

Railway Infrastructure - Sighting



Infrastructure Standard



🕥 rissb.



This Australian Standard® AS 7631 Railway Infrastructure - Sighting was prepared by a RISSB Development Group consisting of representatives from the following organisations:

Transport for NSW, CMT Solutions Queensland Rail

RISSB

Rio Tinto ARTC Pacific National Brookfield Rail Opus Rail

The Standard was approved by the Development Group and the Infrastructure Standing Committee in November, 2015. On November 23, 2015 the RISSB Board approved the Standard for release.

This standard was issued for public consultation and was independently validated before being approved.

Development of the standard was undertaken in accordance with RISSB's accredited process. As part of the approval process, the Standing Committee verified that proper process was followed in developing the standard.

RISSB wishes to acknowledge the positive contribution of subject matter experts in the development of this standard. Their efforts ranged from membership of the Development Group through to individuals providing comment on a draft of the standard during the open review.

I commend this standard to the Australasian Rail Industry as it represents industry good practice and has been developed through a rigorous process.

Paul Daly Chief Executive Officer Rail Industry Safety and Standards Board

Keeping Standards up-to-date

Australian Standards developed by RISSB are living documents that reflect progress in science, technology and systems. To maintain their currency, Standards are reviewed every seven years, and new editions are published. Between editions, amendments may be issued. Australian Standards developed by RISSB may also be withdrawn.

It is important that readers assure themselves they are using a current RISSB Standard, which should include any amendments that may have been issued since the Standard was published. Information about Australian Standards developed by RISSB, including amendments, can be found by visiting <u>www.rissb.com.au</u>

RISSB welcomes suggestions for improvements, and asks readers to notify us immediately of any apparent inaccuracies or ambiguities. Members are encouraged to use the change request feature of the RISSB website at: http://www.rissb.com.au/products/. Otherwise, please contact us via email at rissb@rissb.com.au or write to Rail Industry Safety and Standards Board, PO Box 4271, Kingston, ACT 2604.

AS 7631:2015

Railway Infrastructure - Sighting

Document Details

First published as: AS 7631 Railway Infrastructure Sighting

ISBN 978-1-76035-382-7

Published by Rail Industry Safety and Standards Board (RISSB) ABN: 58 105 001 465 PO Box 4271, Kingston, ACT, Australia 2604

Copyright

©RISSB

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 RISSB, unless otherwise permitted under the Copyright Act 1968.

Notice to Users

This RISSB product has been developed using input from rail experts from across the rail industry and represents good practice for the industry. The reliance upon or manner of use of this RISSB product is the sole responsibility of the user who is to assess whether it meets their organisation's operational environment and risk profile.



Document Control

Document Title			
AS 7631:2015 Railway	Infrastructure - Sighting		
Document History	y		
Publication Version	Effective Date	Reason for and Exter	nt of Change(s)
2015	November 23, 2015	First release	
		- 0.	
Approval		X	
Name			Date
Rail Industry Safety and	I Standards Board (RISSB)		23/11/2015
JIM ON	nrost	e	



Contents

		interits		
	1	Introduc	tion	6
		1.1	Purpose	6
		1.2	Scope	6
		1.3	Compliance	7
		1.4	Referenced documents	7
		1.5	Definitions	
		1.6	Abbreviations	8
	2	Sighting	process	9
		2.1	General	9
		2.2	Perception-reaction framework	9
		2.2.1	Perception-reaction time	9
		2.3	Perception: vigilance and detection	
		2.3.1	Vigilance on approach	10
		2.3.2	Detection	10
		2.3.3	Visibility factors and viewing conditions	10
		2.3.4	Attention / parallel distraction factors	
		2.3.5	Visual acuity factors.	11
		2.3.6	Field of vision	
		2.3.7	Colour perception	
		2.3.8	Glare	
		2.4	Recognition	14
		2.5	Interpretation	14
		2.6	Response selection	14
		2.7	Visual aids and auxiliary devices	14
	3	Sighting	of railway signs	15
		3.1	General	
		3.2	Perception-reaction for railway infrastructure signs	16
		3.2.1	Dark adaptation	16
		3.2.2	Visibility	16
		3.2.3	Close visibility	17
	U	3.2.4	Attention / Parallel distraction factors	17
		3.2.5	Peripheral vision	17
		3.2.6	Recognition with track layout factors	17
		3.2.7	Colour and symbol recognition	17
		3.2.8	Criticality and depth of processing required	
		3.3	Minimum perception-reaction time	
		3.4	Non-compliance	19
	4	Sighting	hazards	19



Appendix Contents

RISSB D

Appendix A	Sequential Processing	20
Appendix B	Calculation of required letter sizes and viewing distances using visual acuity factors.	21
B.1	Example of simple calculation for use as guideline2	21
Appendix C	Calculation of sight distance chart	23
C.1	Example calculation:	24
Appendix D	Hazards	24

Shuten Presien

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

1 Introduction

1.1 Purpose

This document is to provide a framework to assess the optimal sighting arrangements in order to minimise risks as a consequence of poor sighting on the railway network.

The documentation may be used to facilitate the optimisation of sighting and *perceptionreaction* which are considered important safety factors in the mitigation of railway safety risks associated with:

- (a) the occurrence of an exceedance of authority from incorrectly placed signs
- (b) the occurrence of reading the incorrect sign, for example read-through and read-across errors
- (c) railway and contract personnel working in the rail corridor
- (d) authorised visitors to the corridor
- (e) machinery and plant being used on the corridor.

While this standard was developed for AS 7631 compliance, the process can be used for compliance with any standards.

If applied as intended, the framework provided in this Standard will affect the implementation of the appropriate mitigation measures to overcome or minimise the safety risks associated with poor sighting arrangements; thereby increasing safety of operations and people.

1.2 Scope

This Standard covers rail networks as classified in AS 7630 Railway Infrastructure - Track Classification.

This Standard is not specifically intended to cover urban on-street tramway or light rail networks, cane railways, or heritage railways operating on private reservation, but items from this Standard may be applied to such systems as deemed appropriate by the relevant *Rail Infrastructure Manager*.

This Standard provides a number of environmental, physical and human factor considerations which will assist the *Rail Infrastructure Manager* in the understanding of sighting processing, constraints and requirements.

This Standard aims to provide a sound framework for the development and implementation of optimal sighting arrangements for all stimuli on the railway where it is critical that a person/s shall perceive, interpret and act upon a *stimulus* in a safe and controlled manner.

A stimulus can be a:

- (a) sign
- (b) signal
- (c) intermittent hazard such as could occur on an unauthorised crossing of the railway, track workers, livestock on the track, etc.

Where appropriate this Standard is intended to be used in conjunction with:

- (a) AS 7632 Railway Infrastructure Signage
- (b) AS 7721 Railway Signals, Indicators and Signage