

## SECTION 215

## MAINTENANCE OF PERMANENT WAY

### Maintenance generally

- 1** Maintenance of the Permanent Way shall be carried out in accordance with Railtrack Line Standard RT/CE/S104, and for CWR, in accordance with the additional requirements of Railtrack Line Standard RT/CE/S011.

When following an inspection of the Permanent Way in accordance with Section 214: Inspection of Permanent Way, a defect is discovered or reported to the Contractor, action shall be taken to rectify the fault, and all necessary work undertaken to restore the track to the construction standard specified in Section 217: Construction Standards for Permanent Way.

Where track at the location of a track or bridge renewal is handed over to Railtrack's track renewals or bridge contractor, maintenance of the Permanent Way shall be carried out by Railtrack's track renewals or bridge contractor as applicable.

Where the Contractor is seriously concerned with the condition of the track, and considers renewal will be required within 12 months and trial holes taken in accordance with Clause 215.004 confirm such concerns, the Employer's Representative shall be advised accordingly in writing.

(215.001)

### Ballast

- 2** Further to Railtrack Line Standard RT/CE/S102, ballast shall be kept well consolidated.

Adequate quantities of ballast shall be provided prior to lifting, tamping or lining work and on completion of the work any deficiencies shall be made good. Ballast regulation shall be carried out as necessary.

A record shall be maintained of all:

- (i) underbridges where the ballast depth is 150 mm or less,
- (ii) locations where ballast consolidation has been carried out using the 'stone blower',
- (iii) locations where ballast has been 'ballast glued'.

Ballast consolidation using on track machines shall not be carried out at such underbridges or locations, or where damage to waterproofing of bridges may otherwise occur when using such machines.

Lengths of track that have been consolidated by ballast gluing or by use of the 'stone blower' shall be marked on the track such that the marking is clearly visible to operators of on track machines.

(215.002)

**Repair of slurried track**

- 3** Except where an emergency repair is carried out, the reason for the formation of a “wet spot” shall be remedied in advance of, or at the same time as, the wet spot treatment is undertaken. Possible reasons may include dipped joints, poor quality welds showing dips and humps, ballast and drainage deficiencies, loose or missing fastenings, missing rail pads and rail surface irregularities.

Where an emergency repair is carried out, a temporary repair shall be carried out, and further work shall be carried out to rectify the cause of the wet spot as soon as is practicable.

The method of work shall be as follows unless the Contractor can demonstrate that his method of work is at least equivalent in all respects:

- (i) shovel pack all sleepers to eliminate voids,
- (ii) excavate all ballast from between first and second sleepers and open out the crib between second and third sleepers to just below bottom of sleeper level for the length of the sleepers,
- (iii) produce crossfall to nearest drain or suitable ground between first and second sleepers,
- (iv) backfill crib between first and second sleepers with clean stone to bottom of sleeper level, consolidating the ballast in 50 mm to 75 mm layers for a distance of 375 mm either side of each rail,
- (v) unclip second sleeper, remove insulators and pads and move the sleeper on to the clean stone provided in crib between first and second sleepers and fit new pads, insulators and clips and pack sleeper,
- (vi) excavate remaining ballast in crib between second and third sleepers and the ballast which originally supported the second sleeper,
- (vii) repeat steps (iii) and (iv) and return the second sleeper to its correct position, and pack sleeper,
- (viii) repeat steps (v) to (vii) for the remaining sleepers which require treatment,
- (ix) excavate the ballast at the sleeper ends in the interval between tracks in lengths not exceeding 1.5 metres to the same depth reached when the cribs were excavated, and backfill with clean ballast and consolidate before moving to the next 1.5 metres section,
- (x) excavate the ballast shoulder as in step (ix), repeating the process throughout the affected length,
- (xi) fettle the track, and ensure shoulders are to the correct profile and consolidate the ballast.

The minimum depth of clean ballast to be provided below the bottom of the sleepers shall be in accordance with Railtrack Line Standard RT/CE/S102 applicable to the track category for the location. The bottom of the excavation shall fall towards the nearest drain or suitable ground. A crossfall of 75 mm over the length of a sleeper shall be provided.

(215.003)

**Trial holes for  
relaying  
inspections**

- 4** Trial holes for relaying inspections shall be excavated at locations and to depths as necessary when the Contractor proposes renewal in accordance with Clause 215.001, or as directed by the Employer's Representative.

The interval between trial holes shall be as follows:

- (i) relaying and/or reballasting/ballast cleaning - one trial hole every 100 metres,
- (ii) blanketing - one trial hole every 50 metres with additional holes as necessary in the 50 metres at each end of the item to verify limits of work.

Trial holes for relaying inspections shall be taken from the centre line of the 'six foot' to the cess path through the shoulder or to the bridge abutment or parapet, platform wall or other feature which may encroach into machine working space or which may be rendered unstable when work is undertaken adjacent to structures.

The minimum depth shall be either to the sand/stone dust blanket (but to not pierce polythene or other membrane) or to 380 mm below underside of sleeper or S&C bearer or timber if no blanket is present. Bridge deck waterproofing shall not be damaged.

If the trial hole is excavated at a structure, the foundation positions and dimensions, invert of the footings and other relevant conditions shall be proved.

If the trial holes are opened out in advance of inspection date, ballast or sand bags shall be placed in the excavation to maintain track stability.

Trial holes shall be excavated from within one bed or crib at each location and shall not be closer than 1.5 metres to a rail joint, weld or adjustment switch. In S&C trial holes shall not be closer than 1.5 metres to crossing noses, obtuse knuckles or switch toes. Excavated material shall be placed clear of cables, signalling equipment and walkways.

Information arising from the relaying inspection shall be recorded and provided to the Employer's Representative.

On completion of the relaying inspection, all excavated trial holes shall be reinstated with spent ballast to provide a ballast profile in accordance with Railtrack Line Standard RT/CE/S102.

(215.004)

## Sleepers generally

- 5** Sleepers shall be maintained square to the rails and correctly spaced in accordance with Railtrack Line Standard RT/CE/S102.

The method used to square sleepers shall not cause track geometrical track irregularities to exceed the limits specified in RT/CE/S104, applicable to the line speed, and shall not damage track components. Upon completion all fastenings, insulators and other components shall be reinstated, and the ballast profile made good, including packing where necessary.

When replacing or installing additional sleepers in existing sleepers track, compatible types shall be used, preferably of the same design.

Ballast under sleepers shall be kept well packed and free from voids, particularly under the rail bearing portion of each sleeper.

(215.005)

## Defective sleepers

- 6** Isolated sleepers which become defective and/or decayed shall be removed and replaced with sound serviceable or new sleepers of compatible type.

S&C timbers shall be maintained as wood sleepers and concrete bearers as concrete sleepers.

Screw fastenings which become loose shall be tightened and ferrules shall be replaced when worn or damaged.

Where a split is present in a wooden sleeper but the sleeper is otherwise sound the useful life of sleepers may be prolonged by stainless steel bands being fitted adjacent to the chair or baseplates inside and outside the four foot.

Where wooden sleepers have enlarged or elongated baseplate/chair screw holes which are not capable of being treated with maintenance liners but where there are no indications of indentation or adzing, as an alternative to replacing the sleeper, the sleeper may be "pulled through", or turned over with new holes being drilled for the screws or spikes.

Wood sleepers shall be replaced when indentations due to chairs or baseplates are in excess of 6 mm.

Where sleepers are pulled through or turned over:

- (i) any new baseplate or chairscrews holes shall be not less than 75 mm from an existing hole,
- (ii) the distance between the outermost edge of the chair or baseplate to the end of the timber shall not be less than 150 mm and a full seating shall be provided,
- (iii) signalling equipment on the sleeper shall be relocated as required,
- (iv) ballast shoulders shall be reinstated to accord with Railtrack Line Standard RT/CE/S102.

All redundant chair/baseplate screw holes in hardwood sleepers shall be plugged with timber plugs and softwood sleepers shall be plugged with timber plugs or shall have borate rods inserted and the holes capped. Plugs for softwood sleepers shall be treated with an approved preservative before being inserted and the top surface shall be retreated after the plug has been driven home. Plugs for hardwood sleepers shall be made from Jarrah. Softwood sleepers cut on Site shall have the cut surface(s) treated with creosote in accordance with Section 164: Timber Preservative.

(215.006)

**Examination of  
wood sleepers for  
renewal proposals**

- 7** At locations identified by the Contractor, where wood sleepers are identified for renewal, wood sleepers shall be removed from the track for examination, and replaced with serviceable wood sleepers.

The sleepers shall be examined, and the condition rating in accordance with Railtrack Line Standard RT/CE/S103 advised to the Employer's Representative.

