

ANNEXURE 2- Universal sleepers and Infra bolts

MINIMUM REQUIREMENTS FOR INSTALLATION OF UNIVERSAL SLEEPERS WITH INFRA BOLTS

- 1.1 Once installed the bolts must be torqued to between 240 and 250 Nm and re-torqued a week after installation.
- 1.2 All bolts must be greased by applying anticorrosive grease over the whole length of the thread before installation (Caltex Rustproof Compound L Item Number: 09/038581).
- 1.3 A HDPE pads with a minimum thickness of 5 mm * must be used between the steel hardware and concrete sleeper. HDPE pad comes in a strip of 4.3 m long * 200mm wide and must be cut on site.
- 1.4 A Stumec and impact wrench may not be used for the installation of the bolts.
- 1.5 Prostruct 121 must be used at the bottom of the sleeper on the nut. 2 Litres should be sufficient to do a set. Once the epoxy is mixed it must be used within 30 minutes. The epoxy (Sealed kits) must under no circumstances be stored or placed in the sun.
- 1.6 Careful consideration should be given to make sure that provisions are made to fit the cradle for the points rodding and the two way indicator frame. The cradle may be fastened with a minimum of 3 Infra bolts provided that at least two of the bolts are prevented from turning by installing a locking plate or tag washers. Each contractor must submit his proposed method for approval to Technology Management. The following serve as a guideline on typical fastening methods.
 - 1mm Cromedeck flat plate with two bolt holes. The ends are bent up and knocked over to prevent the bolts from turning.
 - 18 mm Tag washer of suitable thickness and material.
- 1.7 Under no circumstances may the steel reinforcing be cut off. These holes must be left out.
- 1.8 Each sleeper must have a minimum overhang of 200 mm. i.e. The length from the side of the plate to the end of the sleepers shall not be less than 200 mm. The first hole in the sleeper must be at least 250 mm from the one side and 250+100 from the other side. This will allow for the re-use of the sleepers if new hardware is installed. On the stock and switch panel the 100 mm could be increased to 200 mm. If the sleepers are moved for the new steel hardware the old and new holes must be at least 100 mm apart.
- 1.9 If holes will be closer than 150 mm the one hole must be left out.
- 1.10 The holes in the HDPE pad must be between 26-30 mm.
- 1.11 Before coring the sleepers the sleepers must be aligned and positioned to make sure that the holes do not align with the reinforcing. The sleeper has small indents marking the position of the reinforcing within 15 mm. The hole must be cored at a 90 degree angle to the concrete surface with a maximum error of 3 degrees.
- 1.12 All possible bolts must be installed. See guidelines below.

Technology management is busy considering reducing the number of bolts. (Detail to follow)

 - Preferably all bolts on sleeper 1 to 6 must be installed. If not, a minimum of 3 bolts per rail seat must be installed provided, that this does not happen on consecutive sleepers
 - The bolts on the rails seats of the base leg "High leg" of the stock and switch must be as above
 - The rest of the set must have a minimum of 3 bolts on the 4 hole plates and a minimum of 2 bolts on the 3 hole base plates provided that the minimum number of bolts does not happen on consecutive sleepers.
 - Exceptions to the rules above provide for:
 - places where the holes are in the centre of the sleeper
 - skew plates causing holes to overlap on the reinforcing

- 1.13 In order to ensure that the turnouts can be measured accurately and be built to the correct gauge, the metal flow in the gauge corner (Overburden) of the rails should be removed by TRANSNET FREIGHT RAIL (TFR) prior to the Contractor arriving for measurement of the turnout.
- 1.14 The contractor shall only start work on turnouts, which can be repaired to the 'A' standard with the installation of the universal sleepers.
- 1.15 The holes in the steel hardware must be at least 24 mm. All holes smaller than 24 mm must be reamed to a maximum of 25 mm.
- 1.16 The steel washer at the top must be at least 6mm thick with a 4mm at the bottom of the assembly.
- 1.17 When welding needs to be done on the set the E clips and T bolts must be loosened and not the Infra bolt.
- 1.18 The "Infrabolts" system may only be used to fasten plates with a thickness of between 20 and 35 mm.
- 1.19 A grade 8.8 stud according to Nedschroef drawing P00M18008 must be used to fasten plate thicknesses between 35 and 50 mm.

Changes from the specification of 18 April 2006

- Prostruct 30/35 has been changed to Prostruct 121 which is a slow curing epoxy.
- Item 1.19 was added to allow for thicknesses between 35 and 50 mm.

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