

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

Level 2

Longitudinal timbers – Design, installation and maintenance

Endorsement and Authorisation

Endorsed by:

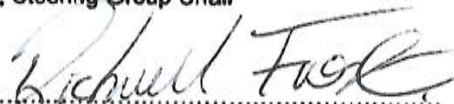


Scott Saxelby, Working Group Chair

Authorised by:

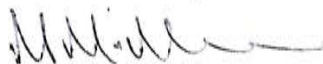


James Dean, Steering Group Chair



Richard Frost, Professional Head (Structures)

Accepted for issue by:



Mick McManus, National Standards Manager

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Issue record

Issue	Date	Comments
1	February 2000	New document. Published as RT/CE/S/038
2	June 2000	Minor corrections
3	February 2001	Minor corrections
4	October 2001	Removal of requirement to record details timber lengths in register.
5	March 2011	Major revision, clarity of requirement for Inspection, Maintenance and Renewal Plans and timescale for compilation. Standard renumbered as NR/L2/TRK/3038.
6	September 2014	Revisions relating to permitted permissible speed over longitudinal timber systems and actions required for bridges where existing speed is above this value.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 06 September 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 the standard.

Reference documentation

BS EN 1990, Section A2.4.4, and supporting National Annex. *Eurocode. Basis of structural design.*

BS EN 1991-2 and supporting National Annex, *Eurocode 1. Actions on structures. Traffic loads on bridges (railway loads).*

GC/RT5021, *Track System Requirements.*

NR/L2/TRK/001/mod01, *Inspection and Maintenance of Permanent Way; Track Inspection.*

NR/L2/TRK/001/mod12, *Inspection and Maintenance of Permanent Way; Track Geometry – Maintenance Design Requirements.*

NR/L2/TRK/2102, *Design and construction of track.*

NR/L2/TRK/2500, *Technical Approval in the Design of Track Infrastructure.*

NR/L3/CIV/039, *Specification for the assessment and certification of protective coatings and sealants.*

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

NR/PS/TRK/029, *Product Specification: Wood Sleepers, Bearers and Longitudinal Timbers.*

NR/SP/CTM/011, *Competence & Training In Track Engineering.*

NR/SP/TRK/042, *Track Geometry Recording.*

RE/PW/043, Chair screws: Normal Grade and High Tensile, Network Rail Civil Engineering Standard Design Drawing.

RT/C/3/003, *Technical Approval of Design, Construction and Maintenance of Civil Engineering Infrastructure (NR/SP/CIV/003)*

TEF 3014, *Annual Longitudinal Timber Examination Report.*

TEF 3021, *Supervisor Visual Inspection of Longitudinal Timbers.*

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Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

Contents

1 Purpose	5
2 Scope	5
3 Definitions	5
4 Competency	8
5 Asset responsibility	8
6 Design	11
7 Installation	20
8 Inspection	21
9 Maintenance and renewal	23
10 Records	25
Figure 1 – Example of flying end	6
Figure 2 – Example of fully supported longitudinal timber on rail bearer between cross girders	7
Figure 3 – Example of fully supported longitudinal timber (non-spanning) supported on cross girders	7
Figure 4 – Example of un-supported longitudinal timber (spanning) supported on cross girders	7
Figure 5 – Diagram of baseplate/chair spacing and edge/end clearance dimensions	16
Table 1 – Responsibilities for longitudinal timber systems and supporting structures	9

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

1 Purpose

The use of this standard sets out the requirements for achieving compliance with the requirements of Railway Group Standard GC/RT5021, *Track System Requirements* in respect of longitudinal timbers.

2 Scope

This Network Rail standard specifies:

- a) the minimum requirements for the design, supply, installation, inspection and maintenance of longitudinal timbers systems on Network Rail infrastructure;
- b) processes to be used for the management of the interface between longitudinal timbers systems with supporting structures and the rails, baseplates, chairs and, where applicable, sleepers.

This standard applies to longitudinal timber systems forming part of tracks on Network Rail infrastructure. The rails, baseplates and chairs may be directly supported by the longitudinal timbers or be carried on cross sleepers fixed to the longitudinal timbers.

This standard does not specify the design, inspection or maintenance of supporting structures.

A longitudinal timber system is considered to be part of the track system.

3 Definitions

For the purpose of this standard, the following definitions apply.

bedding layer

layer of material, such as mastic asphalt, positioned between the longitudinal timbers and the supporting structure to distribute bearing stresses and provide resilience

borate rod preservation

prolongation of the life of softwood timber by the insertion of rods of sodium octaborate into the timber

fastening (rail)

device used to secure rails into baseplates, chairs, or directly to the sleepers, bearers or timbers

fatigue failure

failure of a metal under cyclic or repeated load at a stress below its failure stress under static loading

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

flying end

outermost pair of longitudinal timbers on a structure that extend into and are supported by the ballast formation