(215.007)

**Re-sleeping  
jointed track**

- 8** Where track is to be resleepered, existing track ballast shall be removed to below the bottom of the sleepers, and set aside for re-use. Where considered necessary by the Contractor, the rails may be unfastened and removed from the sleepers and carefully set aside for re-use. Defective sleepers shall be removed and the ballast bed prepared to accept the replacement sleepers.

Sleepers shall be unloaded in a safe manner which avoids damage to components.

The sleepers shall be installed and rails reinstated, in accordance with the relevant Permanent Way Standard Drawings, and to accord with Railtrack Line Standard RT/CE/S102.

(215.008)

**Borate rod  
preservation of  
softwood sleepers**

- 9** Sleepers graded as 3 or 4 by the Sleeper Integrity Tester in accordance with Railtrack Line Standard RT/CE/S103 shall be replaced or treated to preserve the integrity of the sleeper by installing borate rods into holes drilled vertically into the sleeper.

When dissolved, borate rods shall be replaced.

(215.009)

**Gauge**

- 10** Gauge and gauge irregularities shall be maintained within the limits specified in Railtrack Line Standard RT/CE/S104.

Gauge irregularities occurring over short lengths shall be corrected before the deficiencies develop to a state of cyclic sidewear and where traffic is in danger. Particular attention shall be given to any visible movement of baseplates or chairs on the surface of the sleeper or bearer.

Suggested methods of correction of gauge variations in concrete sleepered track include the methods in Table 215/I.

| Table 215/I              |                                           |
|--------------------------|-------------------------------------------|
| Concrete<br>Sleeper Type | Method of Correcting Gauge Irregularities |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EI/Pan 9<br>Conversion          | If concrete is spalled, change sleeper.<br>If concrete is sound ensure fastenings are tight.                                                                                                                                                                                                                                                                                                                                   |
| RD                              | Renew neoprene/plastic heel and clip insulators.                                                                                                                                                                                                                                                                                                                                                                               |
| RNB 6/7                         | Renew neoprene/plastic heel and clip insulators.<br>Where T bolt has lost grip, convert to Pandrol fastenings using glued-in housings.                                                                                                                                                                                                                                                                                         |
| AD                              | Renew clamping block.                                                                                                                                                                                                                                                                                                                                                                                                          |
| BJB                             | If concrete sleeper shoulder has spalled at outside of original gauge plates, fit 6" maintenance gauge plates. If the screws are loose and allowing the gauge plate to over-ride the rail foot, fit maintenance screws. If screw has lost grip in cast-in beechwood insert in sleeper, or if the fitting of maintenance screws does not improve the grip in the insert, convert to Pandrol fastenings using glued-in housings. |
| SHC                             | If corrosion of the "goal post" upstands has not taken place, renew insulator. If corrosion has occurred replace sleeper.                                                                                                                                                                                                                                                                                                      |
| Pandrol<br>Fastened<br>Sleepers | If insulators are crushing use composite insulators.<br>If housings are loose or skewed core out the housings and glue in new housings.                                                                                                                                                                                                                                                                                        |

Gauge variations on wooden sleepers track may be corrected by sleepers being 'pulled through' in accordance with Clause 215.006.

Where patch repair work is carried out, the track gauge on remaining materials shall be adjusted to meet the track gauge of the replacement materials.

Where gauge ties or tie bars (which shall be of the insulated type on track circuited lines) are fitted as a temporary measure to maintain track gauge, permanent repairs shall be carried out within 7 days unless another period is specified in the Contract.

Gauge tie bars shall not be used to maintain PointCare Standards.

Where rail pads are used, the pads shall be replaced at the same time.

Switch soleplates shall be repaired or replaced as necessary to maintain gauge.

(215.010)

## Track geometry quality



Track geometry quality target values below which the recorded standard deviations shall not fall shall be in accordance with Railtrack Line Standard RT/CE/S104.

The track geometry quality target values for each line shall be as detailed in the Contract.

(215.011)

