AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline
Engineering Specification

Category
Track & Civil

General Appendix to ARTC Track and Civil Code of Practice

Specification Clauses

Sleepers, Bearers and Fastenings

ETG-02-01

Applicability

ARTC Network wide	
New South Wales	
Western Jurisdiction	✓
Victoria	✓

Primary Source
(ARTC A1 Specifications Sleepers and Fastenings, Inspection & Assessment and Work on Asset/TCS-18)

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List of Amendments

Issue	Date	Clause	Description
1.0	01/05/2006		First issue

2.7. Sleepers, Bearers & Fastenings

2.7.1 Procurement and Manufacture

2.7.1.1. Concrete Sleepers and Bearers

All concrete sleepers and bearers shall be manufactured in accordance with AS 1085.14 and relevant ARTC specification.

The design of medium duty concrete sleepers shall comply with ARTC Standard ETD-02-01 Concrete Sleepers (Medium Duty) - Design.

Refer to ARTC Appendix ETD-03-02 Concrete Bearers for details.

2.7.1.2. Timber Purchase

Refer to ARTC Specification ETA-02-01 Sleeper Turnout and Bridge Transom Specification Timber.

2.7.1.3. Steel Sleeper Purchase

Where steel sleepers need to be purchased for the replacement of existing steel sleepers, these shall be the same type as existing or the currently available equivalent, unless otherwise specified by ARTC.

2.7.1.4. Fastening Purchase

Where sleeper fastenings need to be purchased for the replacement of existing fastenings, these shall be the same type as existing, or the currently available equivalent, unless otherwise specified by ARTC.

2.7.1.5. Pad Purchase

Where sleeper pads need to be purchased for the replacement of existing sleeper pads, these pads shall be the same type as existing, or the currently available equivalent, unless otherwise specified by ARTC.

In general, the following shall apply:

- Heavy duty pads to be used on curved track below 500 metre radius.
- All pads shall be suitable for insulation in track circuited areas

2.7.1.6. Spacers (Insulated and Metal) for Concrete Sleepered Track

In general, the following shall apply for the replacement of existing sleeper spacers:

- Dimensions to ensure effective holding of the specified track gauge
- Compatibility with the existing fastening assembly system
- Where required for electrical insulation with a minimum electrical resistivity of 10^7 ohm m.

2.7.1.7. Resilient Fastening Assemblies

The design of resilient fastening assemblies for medium duty concrete sleepers shall comply with ARTC Standard ETD-02-02 Resilient Rail Fastenings for Medium Duty Concrete Sleepers - Design.

2.7.2 Construction

2.7.2.1. Installation of New Track

(a) General

The installation of new track (including the reinstatement of track on existing formation) shall be to one of the following classes:

- Concrete sleepered track (main line or crossing loop)
- Steel sleepered track (main line, crossing loops or other sidings)
- Timber sleepered track (main line, crossing loops or other sidings)

Note that second grade or selected derailment damaged concrete or steel sleepers shall be used for the construction of crossing loop and siding tracks, subject to availability.

The class of track to be constructed shall be as directed by ARTC.
The Contractor shall provide details of the procedures to be used in the installation of new tracks of both the above types, including the following:

- Method(s) of handling and placing sleepers.
- Method(s) of laying ballast.
- Method(s) of handling and placing rail
- Method(s) of applying fastenings, including specialist equipment to be used.
- Method(s) of tamping track, including equipment to be used.
- Specialised track laying plant (if any) to be employed.

Such procedures must meet the requirements below and be approved by ARTC prior to commencement of work.

(b) Drainage

Drainage systems for new installation sites shall be specified by the Contractor and approved by ARTC prior to commencement of work.

Surface runoff must be directed away from the new and any adjacent track structure.

(c) Formation

Where required, the formation shall be constructed or overhauled in accordance with the requirements in ARTC Appendix ETC-08-02 Railway Earthworks.

(d) Ballast

Ballast used for this activity and ballast profiles for the track shall be in accordance with the requirements specified in Section 4.

(e) Sleepers and Fastenings

- Sleeper spacing shall be 667mm nominal (1500 per kilometre).
- Sleepers and fastenings shall be installed in accordance with the manufacturers Specifications and as specified Clause 2.7.3. The tolerance on the sleeper spacing shall be +/- 10mm.

(f) Tamping

Tamping shall be installed in accordance with the requirements specified in Section 5.

(g) Rail

Rail shall be installed in accordance with the requirements specified in Section 1.

2.7.3 Maintenance

2.7.3.1. Fastening and Spacer Installation/Replacement

Sleeper fastenings (including baseplates and rail anchors) and spacers for concrete sleepered track shall be inserted into the track:

- In such a manner as to prevent physical damage and loss of life of the fastening, spacer, sleeper or rail.
- Installed to the assembly specification.

2.7.3.2. Sleeper Pad Installation/Replacement

Sleeper Pads shall be inserted into the track:

- In such a manner as to prevent physical damage and loss of life of the pad
- Installed to the assembly specification.
- Clean rail seat and underside of rail before insertion

2.7.3.3. Regauging Timber Bearers

The regauging of existing timber bearers by boring new holes into sound timber and respiking, shall be permitted.

Timber bearers that have previously been regauged shall not be again regauged. Sliding the bearer approximately 70mm under the rail to avoid spike-killing may be carried out in turnouts as directed by ARTC.

2.7.3.4. Regauging Timber Sleepers

The regauging of existing timber sleepers by boring new holes into sound timber and respiking, shall be permitted.

Timber sleepers that have previously been regauged shall not be again regauged. Sliding the sleeper approximately 70mm under the rail to avoid spike-killing may be carried out in curves as directed by ARTC.

2.7.3.5. Regauging Timber Transoms

The regauging of existing timber transoms by boring new holes into sound timber and respiking, shall be permitted.

Timber transoms that have previously been regauged shall not be again regauged, unless special extended plates with resilient fastenings are used, which enable new holes to be bored in sound timber.

2.7.3.6. Resilient Fastening Installation on Timber Sleepers

The substitution in timber sleepers, bearers or transoms of approved resilient fastening systems instead of ordinary dog spikes shall be permitted, subject to the provisions of Clause 2.7.3.16.

The replacement of existing resilient fastening systems in timber sleepers, bearers or transoms by ordinary dogspikes shall only be permitted with the approval of ARTC.

2.7.3.7. Shimming of Timber Sleepers, Bearers and Transoms

Where a sound timber sleeper fails to hold a dog spike, the use of shims, to allow respiking in sound timber of the original hole shall be permitted in loop and yard tracks.

2.7.3.8. Sleeper Installation/Replacement

Concrete, steel and timber sleepers, complete including fragments and fastening systems, shall be removed from the track before the insertion of new sleepers.

Concrete, steel and timber sleepers shall be inserted into the track:

- In such a manner as to prevent physical damage to and loss of life of the sleeper and any fastening shoulders
- At the spacing specified by ARTC for the particular track section.
- Normal to the running rails
- Using the fastening system specified by ARTC.

2.7.3.9. Turnout Bearer Installation/Replacement

Where Bearers are removed, all fragments and fastening systems shall be removed from the points and crossings before the insertion of new bearers.

Bearers shall be inserted into the points and crossing structure:

- In such a manner as to prevent physical damage and loss of life of the bearer
- At the spacing and perspective specified on the points and crossings drawings
- Using the fastening system specified by ARTC.

The Contractor shall specify the methods for bearer removal and insertion.

2.7.3.10. Timber Transom Installation/Replacement

Timber Transoms complete including fragments and fastening systems shall be removed from the bridge before the insertion of new transoms.

Timber Transoms shall be inserted into the bridge:

- In such a manner as to prevent physical damage and loss of life of the transoms
- At current transom spacing unless otherwise specified by ARTC
- Normal to the running rails
- Fastened to the bridge girders by a fastening system in accordance with the Designer/Manufacturer recommendation, or as specified by ARTC.

The Contractor shall specify the methods for timber transom removal and insertion.

2.7.3.11. Bridge Transom Service

Timber transoms on bridges shall be serviced by:

- Checking that the transom spacing is correct (refer to relevant bridge drawings for design spacing)
- Respace transoms when spacing is greater than 50mm from specified spacing.
- Tighten transom to girder fastening system as required.

2.7.3.12. Transom to Girder Fastening Purchase

Where Transom to Girder fastenings need to be purchased for the replacement of existing fastenings, these shall be the currently available equivalent, or where alternatives are proposed these shall be agreed with ARTC.

2.7.3.13. Use of Part-Worn Materials

Unless specifically agreed in advance by ARTC, the installation of part-worn or second hand sleepers, fastenings and their component parts and assemblies shall not be used in mainline tracks, but are permitted in crossing loops and sidings where agreed with ARTC.

2.7.3.14. Repair of Concrete Sleepers

The Contractor shall not repair concrete sleepers unless approved by ARTC.

2.7.3.15. Interspersing of Sleeper Types

Except in the case of emergency repairs, the interspersion of different sleeper types (for example timber with steel or concrete) in new or existing installations in main line is not permitted without the approval of ARTC.

The minimum number of adjacent sleepers of one type is 200, except in special locations such as turnouts, level crossings and transom topped bridges. Transitions and curves of less than 400m radius shall consist of one type of sleeper.

Concrete sleeper designs may be mixed in track provided the gauge, and depth dimensions are within ±10mm from rail seat to sleeper soffit of the sleepers in track.

Care should be taken when regulating track to ensure damage is not caused to the top of sleepers where interspersing of sleeper types occur.

2.7.3.16. Interspersing of Fastening Types

Except in the case of emergency repairs, the interspersion of different types of fastenings (for example resilient fastenings with dogspikes) in new or existing installations is not permitted without the approval of ARTC.

The minimum number of adjacent sleepers with fastenings of one type is 200, except in special locations such as turnouts, level crossings and transom topped bridges. Transitions and curves of less than 400m radius shall consist of sleepers with one type of fastening.

Care should be taken when regulating track to ensure damage is not caused to fastenings where interspersing of fastening types occur.

2.7.4 Inspection and Assessment Clauses

2.7.4.1. Sleeper and Fastenings Inspection after Insertion

All sleepers shall be visually inspected after insertion to ensure that the complete fastening assembly has been fitted, and that all components are in the correct location in the assembly.

Where any defect is found in the sleeper/fastening assembly it shall be immediately corrected or an appropriate speed restriction applied.

On timber sleepered track, the gauge shall be measured at sufficient intervals to ensure the location of the fastening assemblies on the sleepers is correct.

2.7.4.2. Marking of Defective Sleepers

All sleepers assessed as defective shall be marked with a permanent paint mark on the sleeper which can be readily identified for a period of at least 2 years.

Separate colours or marking patterns shall be used for condemned sleepers, those that are reusable in other than main lines, and those sleepers that are able to be repaired.

2.7.5 Reuse of Treated Timber

Treated timber sleepers, bearers or transoms shall not be reused in track, unless otherwise authorised by ARTC.