

RISSB

RAIL INDUSTRY SAFETY AND STANDARDS BOARD

STANDARDS

AS 7637

Hydrology and Hydraulics



**Australian
STANDARD**

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ARC Infrastructure, ARTC, DTP VIC, Mott MacDonald, Queensland Rail, Transport for NSW

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

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 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
Rail Industry Safety and Standards Board

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Approval

Name	Date
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Preface

The aim of this Standard is to describe the hydrological and hydraulic requirements (i.e. functions, performance, design constraints and risk attributes) for the design and assessment of railway infrastructure in relation to whole-of-life approach to the management of hydrological and hydraulic design. This approach includes the requirements in relation to hydrological and hydraulic requirements and considers the design, supply, construction and maintenance of track in relation to drainage and flood-prone areas for a range of operational track gauges used in Australia.

All RISSB standards provide controls for hazards contained in RISSB's hazard register. In this standard, the reference number of the hazard being addressed is identified in Appendix A. RISSB's hazard register can be found on the RISSB website at www.rissb.com.au.

This standard was prepared by the Hydrology and Hydraulics Development Group, overseen by the RISSB Infrastructure Standing Committee.

Objective

This Standard describes the hydrological and hydraulic functions, performance, design constraints and risk attributes for the design and assessment of railway infrastructure in relation to all forms of drainage in stormwater management.

This Standard is intended to govern public and private railways and railway drainage systems on a whole of life basis and any other drainage related work affecting the rail corridor.

The main purpose of this Standard is to provide a framework that promotes consistency and efficiency in design, construction, commissioning, maintenance, monitoring and decommissioning of track drainage and waterway crossings.

This Standard includes the hydraulic design of surface and sub-surface drainage systems including river and floodway crossings, culverts, pipes, channels, pits and grates.

This Standard aims to provide requirements to support in improving flood event resilience for rail corridor infrastructure. Generally, this involves a combination of flood mitigation, emergency management, flood forecasting and warning measures, land-use planning and infrastructure design.

Compliance

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

- (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.

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'.

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.

RISSB 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 RISSB 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.

Table of Contents

Section 1	Scope and general.....	8
1.1	Scope	8
1.2	Normative references	8
1.3	Defined terms and abbreviations.....	9
Section 2	Flood impact management.....	15
2.1	Overview	15
2.2	Flood management plan	16
2.2.1	General.....	16
2.2.2	Flood hazard identification and risk mitigation	16
2.3	Flood emergency response plan	17
Section 3	Flood and drainage design.....	18
3.1	Hydrological assessment.....	18
3.1.1	General.....	18
3.1.2	Identification of study area (hydraulic model extent)	19
3.1.3	Definition of catchment area	19
3.1.4	Hydrological computational method	19
3.1.5	Selection of design events.....	20
3.1.6	Hydrologic model verification, calibration and validation	21
3.1.7	Climate change.....	21
3.2	Hydraulic assessment.....	22
3.2.1	General.....	22
3.2.2	Selection of hydraulic computational process	22
3.2.3	Hydraulic model calibration and validation	22
3.2.4	Hydraulic model sensitivity analysis.....	22
3.3	Hydraulic criteria for design assessment	23
3.3.1	General.....	23
3.3.2	Afflux	23
3.3.3	Velocity.....	23
3.3.4	Scour.....	24
3.3.5	Hydraulic gradient.....	24
3.3.6	Tailwater level	24
3.3.7	Headwater Level.....	25
3.3.8	Flood hazard.....	25
3.3.9	Blockage	25
3.4	Hydraulic design and risk mitigation.....	25
3.4.1	General.....	25
3.4.2	General requirements	25
3.5	Drainage types	26
3.5.1	General.....	26
3.5.2	Factors affecting selection of waterway crossings and drainage infrastructure	27

3.5.3	Longitudinal open channel (surface) track drainage.....	27
3.5.4	Longitudinal underground track drainage	28
3.5.5	Cross-drainage.....	29
3.5.6	Sub-soil drainage.....	31
3.5.7	Sacrificial low point	31
3.5.8	Diversion drains and levees.....	32
3.6	Standards of service	33
3.6.1	General requirements	33
3.6.2	By infrastructure type	34
3.6.3	Level of service for existing infrastructure.....	36
3.6.4	Climate change.....	36
Section 4	Inspection, monitoring and maintenance	37
4.1	Inspections and monitoring	37
4.1.1	General.....	37
4.1.2	Inspection overview	37
4.1.3	General asset inspections	37
4.1.4	General structure asset hydraulic inspections.....	38
4.1.5	Flood response inspection	39
4.1.6	Track flood patrol inspections.....	39
4.1.7	Special inspections	40
4.1.8	Monitoring at flood-prone locations.....	40
4.1.9	Remote flood monitoring.....	40
4.1.10	Flood monitoring – Hazard locations	41
4.2	Commissioning of monitoring systems	41
4.3	Record keeping.....	41
4.4	Maintenance	42
4.4.1	Maintenance of waterways and drainage systems.....	42
4.4.2	Adjacent drainage systems owned by other organizations	42
4.5	Assessment and actions	42
4.5.1	General.....	42
4.5.2	Decommissioning and disposal	43
Appendix A	Hazard Register	44
Appendix B	Definitions	45
Appendix C	Flood Risk Management Framework	50
Appendix D	Project Phases and Hydrological Investigations (Informative)	51
	Bibliography (Informative)	52

Figures

Appendix Figure B-1 Rail corridor and hydrological components	46
Appendix Figure B-2 Afflux	47
Appendix Figure B-3 Cross drainage	47
Appendix Figure B-4 Mitre drain.....	48
Appendix Figure B-5 Catch drain and cess drain	48
Appendix Figure B-6 Floodplain	49
Appendix Figure C-1 Flood risk management framework	50

Tables

Appendix Table B-1 Annual Exceedance Probability (Terminology 1.3.2).....	45
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Section 1 Scope and general

1.1 Scope

The scope of this Standard covers hydrological and hydraulic risk management and requirements for construction of new railways, risk assessment and modifications to existing rail corridors and maintenance activities. Requirements of this standard include:

- (a) alignment to federal flood risk management frameworks in the development of flood management plans for rail corridor infrastructure for the impact of flood related events;
- (b) hydrological and hydraulic design principles and requirements to improve resilience in drainage and stability of the track formation, supporting embankments, associated cuttings, tunnel and bridge structures and access roads adjacent to the track; and
- (c) hydraulic design and hydrology factors throughout the life of the corridor infrastructure including construction, operational monitoring and maintenance service levels and decommissioning.

This Standard covers the management of surface run off only, through either above or underground drainage systems. It is not intended to cover the management of ground water flows (i.e. hydrogeology).

While this Standard does not cover all hydrological or hydraulic circumstances, or address the impacts of hail and snow, the scope includes both surface and underground drainage requirements arising within the railway corridor as well as similar needs arising from the interface with natural waterways along the corridor.

This Standard applies to freight and passenger rail networks as classified in AS 7630.

This Standard is not intended to cover urban on-street tramway or light rail networks, monorail, 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 (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*
- AS 7636, *Railway Infrastructure - Railway Structures*
- AS 7640, *Rail Management*
- *RISSB Guideline Rail Emergency Management Planning*
- *Australian Disaster Resilience Handbook 7, Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia*
- *Australian Disaster Resilience Handbook Collection, Flood Emergency Planning for Disaster Resilience*
- *Austroads Guide to Bridge Technology Part 8: Hydraulic Design of Waterway Structures*
- *Austroads Guide to Road Design Part 5: Drainage – General and Hydrology Considerations*
- *Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia*