PART C3.7

PARTICULAR SPECIFICATION

SUPPLY AND FIT UNIVERSAL CONCRETE TURNOUT SLEEPERS TO EXISTING TURNOUTS

PROJECT SPECIFICATION

1. SCOPE OF WORK

1.1 Replacement of turnout sleepers

1.1.1 The Contractor shall be required to replace existing turnout sleepers with new Universal Concrete turnout sleepers in accordance with the new Infra-bolt concept. Specific materials may either be supplied by Transnet Freight Rail (TFR) or by the Contractor. The preferred way of working shall be that universal sleepers and infrabolts are purchased and supplied against existing Transnet Freight Rail (TFR)-Supplier contracts. Different rates shall apply for Transnet Freight Rail (TFR)-Supply-Contractor-Fit as opposed to Contractor-Supply–Contractor-Fit but both may be required. The contract shall include for the pre-inspection, measurement for ordering, ordering, supply (where relevant) , expediting, co-ordination of material supply to site of installation of all universal sleepers, infra-bolts, HDPE pads, epoxy material and anti corrosive lubricant in a Transnet Freight Rail (TFR)-Supply-Contractor-Fit or alternatively Contractor-Supply–Contractor-Fit Contract, inclusive of all labour, equipment, and materials. The HPDE pads, epoxy and anti-corrosive lubricant shall in all instances be supplied by the contractor.

1.1.2 The Contractor shall be expected to rectify the geometry of each turnout, remove existing turnout sleepers, measure and core holes in new universal sleepers for fastenings, install universal sleepers as well as all tamping, alignment and ballast work. Replacement of sleepers shall be required for complete turnouts. This shall include all the non-standard sleepers at the back of the turnout beyond the EOS and EOT as well as the switchbox sleepers at the front. A standard sleeper shall imply a standard PY,FY,P2,F4,P84,P54 or “flat” pandrol sleeper.

1.1.3 On a 1:12 turnout the number of non-standard sleepers shall therefore be approximately 54 in number and a total length of approximately 161m of sleeper. The tender price per turnout for 1:12 shall be based on 135m for a 1:12 turnout. It is however possible that the total length of sleepers for any one 1:12 turnout project may approach 200m. Adding or subtracting sleepers at the tendered unit price per metre will then make corrections for actual length replaced per turnout.

1.1.4 On a 1:9 turnout the number of sleepers shall therefore be approximately 43 in number and a total length of approximately 135m of sleeper. The tender price per turnout for a 1:9 shall be based on 100m for a 1:9 turnout. It is however possible that the total length of sleepers for any one 1:9 turnout project may approach 175m. Adding or subtracting sleepers at the tendered unit price per metre will then make corrections for actual length replaced per turnout.

1.1.5 On a 1:7 diamond crossing the number of sleepers may be approximately 120 in number and a maximum total length of approximately 290m of sleeper. The tender price per 1:7 diamond shall be based on 290m sleepers for a 1:7 diamond crossing. Adding or subtracting sleepers at the tendered unit price per metre will then make corrections for actual length replaced per turnout. The longest sleeper to be replaced shall not exceed 6m.

1.1.6 The Sleeper replacement on both 1:12 (standard and self normalizing) as well as 1:9 turnouts may be required. Rail mass of the turnouts shall be 48/57/60kg.

1.1.7 Repairs to existing concrete sleeper turnouts by replacement of individual damaged concrete sleepers will also be required on a limited scale.

1.1.8 Details of the turnouts for which the sleepers are required to be replaced with Concrete Universal Sleepers are contained in Annexure 1. This will be the workload for the contract.

1.2 Universal Concrete Sleeper.

1.2.1 Only one type of sleeper in a variety of lengths up to 6m will be required to be handled and installed i.e. existing turnout sleepers to be removed and replaced with Universal Concrete sleepers. Reference to this sleeper shall mean a Universal Concrete Sleeper for which the positions of bolts for the fastenings are to be measured on each sleeper for each turnout of which the sleepers are to be replaced.