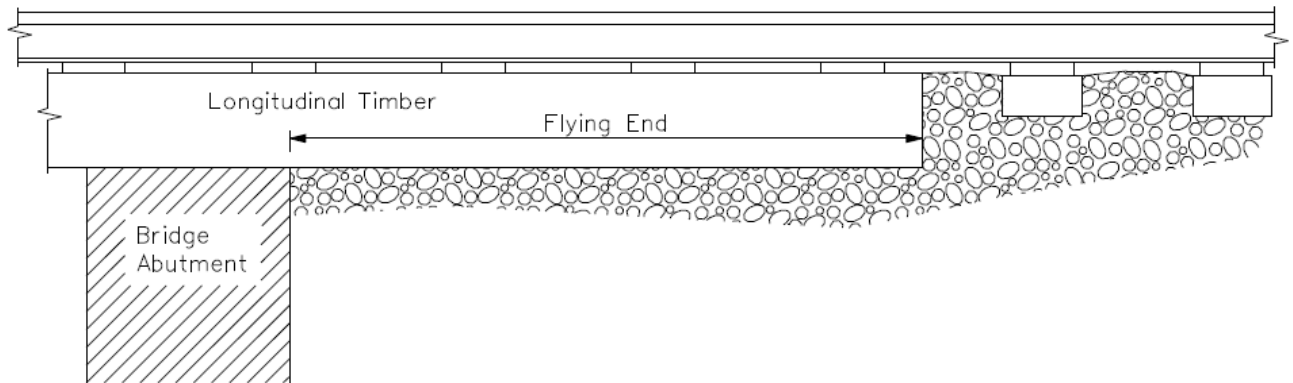


Figure 1 – Example of flying end

fixing

load bearing connection between elements of the longitudinal timber system or between the longitudinal timber system and the supporting structure

gauge tie bar

metallic adjustable bar providing connection between the foot of adjacent rails used as a temporary measure to prevent gauge widening

NOTE Gauge tie bars used on rails with track circuits are required to be insulated.

longitudinal timber

timber bearer parallel to and supporting a rail on baseplates or chairs

longitudinal timber structural strength

a longitudinal timber having the strength necessary to carry and transfer rail traffic loading to the supporting structure

NOTE This will vary significantly dependant on the extent to which the longitudinal timber acts as structural member and the designed support conditions.

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

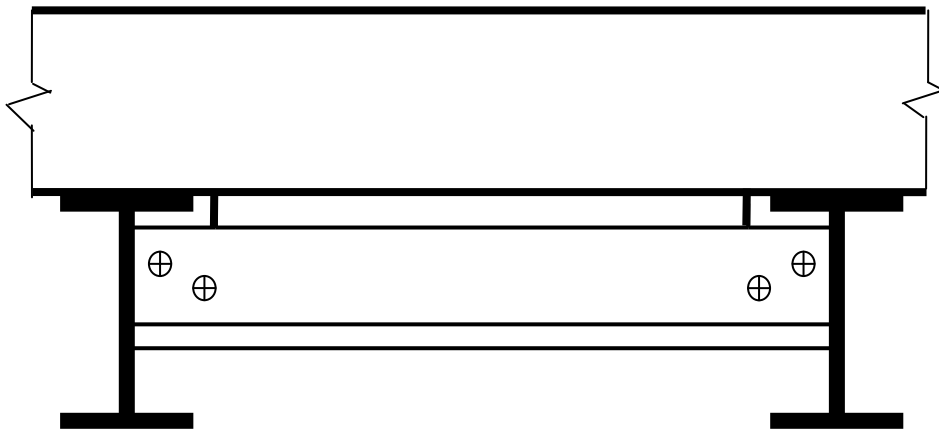


Figure 2 – Example of fully supported longitudinal timber on rail bearer between cross girders

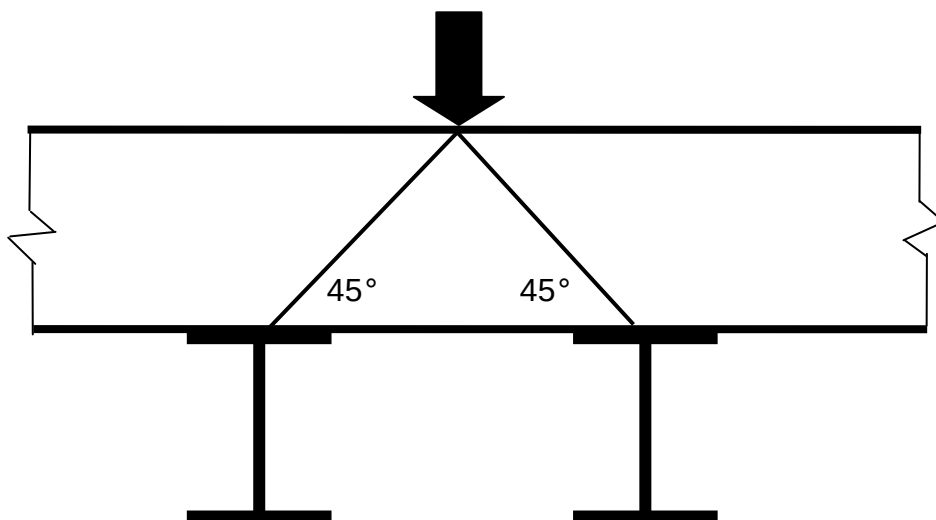


Figure 3 – Example of fully supported longitudinal timber (non-spanning) supported on cross girders

