



AUSTRALIAN RAIL INDUSTRY
STANDARDS ORGANISATION

AS 7634
Railway Infrastructure Survey

AS 7634
STANDARDS



Advancing safety and productivity

Notice to users

This ARISO 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 ARISO product is the sole responsibility of the user who is to assess whether it meets their organisation's operational environment and risk profile.

Development of this Standard was prepared by an Australian Rail Industry Standards Organisation (ARISO) Development Group consisting of representatives from the following organisations:

DTP VIC, Hitachi Rail, Jacobs, Monteath & Powys, Queensland Rail, Sydney Trains, TfNSW, and WSP.

The Infrastructure Standing Committee verified that ARISO's accredited process was followed in developing the product, before the ARISO Board approved the document for publication.

ARISO 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 comments 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.



Alan Fedda
Chief Executive Officer
Australian Rail Industry Standards Organisation

Keeping ARISO products up-to-date

Products developed by ARISO are living documents that reflect progress in science, technology and systems. To maintain their currency, ARISO products are periodically reviewed, and new editions published when required. Between editions, amendments may be issued. Products developed by ARISO could also be withdrawn.

It is important that readers assure themselves that the ARISO product they are using is current, including any amendments that have been issued since the product was published. Information about ARISO products, including amendments, can be found by visiting www.ariso.org.au

ARISO 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 ARISO website at: <http://www.ariso.org.au/products>. Otherwise, please contact us via email at info@ariso.org.au or write to Australian Rail Industry Standards Organisation, GPO Box 1267, Brisbane QLD 4000, Australia.

Document details

First published as: AS 7634:2017

ISBN: 978 1 76175 500 2

Document history

Publication Version	Effective Date	Reason for and Extent of Change(s)
2025	24 December 2025	This document has been reviewed to ensure it remains relevant and applicable. The latest review assessed the content, confirming that while updates were made to align with current industry practices, technologies, and regulatory requirements, the original authorship and copyright have been acknowledged as required.

Approval

Name	Date
Australian Rail Industry Standards Organisation	27 November 2025

Copyright

© ARISO

All rights are reserved. No part of this work can be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of ARISO, unless otherwise permitted under the Copyright Act 1968.

Published by the Australian Rail Industry Standards Organisation, GPO Box 1267, Brisbane QLD 4000, Australia.

Preface

This Standard was prepared by the Railway Infrastructure Survey Development Group, overseen by the ARISO Infrastructure Standing Committee.

The major changes in this edition are as follows:

- (a) Removal of requirements pertaining to non-NGRS survey.
- (b) Modernized the reference materials.
- (c) Addition of identified hazards which this Standard aims to control.

Objective

The objective of this Standard is to:

- (a) specify requirements relating to the design, construction, measurement, maintenance and monitoring of a railway survey system, to be able to support various engineering activities undertaken within, and applicable to a modern railway environment;
- (b) achieve a standardized approach to the provision of railway engineering surveying; and
- (c) provide mandatory and recommended guidance so that the rail survey system developed is aligned with the safe operation of the railway network, in accordance with the requirements of Rail Safety National Law.

Compliance

There are four types of provisions contained within Australian Standards developed by ARISO:

- (a) Requirements.
- (b) Recommendations.
- (c) Permissions.
- (d) Constraints.

Requirements – it is mandatory to follow all requirements to claim full compliance with the Standard. Requirements are identified within the text by the term ‘shall’.

Recommendations – do not mention or exclude other possibilities but do offer the one that is preferred. Recommendations are identified within the text by the term ‘should’.

Recommendations recognize that there could be limitations to the universal application of the control, i.e. the identified control is not able to be applied, or other controls are more appropriate or better.

For compliance purposes, where a recommended control is not applied as written in the standard it could be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk as part of their WHS or Rail Safety National Law obligations. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities or interfacing organisations where the risk may be shared.

Permissions – conveys consent by providing an allowable option. Permissions are identified within the text by the term ‘may’.

Constraints – provided by an external source such as legislation. Constraints are identified within the text by the term ‘must’.

ARISO Standards address known hazards within the railway industry. Hazards, and clauses within this Standard that address those hazards, are listed in Appendix A.

Appendices in ARISO Standards may be designated either "normative" or "informative". A "normative" appendix is an integral part of a Standard and compliance with it is a requirement, whereas an "informative" appendix is only for information and guidance.

