

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

Level 2

Wood Sleepers, Bearers and Longitudinal Timbers

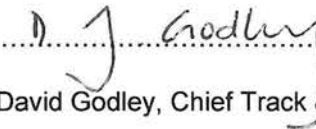
Endorsement and Authorisation

Endorsed by:



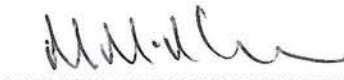
Gareth Evans, Working Group Chair

Authorised by:



David Godley, Chief Track & Lineside Engineer

Accepted for issue by:



Mick McManus, Principal Standards & Controls Manager

This document is the property of Network Rail. It shall not be reproduced in whole or part nor disclosed to a third party without the written permission of Network Rail.
© Copyright 2015 Network Rail.

Uncontrolled copy once printed from its electronic source.

Published and Issued by Network Rail, 2nd Floor, One Eversholt Street, London, NW1 2DN.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *No variations, could stop the railway*

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if variations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – *Controlled variations, approved risk analysis and mitigation*

- **Amber requirements shall** be complied with unless variation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Variations **may** be permitted. Variations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** variations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – *Guidance*

- Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.
- Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

Issue record

Issue	Date	Comments
1	Dec 1996	New specification
1A	Apr 1998	Minor rewording, including addition of further permitted species. Correction of bearer depth. Date marking to be if required by purchaser
2	Oct 1999	Certification of timbers sources; inclusion of limits on inbark (omitted in error); addition of further permitted species
3	Feb 2000	Supercedes RT/CE/S/031; incorporation of softwood requirements (from RT/CE/S/031); minor changes to eliminate anomalies between softwood and hardwood
4	Dec 2005	Minor text changes/additions and introduction of serviceable materials. Change in document number.
5	September 2015	Specification updated throughout to align with European standards where appropriate, including updates to the following sections: Standard references, definitions, species selection and certification, defects and quality requirements, durability and preservation and marking.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 05 December 2015.

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

BS EN 252:2014	Field test method for determining the relative protective effectiveness of a wood preservative in ground contact
BS EN 335-1:2007	Durability of wood and wood-based products - Preservative-treated solid wood - Part 1: Classification of preservative penetration and retention
BS EN 338:2009	Structural timber – Strength classes

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

BS EN 350 Part 2:1994	Durability of wood and wood-based products – Natural durability of solid wood – Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe
BS EN 351-1:2007	Durability of wood and wood-based products - Preservative-treated solid wood - Part 1: Classification of preservative penetration and retention
BS EN 599-1:2009+A1:2013	Durability of wood and wood-based products. Efficacy of preventive wood preservatives as determined by biological tests. Specification according to use class
BS 4978:2007 + A1:2011	Specification for visual strength grading of softwood
BS 8417:2011 + A1:201403	Preservation of wood. Code of Practice
BS EN 13145:2001 + A1:2011	Railway applications – Track – Wood sleepers and bearers
BS EN 13183-2:2002	Moisture content of timber Part 2: Estimation by electrical resistance measurement
BS EN 13991:2003	Derivatives from coal pyrolysis. Coal tar based oils. Creosotes. Specifications and test methods Convention on International Trade in Endangered Species EU Biocides Regulation 528/2012 (EU BPR) International Union for Conservation of Nature's Red List Network Rail Responsible Timber Sourcing Policy Statement Operational Control for the Implementation of the Responsible Timber Sourcing Policy The Creosote (Prohibition on Use and Marketing)(No. 2) Regulations 2003 UK Control of Pesticides Regulations (COPR) 1986
WPA Manual 2007	Wood Protection Association, Industrial Wood Preservation Specification and Practice 2007

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.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

Supply

Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document may be available to Network Rail people on request to the relevant controlled publication distributor. Other organisations may obtain copies of this from an approved distributor.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

Contents

1 Purpose	7
2 Scope	7
3 Definitions	7
4 Timber species certification	13
5 Sleepers and bearers – specific requirements	14
6 Longitudinal timbers – specific requirements	16
7 Defects and quality requirements	16
8 Moisture Content	20
9 Drilling	21
10 Durability and preservation	21
11 End strengthening using banding, gangnails or S-hooks	24
12 Marking	24
13 Delivery	24
14 Serviceable materials	25

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

1 Purpose

The purpose of this product specification is to define Network Rail's requirements for the supply of wood sleepers, wood bearers and longitudinal timbers.

Timber is a natural product and therefore subject to variations of colour, density, shape and consistency. The purpose of this specification is to promote the economically, environmentally and socially sustainable use of timber in supporting and distributing the loads of rail traffic.

2 Scope

This specification applies to the supply of new hardwood and softwood timber for use as:

- sleepers for plain line;
- bearers in switch and crossing layouts;
- longitudinal timbers for bridges and pit roads.

The scope of this standard includes the minimum requirements for quality control and inspection prior to delivery and installation. It also specifies accepted methods of preservation and finishing. The scope excludes:

- fence posts;
- timber for use in buildings (commercial and operational);
- timber elements in structures other than longitudinal timbers.

This specification shall be complied with by all personnel who are responsible for supplying, purchasing, constructing, renewing or maintaining Network Rail's permanent way infrastructure.