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|---------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Repair of spalled shoulders to concrete sleepers</b> | <b>12</b> | Repairs to spalled shoulders of concrete sleepers shall be carried out using a compatible epoxy resin mortar to replace the spalled material. Should the repair fail, the sleeper shall be replaced.<br>(215.012)                                                                                                                                                                                                                                                                                                                                                                |
| <b>Chairs and keys</b>                                  | <b>13</b> | <p>Chairs shall be kept positioned firmly to the foot and web of the rail and held in place by a key. Where a tapered key has worn or distorted or the chair jaw has become worn the old key shall be replaced by a new key driven in with the addition of a maintenance liner if necessary.</p> <p>Any keys found to be loose or out shall be re-driven immediately.</p> <p>Broken chairs, or those incapable of gripping a key and maintenance liner shall be replaced.</p> <p style="text-align: right;">(215.013)</p>                                                        |
| <b>Baseplates</b>                                       | <b>14</b> | All broken or defective baseplates shall be replaced with baseplates of compatible types.<br>(215.014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Chairscrews</b>                                      | <b>15</b> | <p>Chairscrews shall be checked and tightened where necessary.</p> <p>When chairscrew holes have become enlarged and the timber or sleeper is no longer capable of gripping the chairscrew, maintenance liners or coils may be inserted.</p> <p>Where the fitting of maintenance liners or coils is insufficient to restore the grip of the chairscrew the affected timber(s) or sleepers shall be “pulled through” in accordance with Clause 215.005 or new or serviceable timbers or sleepers provided.</p> <p style="text-align: right;">(215.015)</p>                        |
| <b>Ferrules</b>                                         | <b>16</b> | Ferrules which become distorted or damaged shall be replaced by new ferrules. In cases where the ferrule drops into the chair or baseplate without any force being applied to the ferrule, the chair or baseplate shall be renewed.<br>(215.016)                                                                                                                                                                                                                                                                                                                                 |
| <b>Through bolts</b>                                    | <b>17</b> | In through bolted sleepers, the nuts of all chair bolts shall be systematically oiled and retightened a minimum once every two years. Where through bolt nuts cannot be tightened because of deterioration of the underside of the sleeper, new fastenings shall be fitted, or the sleepers replaced.<br>(215.017)                                                                                                                                                                                                                                                               |
| <b>Flat bottom rail fastenings spike fastenings</b>     | <b>18</b> | <p>Spikes shall be adjusted as required and defective or broken spikes shall be replaced. An effective grip or toe load shall be maintained. Acceptable methods to maintain an effective grip include fitting maintenance liners to, and re-driving the spikes, fitting spikes to previously unused baseplate holes or fitting maintenance spikes as replacements for the original spikes.</p> <p>Should the fitting of maintenance liners or driving of additional spikes, not provide sufficient grip by the spike fastenings one of the following actions shall be taken:</p> |

- (i) the sleeper shall be “pulled through” in accordance with Clause 215.006 and the baseplate reseated,
- (ii) the baseplates shall be replaced with screw fixed baseplates,
- (iii) replacement fastenings ‘low cost’ clips in accordance with Railtrack Line Standard RT/CE/C014 shall be fitted,
- (iv) the sleepers shall be replaced.

Where the method adopted is insufficient to maintain the grip, the sleeper shall be replaced.

The toe load shall be restored in accordance with Table 215/2.

### Restoration of toe load of rail fastenings

| Table 215/2        |                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing Clip Type | Method of Restoring Toe Load                                                                                                                                                      |
| PAN PR 303         | Use PR 304 (LH) clip in appropriate housing.                                                                                                                                      |
| PAN PR 304         | Use PR 427A (RH) clip in original housing to which PR 303 was fitted.                                                                                                             |
| PAN PR 401         | Plain line 113A/ 110A: replace orange nylon insulator with composite insulator branded 1460 and re-clip using PR 401A clips.                                                      |
|                    | S&C: use 402A (LH) clips in appropriate housings.                                                                                                                                 |
|                    | Plain line 109 lb/ 98 lb: Use composite insulator branded 1460 and re-clip using PR 401A clips.                                                                                   |
| PAN PR 427A        | Fit new baseplate.                                                                                                                                                                |
| PAN e 1809         | Replace like-for-like using new orange nylon or composite insulators or e 2001 clips with black GRN insulators.                                                                   |
| SHC                | Replace clips and insulators.                                                                                                                                                     |
| CS3                | Replace clip insulator and nylon heel block.                                                                                                                                      |
| MILLS              | Replace clips and, if clips still loose fit toe shoes (wedges). In extreme cases replace baseplate and fastening assembly.                                                        |
| BJB                | Spalled concrete sleeper shoulder - fit 150 mm maintenance gauge plates. Screw not gripping insert in sleeper - use maintenance screws or if this fails convert to Pan fastening. |
| KT Clip            | Replace clip assembly.                                                                                                                                                            |
| Spring Clip        | Replace clip assembly.                                                                                                                                                            |
| Heyback Clip       | Fit either LC clips or convert to Pandrol fastenings.                                                                                                                             |
| RNB 6/7            | Convert to Pandrol fastenings.                                                                                                                                                    |