Track Work Information Sheet 2P043a
How to change a concrete sleeper by hand

Introduction

This task covers the replacement of all types of concrete sleepers in all types of track. It includes the replacement of any clips, pads and insulators.

Overview

Possible causes of sleeper damage are:

- Voiding
- Excessive tamping
- Dipped joints

Risks & control measures

This TWI does not include any generic safety or risk information, although it does detail some relevant cautions. Risk control measures are detailed in the relevant Work Activity Risk Assessment or Risk Control Sheet and must be implemented as required.

Competence

The site supervisor of this activity must be authorised and competent to deliver this safety critical task.

Critical Rail Temperature

You must not start work if:

- The rail temperature is greater than 32ºC
- The rail temperature is greater than the Critical Rail Temperature (CRT (W)) if less than 32ºC
- The rail temperature is forecast to exceed 38ºC within the next three days

Work must be stopped if the rail temperature rises above either 32ºC (or the CRT (W) if less than 32ºC). The track must be fully ballasted and the temperatures monitored for three days following. If temperatures exceed the CRT (W), protective action against buckles shall be taken.

If the temperature starts to rise rapidly towards 32°C or the CRT then report back immediately. Be prepared to apply an emergency speed restriction (especially if there is insufficient ballast), stop lifting and box in.

Do not attempt to start work if the rail temperature is likely to drop below 0ºC.

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General delivery information

- Concrete sleepers cannot be changed in red zone working
- Replacement sleepers in existing track must be of a similar material and design to those being replaced
- Track gauge must be checked as follows: as the task is being scoped; before the sleepers are removed; after the sleepers are replaced
- It is preferable for the new sleeper to be placed on an established bed and packed using measured shovel packing (MSP), if necessary, to achieve good top. If a new bed is created it could cause differential settlement and result in voiding
- Extra time must be allowed if lateral resistance plates, conductor rail pots or other equipment have to be removed and replaced as part of the same shift
- A minimum of 8 staff are required to lift concrete sleepers
- If more than 4 sleepers are to be changed it may be more cost effective to use the RRV mounted sleeper changing and tamping attachment. This process also allows for new sleepers to be brought to site and scrap removed on the RRV trailer

Planning and productivity

- Standard job ref – 009092
- MNT code - 003
- Norm time per sleeper – 5.73 hours
- Standardised Norm time per person per sleeper with clearance to slide sleeper into cess – 2.05 hours
- Labour Requirements – 8 staff

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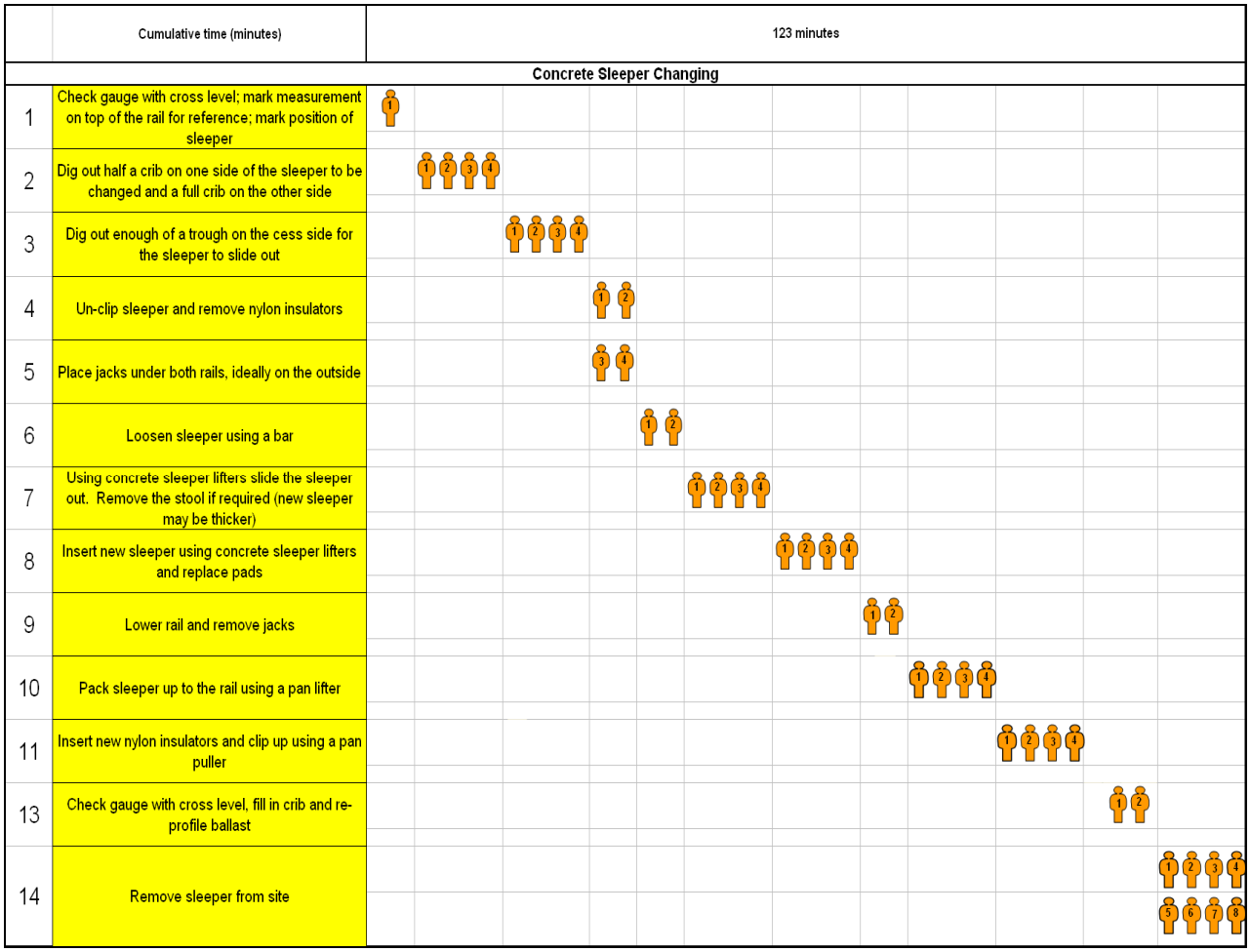
Delivery process for changing 1 sleeper