3 Definitions

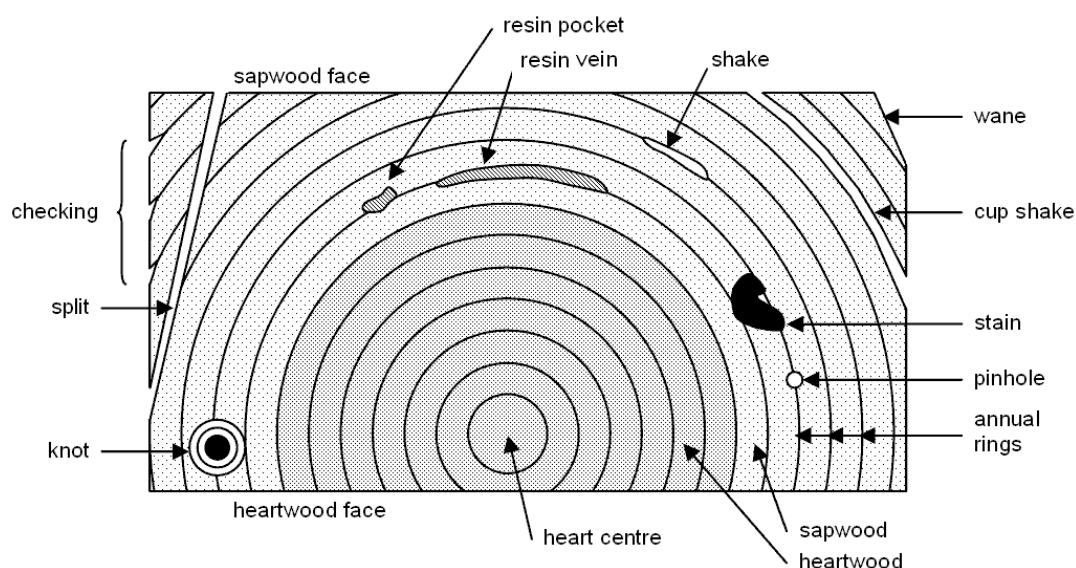


Figure 1: Cross section of a sleeper illustrating glossary terms.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

Annual ring

The growth ring corresponding to an annual period of growth. The pitch of annual rings indicates the uniformity of the tree's rate of growth.

Bark

The outer protective covering of the trunk, branches and twigs of a tree which consists of two parts; the outer corky tissue and the inner moist and soft material which conducts the sap.

Bark pocket (inbark)

Pockets of bark partially or totally enclosed within the wood. Resin or gum may also be present in the pocket.

Bow

The bending caused by internal stresses in a piece of sawn timber, which creates a hog, or sag in a bearer or sleeper laid in the normal way (i.e. wide faces up and down, e.g. Figure 2).

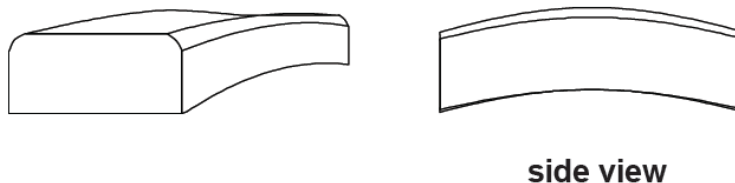


Figure 2: Bow.

For the purpose of this specification bow is to be measured as the mean of the maximum offsets from string lines stretched between the ends of the piece along each edge of the wide hollow face.

Checking

Longitudinal crack or series of cracks, in the surface of a piece, which does not penetrate more than about 15mm. Usually occurring during seasoning.

Cup

Curvature of a piece of timber across the width of the face (see Figure 3), measured as the maximum offset from a string line stretched across the wide face of the piece.

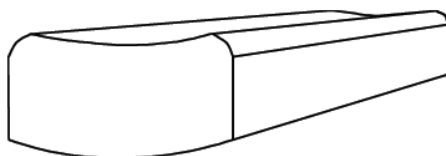


Figure 3: Cup.

Cup shake

A split following round a growth ring, which may resurface, on the same or adjacent face. Also known as ring shake.

Decay

See Rot.

Ref:	NR/L2/TRK/029
Issue:	5
Date:	05 September 2015
Compliance date:	05 December 2015

End split

A split to the end of the piece.

False heartwood

Inner zone of wood that has an abnormal colour, often in a species in which there is no marked colour contrast between heartwood and sapwood.

FSC

Forest Stewardship Council.

Grain

The general direction or arrangement of fibres.

Heart, heart centre

The small central fibrous core of the heartwood including the pith, normally about 30mm diameter.

Heart shake

Radial end shake originating at the pith.

Heartwood

The dense, inner part of the trunk and branches of a tree, yielding the hardest wood, where the cells are inactive and do not conduct sap or store food for the living tree. The most durable part of the (untreated) wood.

Heartwood face

The wide face on which more heartwood is exposed.

IUCN Red List

Catalogues and highlights plants and animals that are facing a higher risk of global extinction.

Knot

A portion of a branch that is embedded in the wood by the natural growth of the tree. The size of the knot is the mean of the longest and shortest diameters.

Longitudinal timbers

Large cross-section timbers of timber used on some bridges and positioned under each rail longitudinally. They may act as a beam as well as the securing point for the baseplates. They are also used to support rails along the edges of pits in depots. Also known as waybeams or wheel timbers.

Loose knot

A dead knot that is not held firmly in place.

PEFC

Programme for the Endorsement of Forest Certification.

Pin hole

An insect hole showing discolouration of the tunnel, usually not more than 1.5mm in diameter.

Pith

Central core of the stem of a tree that consists chiefly of parenchyma or soft tissue.

Primary rot

Any rot occurring in the green tree before felling.