Commentary

Commentary C Preface

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by 'C' preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

AS 7634 PREVIEW ONLY

Table of Contents

Section 1	Scope and general	7
1.1	Scope	7
1.2	Normative references	7
1.3	Defined terms and abbreviations.....	7
Section 2	Planning.....	12
2.1	Railway survey system	12
2.2	Competency	12
2.3	Strategy	12
2.4	Categories of railway survey systems	13
2.4.1	National Geospatial Reference System.....	13
2.5	Instrumentation, tools and equipment.....	13
2.5.1	Specialized tools and equipment	13
2.5.2	Instrumentation and observational techniques.....	14
Section 3	Implementation	16
3.1	Application of the rail survey control network	16
3.2	Rail survey control marks	16
3.3	Placement of rail survey control marks	16
3.4	Installation of rail survey control marks.....	17
3.5	Application of the track control or monument network	17
3.5.1	General	17
3.5.2	Track control marks.....	18
3.5.3	Placement of track control marks	18
3.6	Survey mark identification requirements	19
3.6.1	Coordinated survey networks	19
Section 4	Deliverables	20
4.1	Coordinated survey networks	20
4.1.1	Reporting.....	20
4.1.2	Observational deliverables.....	20
Section 5	Data management and quality assurance	20
5.1	Survey data management system	20
5.2	Records management requirements – Coordinated networks	21
Appendix A	Hazard Register (Informative).....	22
Appendix B	Typical Railway Surveying Tasks (Informative)	23
Appendix C	Specialized Tools and Equipment used for Railway Surveying Purposes (Informative)	25
Appendix D	Different Types of Rail Survey Control Marks – Typical Examples (Informative)...	26
Appendix E	Examples of Track Control Marks, Monuments, Plaques, and Data Plates (Informative)	27

Appendix F Survey Class (informative)	28
Bibliography (Informative)	32

Figures

Appendix Figure C-1 Offset prism and associated attachment arms	25
Appendix Figure C-2 Right-angled offset prism being used to measure an SSP.....	25
Appendix Figure C-3 Platform coping tool.....	25
Appendix Figure C-4 Magnetic rail prism.....	25
Appendix Figure C-5 Track bar used to measure track centreline.....	25
Appendix Figure D-1 Brass triangle type mark, details.....	26
Appendix Figure D-2 Rail survey control marks	26
Appendix Figure D-3 Survey marks in cast iron cover boxes	26
Appendix Figure D-4 Other types of permanent survey control marks	26
Appendix Figure E-1 Brass bar and survey plaque.....	27
Appendix Figure E-2 Datum plate	27
Appendix Figure E-3 Track data plate	27
Appendix Figure E-4 SSP and survey plaque	27
Appendix Figure E-5 Brass bar TCM in platform.....	27
Appendix Figure E-6 Typical locations for TCMs.....	27
Appendix Figure E-7 Brass bar type survey mark	27
Appendix Figure E-8 Stainless steel pin type survey mark	27
Appendix Table F-1 – Survey Class (Relative Accuracy)	29

AS 1634 PREVIEW ONLY

Section 1 Scope and general

1.1 Scope

This document covers surveying systems for railways as defined under AS 7630.

This document is intended to cover railway survey systems based on the current National Geospatial Reference Systems (NGRS) for Australia and New Zealand. This document covers railway survey system requirements and promotes current good practice.

While non-NGRS surveys can still be present and relevant in the industry, NGRS is the preferred method for all future survey works being undertaken.

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

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:

- AS 7630, *Railway Infrastructure - Track Classification*
- *Geocentric Datum of Australia 2020 (GDA2020)*
- *Geocentric Datum of Australia 1994 (GDA94)*
- *New Zealand Geodetic Datum 2000 (NZGD2000)*
- *New Zealand Vertical Datum 2016 (NZVD2016)*
- *Australian Height Datum (AHD71)*
- *Australian Height Datum (Tasmania) 1983 (AHD-TAS83)*
- *ICSM Guideline for Conventional Traverse Surveys Special Publication 1 – version 2.2:2020*
- *ICSM Guideline for Control Surveys by Differential Levelling Special Publication 1 – version 2.2:2020*
- *ICSM Guideline for Control Surveys by GNSS Special Publication 1 – version 2.2:2020*

NOTE:

Documents for informative purposes are listed in a Bibliography at the back of the Standard.

1.3 Defined terms and abbreviations

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

1.3.1

Australian Height Datum (AHD)

current official national vertical datum for Australia

Note 1 to entry: From measurements taken in the late 1960s at 30 tide gauges around the mainland, and 2 tide gauges around Tasmania, 0.000 m AHD was assigned to the mean sea level of these results.

Note 2 to entry: Referred to as Australian Height Datum 1971 (AHD71) and Australian Height Datum (Tasmania) 1983 (AHD-TAS83)