Tools, plant and equipment that may be required

Tools	***Number***
Cross level gauge	1
Chalk or crayon	As required
Ballast shovels, forks and picks	As required
Jacks	2
Rail thermometer	1
Pan setter	1
Bars	2
Sleeper packing tools	As required
Appropriate tool for removing and replacing fastenings	As required
Materials	
Fastenings, pads and insulators	New for each sleeper
Sleepers	New for each sleeper
14mm MSP chippings	As required

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How to change a single concrete sleeper where clearance exists to slide sleeper out of bed

1. Check rail temperature and track gauge. Mark position of sleeper(s) to be changed.

2. Lateral resistance plates or conductor rail pots must be removed and then reinstated after the new sleeper and rail have been reconnected.
3. Dig out half a crib on one side and a full crib on the other side of the sleeper to be replaced to a depth of 2-5cm below the sleeper base. Dig out the sleeper ends and enough of a trough on the cess side for the sleeper to slide out.
4. Unclip the sleeper to be changed and three sleepers either side.
5. Place jacks under both rails in the half dug out area and jack up the rails 2 - 3cm. Ideally, place the jacks on the outside edge of the rail foot.

6. Bar the sleeper into the opened out bay. Then slide the sleeper out through the cess trough, taking care not to disturb the stool.
7. Slide in the new sleeper and align to original markings, insert new pads, lower the rail, insert new insulators and re-clip the rail.
8. Re-clip the other sleepers on either side.

9. Check gauge and top and amend as required. Next, fill in the cribs and re-profile ballast and ballast shoulders.

Site clearance

Remove any scrap components and sleepers from site. If they are to be left for a scrap vehicle to recover, components must be stacked and banded together pending removal.

Check

If possible watch the track under traffic. If there is voiding then lift and pack as required. A follow up inspection within 4 days is essential to confirm no excessive settlement.