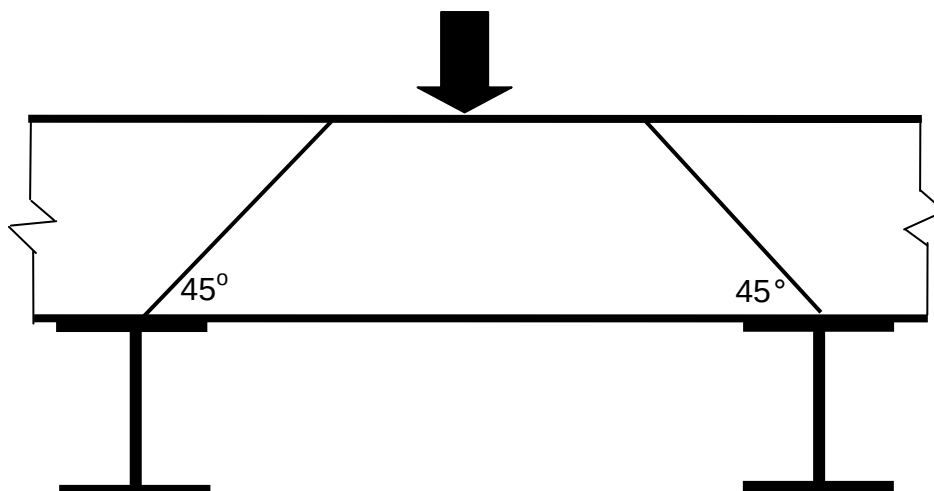


Figure 4 – Example of un-supported longitudinal timber (spanning) supported on cross girders

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

longitudinal timber system

pair of longitudinal timbers together with:

- any transverse fixings between the longitudinal timbers;
- the interface with, and connections to, the supporting structure, if applicable;
- the rail support arrangements;
- the interface with, and connections to, sleepers, if applicable;
- transitional arrangements, if any, between the rails supported on longitudinal timbers and ballasted track

tie rod

metallic rod fitted with plates and locknuts at each end that provides connection between pairs of longitudinal timbers

NOTE Where required, a tie rod is usually installed adjacent to a transom that interact together to maintain a pair of longitudinal timbers a set distance apart. Dependant on type of component design, a gauge tie may also be known as a hook bolt or turnbuckle.

transom

transverse member between longitudinal timbers

transition beam

connecting unit installed between ballasted track and rails supported on longitudinal timbers that provides a gradual change in stiffness between each form of construction

structure

underbridge, intersection bridge or viaduct constructed of concrete, masonry, steel or wood that carries a longitudinal timber system

4 Competency

Persons responsible for the Supervisor visual track inspection and the detailed inspection and maintenance of longitudinal timber systems shall be competent in accordance with NR/L2/CTM/011.

Persons responsible for the design and installation of longitudinal timber systems shall be deemed competent by the relevant Route Asset Manager (Track) or Route Structures Engineer.

5 Asset responsibility

Asset responsibility between Structures and Track functions for the inspection, maintenance and renewal of the longitudinal timber systems and the supporting structures shall be as specified in Table 1.

Ref:	NR/L2/TRK/3038
Issue:	6
Date:	06 September 2014
Compliance date:	05 December 2014

Component type	Asset owner	Asset inspection	Asset maintenance	Isolated replacement (like for like). Design and design approval	Asset renewal
longitudinal timber – continuously supported on supporting structure	RAM (Track)	SM(T)	SM(T)	TME with RSE design approval for the connection system to structure.	TME with RSE design approval for the connection system to structure.
longitudinal timber – not continuously supported on supporting structure	RAM (Track)	SM(T)	SM(T)	TME with RSE design approval for timber strength and connection system to structure.	TME with RSE design approval for timber strength and connection system to structure.
Rail, Baseplates, Chairs, Clips/Keys, Pads, Insulators, Chair Screws, Chair/Baseplate Packing	RAM (Track)	SM(T)	SM(T)	TME	TME
Transoms, Tie Rods, Hook Bolts, Timber Cross bracing and Timber Cradles, Washers, Nuts and Locknuts (Maintaining gauge)	RAM (Track)	SM(T)	SM(T)	TME	TME
Connection System between longitudinal timbers and supporting structure – above the top of the supporting structure	RAM (Track)	SM(T)	SM(T)	TME with RSE approval for the connection to structure and loading issues.	RAM (Track) with RSE approval for the connection to structure and loading issues.
Connection System between longitudinal timbers and supporting structure – below the top of the supporting structure	RAM (Track)	Structures Examiner	SM(T)	TME with RSE approval for timber strength and connection to structure and loading issues.	RAM (Track) but requires RSE involvement.
Supporting structure	RSE	RSE	RSE	RSE	RSE

Table 1 – Responsibilities for longitudinal timber systems and supporting structures