

## Information for users

To access individual modules referenced within this standard, blue active links are provided from the relevant index pages where these are listed. Clicking on a specific reference will lead to the corresponding document. Please ensure to open **bookmarks** for easier navigation within the document and to access **index of modules**.

Alternatively, you may use the search facility to search for a specific document by using the complete document reference number – such as NR/L3/SIG/30082/002 – in the search field.

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HISTORICAL

Reference	NR/L3/CIV/005
Issue	2
Publication date	4 <sup>th</sup> June 2011
Compliance date	3 <sup>rd</sup> September 2011

## Level 3

# Railway Drainage Systems Manual Contents

### Endorsement and Authorisation

Endorsed by:

  
.....

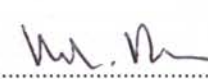
J. Dora, Working Party Chair

Authorised by:

  
.....

A. Jones, Professional Head [Track]

Authorised by:

  
.....

N. Ricketts, Professional Head [Buildings & Civil Engineering]

Accepted for issue by:

  
.....

M. McManus, National Standards Manager

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## Issue Record

Issue	Date	Comments
1	December 2010	New standard.
2	June 2011	Updated to reference the issue of Part 5

## Compliance

This Network Rail standard includes mandatory requirements that shall be complied with by Network Rail and its contractors from 3<sup>rd</sup> September 2011 except:

- The national prioritisation system to prioritise Drainage Remediation and Drainage Maintenance is to be developed by 30<sup>th</sup> June 2011.
- The Initial Survey and condition assessment shall be completed by 31<sup>st</sup> March 2014.
- The Drainage Asset Register shall be completed by 31<sup>st</sup> March 2014.
- The prioritised programme for developing Drainage Management Plans shall be issued by 31<sup>st</sup> March 2014.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

## Reference documentation

Network Rail standards	
NR/CS/CIV/044	Managing Structures Works
RT/CE/S/003	Technical Approval of design, construction and maintenance of Civil Engineering Infrastructure
NR/L2/MTC/088	Arrangements for maintenance of new and changed assets
NR/L2/TRK/001/001	Inspection and maintenance of permanent way - geometry and gauge clearance
NR/L2/TRK/2500	Technical Approval in the Design of Track Infrastructure
NR/L3/CIV/008/3A	Handbook for the examination of Structures: Part 3A: Culverts
NR/PRC/MPI/CI0058	Controlling the risk of earthwork instability during MP&I 'Civils' excavation works
RT/CE/S/044	Design & Construction of Undertrack Crossings
NR/SP/TRK/9039	Formation Treatments
RT/CE/S/010	Geotextiles

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Other documents	
British Standards Institution	BS 1377-2: Methods of test for soils for civil engineering purposes. Classification tests (1990). BS EN 12620: Aggregates for concrete (2008).
Building Research Establishment	Digest 365: Soakaway design (2003 revision). Watford, UK.
Construction Industry Research and Information Association, London	Report C521: Sustainable Urban Drainage Systems. Design Manual for Scotland and Northern Ireland (2000). ISBN: 978-0-86017-521-6.
	Report C522: Sustainable Urban Drainage Systems. Design Manual for England and Wales (2000). ISBN: 978-0-86017-522-3.
	Report C643: The potential for water pollution from railways (2005). ISBN: 978-0-86017-643-5.
	Report C689: Culvert Design and Operation Guide (2010). ISBN: 978-0-86017-689-3.
	Report C697: The SUDS manual (2007). Woods-Ballard, B., Kellagher, R., et al. ISBN: 978-0-86017-697-8.
Environment Agency	The Trash Screen and Security Guide (2009). ISBN: 978-1-84911-138-6.
Environment Agency/Scottish Environment Protection Agency	PPG5: Works and maintenance in or near water
HMSO London	Reference Book 345: The design of field drainage pipe systems. Agricultural and Development Advisory Service, Land and Water Service (ADAS) (1982). Ministry of Agriculture, Fisheries and Food. ISBN: 0-11241-515-6.
	Report No. 5: Pipe size design for field drainage. Land Drainage Service (1980). Ministry of Agriculture, Fisheries and Food.
Institute for Hydrology, Wallingford	The Flood Estimation Handbook (1999). ISBN: 0-94854-089-3.
	Report 124: Flood estimation for small Catchments. Marshall, D.C.W and Bayliss, A.C (1994).
HR Wallingford	The Wallingford Procedure: Design and Analysis of urban Storm Drainage (1981).
McGraw-Hill	Erosion and sediment control handbook. Goldman, S J, Jackson K and Bursztynsky, T A (1986). ISBN: 0070236550, 62
NERC	Flood Studies Report. Natural Environment Research Council, Swindon (1975).
Thomas Telford, London	Tables for the hydraulic design of pipes, sewers and channels. HR Wallingford and Barr DIH, 8 <sup>th</sup> edition (2006).

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Publication date	4 <sup>th</sup> June 2011
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Other documents	
TRL	Report PPR341: Drainage of Earthwork Slopes. Carder, D.R., Watts, G.R.A., Campton, L. Motley, S (May 2008). ISBN 978-1-84608-763-3.
United State Department of Transportation, Washington D.C	Design of roadside channels. HDS 4 (1965)
	Hydraulic design of energy dissipators for Culverts and channels (2006). (HEC No. 14.) Federal Highway Administration; FHWA-NHI-06-86
USACE	Engineering and Design - Drainage and erosion control mobilization construction. Publication number EM 1110-3-136. (1984)

### Disclaimer

In issuing this document for its stated purpose, Network Rail makes no warranties, express or implied, that compliance with all or any documents it issues is sufficient on its own to ensure safe systems of work or operation. Users are reminded of their own duties under health and safety legislation.

