring and trench lining equipment rated (working) load capacities (e_k) to be determined based on both a uniformly distributed load and a triangularly distributed load with maximum pressure at the base of the panel.

(c) Elastic panel deflection (Δ) based on rated (working) load capacities (e_k) to be declared for both uniformly distributed load and triangularly distributed load with maximum pressure at the base of the panel and the requirement for a maximum deflection of L/60 relaxed.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

© Standards Australia Limited 2025

Contents

Preface ii

Introduction v

Section 1 Scope and general 1
1.1 Scope 1
1.2 Normative references 1
1.3 Terms and definitions 1
1.4 New designs and innovations 4
1.5 Symbols and abbreviated terms 4

Section 2 System and components — Description and examples 6
2.1 Common trench lining systems 6
2.1.1 Trench boxes 6
2.1.2 Slide rail 7
2.1.3 Drag box 9
2.2 Supporting components 9
2.2.1 Strut 9
2.2.2 Extension units 11
2.2.3 Post 11
2.2.4 Pins 11
2.3 Strut to panel and slide rail connection 11
2.3.1 Articulated connection 11
2.3.2 Clearance only connection 11
2.3.3 Fully restrained connection 12
2.4 Panel to panel connections 12
2.4.1 Separate panel connector with pins 12
2.4.2 Integral panel connector with pin 13

Section 3 Designation 14
3.1 General 14
3.2 Trench box designation 14
3.3 Panel designation 14
3.4 Strut designation 14
3.5 Slide rail post designation 15

Section 4 Materials 16

Section 5 Design requirements 17
5.1 General requirements 17
5.2 Minimum rated trench box capacity 18
5.3 Maximum elastic deflection 18
5.4 Attachment points 19
5.4.1 General 19
5.4.2 Extraction points 19
5.4.3 Handling points 19
5.4.4 Slide rail posts 20
5.4.5 Extraction, lifting and handling point positioning 20
5.4.6 Extraction, connecting and pulling point design criteria 20
5.4.7 Drag box pulling point design criteria 20
5.4.8 Design criteria for lifting and handling points 20
5.4.9 Location of lifting and handling points 20
5.5 Struts 20
5.5.1 General 20
5.5.2 Minimum strut partial safety factor for action 21
5.5.3 Strut technical requirements 21
5.5.4 Strut connection 23
5.5.5 Strut component connection 23

5.5.6 Drag box leading strut 23
5.6 Strut to panel or slide rail connection 24
5.6.1 Vertical strut to panel rotation 24
5.6.2 Horizontal strut to panel rotation 24
5.6.3 Drag box connections 24
5.6.4 Strut to panel/slide rail connections 24

Section 6 Instruction manual 25
6.1 General requirements 25
6.2 Principal and supplementary contents 25
6.2.1 Principal contents 25
6.2.2 Supplementary contents 25

Section 7 Marking 27

Section 8 Evaluation of conformity 28
8.1 Declaration 28
8.2 Provision of specifications 28

Appendix A (normative) **Partial safety factors 29**

Appendix B (informative) **Relationship between loads and resistance 30**

Appendix C (informative) **Determination of earth pressure envelopes 31**

Appendix D (informative) **Typical soil parameters 33**

Appendix E (informative) **Additional loads 35**

Bibliography 38

Introduction

Shoring and trench lining equipment is intended for use in temporary works to protect persons, the works and adjoining areas or infrastructure from the effects of instability of the excavated soil face and/or adjacent *in situ* soils from movement or collapse.

The purpose of this document is to provide guidance on the design of modular steel and aluminium shoring and trench lining equipment, which are the most common types of prefabricated shoring systems in use. Other materials, such as wood, composites and fibreglass, etc are not covered in this document because they have different material properties and design requirements than either steel or aluminium.

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

© Standards Australia Limited 2025

NOTES

Australian Standard®

Shoring and trench lining

Part 1: Design

Section 1 Scope and general

1.1 Scope

This document specifies requirements for the design, intended use and rating of steel and aluminium shoring and trench lining equipment assembled completely from prefabricated components for use in excavation operations. The purpose of this document is to protect persons, the works and adjoining areas or infrastructure from the effects of any instability of the excavated soil face and/or adjacent *in situ* soils from movement or collapse.

Prefabricated shoring equipment made of other materials were excluded from the scope of this document.

This document does not address the requirements for excavation ingress or egress and the associated safety elements of excavation protection systems to prevent falls or for the rescue of workers. Understanding those requirements can maximize their adoption, where practical, in shoring and trench lining equipment design. The designer is referred to the relevant Australian Standards for the specific requirements to be addressed in these matters (see Bibliography).

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 4100, *Steel structures*

AS/NZS 1163, *Cold-formed structural steel hollow sections*

AS/NZS 1554.1, *Structural steel welding, Part 1: Welding of steel structures*

AS/NZS 1594, *Hot-rolled steel flat products*

AS/NZS 1664.1, *Aluminium structures, Part 1: Limit state design*

AS/NZS 1665, *Welding of aluminium structures*

AS/NZS 3597, *Structural and pressure vessel steel — Quenched and tempered plate*

AS/NZS 3678, *Structural steel—Hot-rolled plates, floorplates and slabs*

AS/NZS 3679.1, *Structural steel, Part 1: Hot-rolled bars and sections*

AS/NZS 4600, *Cold-formed steel structures*

1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

© Standards Australia Limited 2025