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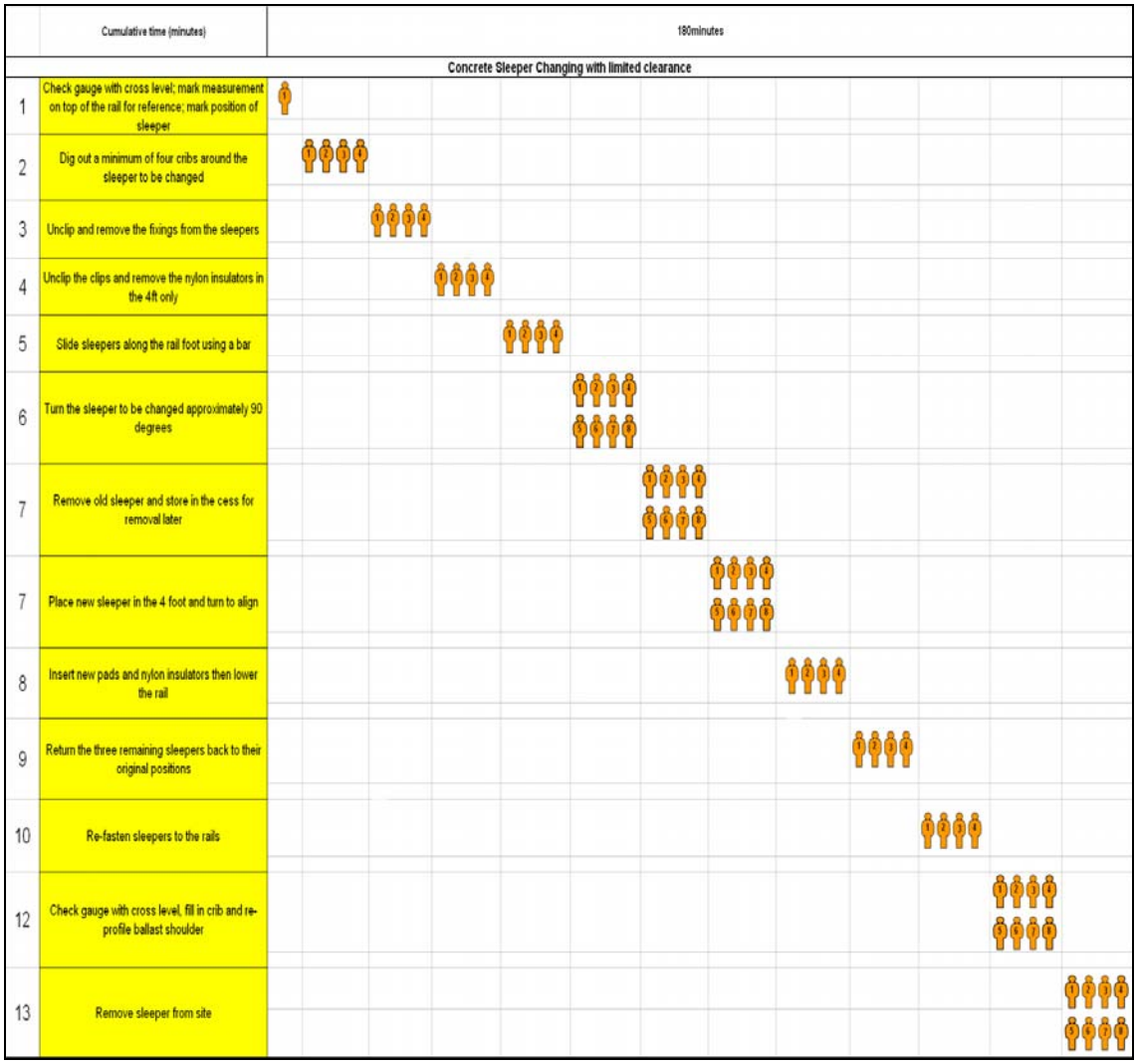
Delivery process for changing one sleeper without clearance

Planning and productivity

- Standard job ref – 009092
- MNT code - 003
- Norm time per sleeper – 5.73 hours
- Standardised Norm time per sleeper 3.0 hrs
- Labour Requirements – 8 staff



1. Check rail temperature and track gauge. Mark position of sleeper(s) to be changed or moved.
2. Lateral resistance plates or conductor rail pots must be removed and then reinstated after the new sleeper and rail have been reconnected.
3. A minimum of four cribs around the sleeper to be changed will need to be cleared of ballast.

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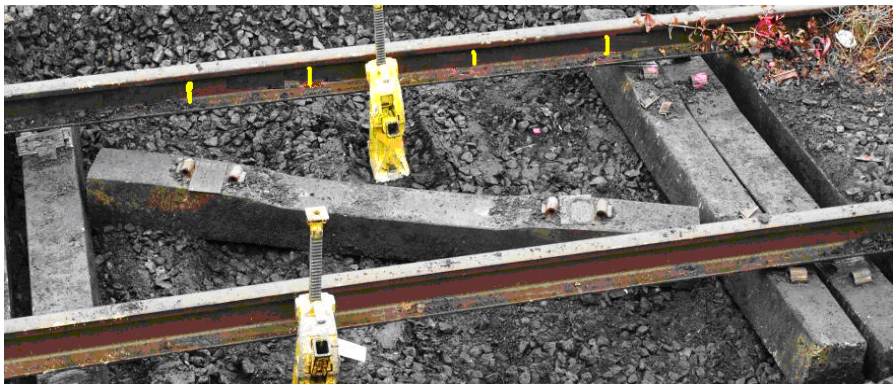
4. Unclip and remove the fixings from the sleeper(s) to be changed.
5. Unclip and remove the insulators from the 4ft side of the three adjoining sleepers – two on one side and one on the other side of the sleeper to be changed. This is so the sleepers remain connected to the rail but can easily slide along the rail foot using a bar.
6. Slide the unclipped sleepers along to their nearest fixed neighbour, so that the resultant gap in the 4ft is large enough to turn the sleeper by 90 degrees. Rotate the sleeper using heel bars and lift out between the rails. The rail may have to be jacked a small amount to allow the clip housings to slide underneath the rails.



7. Place the new sleeper in the 4ft and turn to align. Insert new pads and insulators then lower the rail, re-clip the rail and remove the jacks.
8. Return the three remaining sleepers to their original positions. Insert new pads and insulators and re-clip them to the rails.
9. Check gauge and top and amend as required, pack, then fill in the cribs and re-profile the ballast and ballast shoulders.

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Site clearance

Remove any scrap components and sleepers from site. If they are to be left for a scrap vehicle to recover, components must be stacked and banded together pending removal.

Check

If possible watch the track under traffic. If there is voiding on any of the moved sleepers, then lift and pack as required. A follow up inspection within 4 days is essential to confirm no excessive settlement.