### Supply

Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document will be available to Network Rail employees on request to the Document Controller and to other organisations from IHS (Technical Indexes Ltd) (01344 404409).

### Comments

The applicability and content of this standard will be reviewed on a regular basis. Written comments on the accuracy and utility of this standard will be taken into account when assessing the need for a new issue of the standard; such comments should be sent to the Senior Policy Development Specialist (Buildings & Civils) at 40 Melton Street, London NW1 2EE.

Reference	<b>NR/L3/CIV/005</b>
Issue	2
Publication date	4 <sup>th</sup> June 2011
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## Drainage Manual Contents

The following table identifies the Parts of the Drainage Manual, their issue number and publication date.

Reference	Title	Issue	Publication date
<a href="#">NR/L3/CIV/005/1</a>	Part 1: Purpose, scope and general management requirements	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/2A</a>	Part 2A: General design requirements	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/2B</a>	Part 2B: Hydraulic design of new Drainage Systems	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/2C</a>	Part 2C: Design of Drainage System components	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/2D</a>	Part 2D: Remediation	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/2E</a>	Part 2E: Installation	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/3A</a>	Part 3A: Inspection	1	4 <sup>th</sup> December 2010
<a href="#">NR/L3/CIV/005/3B</a>	Part 3B: Maintenance	1	4 <sup>th</sup> December 2010
NR/L3/CIV/005/4A	Part 4A: Initial Survey and condition assessment		
NR/L3/CIV/005/4B	Part 4B: Records		
<a href="#">NR/L3/CIV/005/5</a>	Part 5: Drainage Management Plans	1	4 <sup>th</sup> June 2011

## Standards Briefing Note

<b>Ref:</b> NR/L3/CIV/005	<b>Issue:</b> 2
<b>Title:</b> Railway Drainage Systems Manual	
<b>Publication Date:</b> 04/06/2011	<b>Compliance Date:</b> 03/09/2011
<b>Standard Owner:</b> Nigel Ricketts, Professional Head (Buildings & Civils)	
<b>Non-Compliance rep (NRNC):</b> Senior Project Development Specialist, Ken Brady	
<b>Further information contact:</b> John Dora, Principal Engineer (Climate Change)	<b>Tel:</b> 020 7557 8987

### Purpose

This Manual has been issued to (a) promote a coordinated approach to the management of railway Drainage Systems, and (b) develop improved asset knowledge of such systems.

The purpose of this Manual is to define the requirements and provide recommendations for:

- The management of Drainage Systems (Part 1).
- The design and installation of Drainage Systems (Part 2).
- The Inspection and Maintenance of Drainage Systems (Part 3).
- Recording information on Drainage Systems (Part 4).
- Drainage Management Plans (Part 5).

This Manual gives guidance on procedures for identifying risks, assigning priorities, and determining measures to be taken to maintain safety and reduce performance loss attributable to defective Drainage Systems.

The Manual provides guidance to those persons who have responsibility for locating, assessing, maintaining and improving the condition and effectiveness of Track Drainage and Off-track Drainage (collectively termed railway Drainage Systems).

### Scope

This Manual applies to Drainage Systems that are owned and/or managed by Network Rail used for draining:

- the Track Support System;
- Earthworks and other off-track Catchments; and
- below the track level in Tunnels.

Other than at their interfaces, this Manual does not apply to:

- Operational Property Drainage Systems, and
- Drainage Systems for Bridges, Tunnels and retaining structures that are managed as part of the structure.

This Manual can also apply to Drainage Systems abutting, feeding or receiving flow to or from railway Drainage Systems, and those that cross Network Rail infrastructure.

### What's New/ What's Changed and Why:

A new Part 5 of the Manual has been produced.

Part 5 provides direction and guidance on the production and updating of Drainage Management Plans (DMPs). The purpose of a DMP is to outline the drainage management strategy for achieving prescribed levels of service for a Drainage System. A DMP forms a long-term, cross-functional plan that aims to minimise adverse impact on safety and performance, identify future investment, and coordinate activities to achieve efficient delivery of Drainage Works.

The Content part of the Manual has been updated to reflect the issue of Part 5.

### Affected documents:

*Reference*

NR/L3/CIV/005 ISSUE 1

*Impact*

Superseded

**Briefing requirements:** Where Technical briefing (T) is required, the specific Post title is indicated. These posts have specific responsibilities within this standard and receive briefing as part of the Implementation Programme. For Awareness briefing (A) the Post title is not mandatory.

Please see <http://ccms2.hiav.networkrail.co.uk/webtop/drl/objectid/09013b5b804504da> for guidance.

Briefing <small>(A-Awareness/ T-Technical)</small>	Post	Team	Function
A	Route Asset Manager [Track]	Track Asset Management	Asset Management
A	Route Geotechnical Engineers	Civils Asset Management [Geotechnical]	Asset Management [Buildings & Civils]
A	Senior Renewals and Enhancement Engineers [Track]; Renewals and Enhancement Engineers [Track]	Track Asset Management	Asset Management
A	Track Maintenance Engineers, Section Managers [Track]; Section Managers (Off track)	Delivery Unit	Infrastructure Maintenance
T	Drainage Engineers	Civils Asset Management [Geotechnical]	Asset Management [Buildings & Civils]
T	Project Manager	National drainage survey	Investment Projects

\*NOTE: Contractors are responsible for arranging and undertaking their own Technical and Awareness Briefings in accordance with their own processes and procedure