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Issue:	4
Date:	05 March 2016
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Level 2

Specification: Concrete Sleepers and Bearers

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User information

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

Red requirements – no variations permitted

- Red requirements are to be complied with and achieved at all times.
- Red requirements are presented in a red box.
- Red requirements are monitored for compliance.
- Non-compliances will be investigated and corrective actions enforced.

Amber requirements – variations permitted subject to approved risk analysis and mitigation

- Amber requirements are to be complied with unless an approved variation is in place.
- Amber requirements are presented with an amber sidebar.
- Amber requirements are monitored for compliance.
- Variations can only be approved through the national non-compliance process.
- Non-approved variations will be investigated and corrective actions enforced.

Green guidance – to be used unless alternative solutions are followed

Guidance should be followed unless an alternative solution produces a better result.

Guidance is presented with a dotted green sidebar.

Guidance is not monitored for compliance.

Alternative solutions should be documented to demonstrate effective control.

Amendment marks

- First document amendments are presented with a single black line to the right of the affected text.
- Second document amendments are presented with a double black line to the right of the affected text.

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Issue record

Issue	Date	Comments
1	Dec. 1996	Superseded BR1212. Complete document, incorporating requirements of draft EN
2	Aug. 2003	To be read alongside EN 13230
3	Dec. 2015	Up-issue to incorporate various changes throughout document
4	Mar. 2016	Re-issue for clarification and incorporation of changes following subsequent industry review

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 05 March 2016.

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

This document shall be read in conjunction with EN 13230. At the beginning of each section the reader is referred to EN 13230, except for any clauses which differ from, or are additional to, EN 13230; these clauses are then written out using the same numbering as in EN 13230.

The specification is intended to be used with the EN standards:

EN 13230-1: General requirements

EN 13230-2: Prestressed monoblock sleepers

EN 13230-4: Prestressed concrete bearers for switches and crossings

EN 13230-5: Special elements

Changes or additions to EN 13230 are explained in the text.

Concrete sleepers and bearers are safety-critical components for railway applications. They are not covered by any other standards.

Guidance documents for handling, cutting, drilling, demoulding and repairing have been produced to complement this standard and are available on request from Network Rail.

References to the purchaser in EN 13230 shall be read as references to Network Rail.

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Normative references

This specification incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 13230-1 to 5	Concrete Sleepers and Bearers
EN 13481-1	Railway applications/Track: Performance requirements for fastening systems Part 1: Definitions
EN 13481-2	Railway applications/Track: Performance requirements for fastening systems Part 2: Fastening systems for concrete sleepers
EN 13146-4	Railway applications/Track: Test methods for fastening systems Part 4: Effect of repeated loading
EN 13146-5	Railway applications/Track: Test methods for fastening systems Part 5: Determination of electrical resistance
EN 196	Methods of testing cement
EN 197-1	Cement-Composition, specifications and conformity criteria Part 1: Common elements
BS EN 10080	Concrete reinforcing steels
BS prEN 10138 & BS EN 5896	Prestressing steels
BS EN 206	Concrete – Performance, production and conformity
BS EN ISO 9001	Quality management systems
BS 4449	Steel for the reinforcement of concrete
BS EN 933	Testing aggregates
BS EN 12620 & PD 6682	Aggregates from natural sources for concrete
BS EN 12390-4	Testing hardened concrete. Compressive strength. Specification for testing machines
BS EN 450	Fly ash for concrete
BS EN 15167	Ground granulated blast furnace slag for use in concrete, mortar and grout
BS EN 934-2	Concrete admixtures
BS 8110	Structural use of concrete
BS 8500	Complementary British Standard to BS EN 206
BS EN 1008	Mixing water for concrete
BRE Digest 330	Alkali silica reaction in concrete
NR/L2/TRK/4100	Serviceable concrete sleepers for use in running lines and sidings

In general, the EN reference is given in the text, followed by the equivalent BS. It is envisaged that as the BS documents are withdrawn, all references will be to

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European Standards. In the current changeover period, the supplier may use the BS or EN standard, but must declare which is the appropriate design, specification or quality documentation, all as approved by Network Rail.

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1 Purpose

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

2 Scope

This specification gives technical requirements to be met by newly-manufactured concrete sleepers, bearers and related items procured for use in Network Rail's infrastructure. The specification should be read in association with the appropriate Network Rail standard drawings (RE/PW/XXX) for the particular sleeper or bearer design or with the manufacturer's accepted alternative designs.

This specification applies to the supply of new concrete sleepers and bearers for use as:

- a) sleepers for plain line;
- b) bearers in switch and crossing layouts;

This specification applies to all personnel who are responsible for supplying, purchasing, constructing, renewing or maintaining Network Rail's infrastructure.

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3 PART 1 - General Requirements

Refer to EN 13230-1 except for the following clauses which either replace or augment the similarly-titled clauses in EN 13230-1.

3.1 General (this clause augments clause 4.1 in EN 13230-1)

Only fastening systems approved by Network Rail shall be used.

3.2 Positive bending moment at rail seat (M_{dr}) (this clause augments clause 4.3.2.1 in EN 13230-1)

Use the values of M_{dr} , k_1 and k_2 given in Annex H of this specification.

3.3 Negative bending moment at rail seat (M_{dr_n}) (this clause augments clause 4.3.2.2 in EN 13230-1)

Use the value of M_{dr_n} given in Annex H of this specification.

3.4 Negative bending moment at the centre part (M_{dc_n}) (this clause augments clause 4.3.3.2 in EN 13230-1)

Use the value of M_{dc_n} given in Annex H of this specification.

3.5 Data supplied by Network Rail (this clause augments clause 4.4.2 in EN 13230-1)

The data elements listed in clause 4.4.2 of EN 13230-1 are supplied by Network Rail, some of which are also specified in Annex H of this specification.