1.2.2 Strict adherence at all times to the Transnet Freight Rail (TFR) Installation Procedure for Universal Sleepers will be required. **See Annexure 2.**

1.2.3 These measurements shall be made after the Contractor has rectified to the geometry of the turnout within the A-standard. Rectification of the geometry shall include vertical and horizontal alignment, gauge and sleeper spacing.

1.2.4 These measurements shall then be used as follows:

1.2.4.1 The Contractor shall use these measurements to core holes in the Universal Sleepers to receive infra-bolts at all designated positions in accordance with the Installation Procedure contained in **Annexure 2**.

1.2.5 Each Transnet Freight Rail (TFR) depot shall be responsible for replacing worn and or damaged parts on the steelwork, buttresses, chairs, blocks, bolts etc. of each turnout before repair to the geometry of the turnout by the Contractor starts. The contractor by means of the pre-inspection report shall point out to the depot the requirements for replacement of worn parts which may affect his ability to deliver quality in accordance with the specifications.

1.2.6 If the steelwork or any part thereof of a turnout handed to the Contractor by a depot for replacement of sleepers is not in such a condition as to allow the Contractor to complete the work to within the A-standard then the Contractor shall refuse to proceed with any work on that specific turnout. In such an event the Project Manager must be advised immediately.

1.2.7 The repair of the geometry of each turnout shall be an item, which shall be separately priced per turnout.

1.2.8 The pre-inspection and measurement of each turnout shall also be an item, which shall be separately priced per turnout.

1.2.9 The removal of existing sleepers and installation of the Universal Concrete sleepers shall also be an item, which shall be separately priced per turnout.

1.2.10 The screening of the ballast on a turnout prior or after installation of sleepers shall also be an item, which shall be separately priced per turnout. This item is included as an Option which may or may not be awarded as part as the tender.

1.2.11 The installation of standard flat Pandrol sleepers on a turnout together with installation of universal sleepers shall also be an item, which shall be separately priced per turnout. This item is included as an Option which may or may not be awarded as part as the tender.

1.2.12 The transport by road of blank universal sleepers and bolts from suppliers to the station nearest to point of installation in the event of non-availability of rail wagons is included as an Option which may or may not be awarded as part as the tender.

1.2.13 The ordering, expediting and co-ordination of all material for purpose of ensuring timeous supply of sleepers, bolts, sleeper pads, anticorrosive lubricant, epoxy and other consumables to site shall be priced separately and not included as part of other rates. This shall be applicable irrespective of whether road or rail transport is used.

1.2.14 The off-loading of sleepers and bolts from long distance transport at destination shall be separately priced and not included as part of other rates. This shall be applicable irrespective of whether road or rail transport is used.

1.2.15 The secondary handling i.e. loading, transport and off-loading, for final distribution from point of off-loading from long distance road or rail transport to point of actual installation shall be separately priced and not included in other rates. This shall apply when physical layout of a site is such that it is not possible to off-load sleepers and bolts from the long distance road or rail transport within 500m from point of actual installation. This secondary handling shall be associated with a free haul distance of 25km. If the transport distance for secondary handling exceeds 25km then an extra over rate per km for the distance beyond 25km shall apply.

1.2.16 The rate for secondary handling of material shall cover and include for the removal of released material to the same point from where the new material had to be distributed.

1.2.17 The stacking or loading in wagons/trucks of released materials shall be included in the rates tendered and no separate payment shall be made.

2 NATURE OF WORK

2.1 This contract covers replacement of existing wood- and concrete turnout sleepers and the removal of released material to designated storage sites at stations nearest to sites of installation, on all lines owned or operated by Transnet Freight Rail (TFR).

2.2 The contractor will be required to work “between trains” occupations which shall include periods of “total” occupations of not more than 2 hours duration each. Several such “total” occupations may be granted per day. Normal protection measures in accordance with the Protection Manual shall apply.

2.3 Transnet Freight Rail (TFR) shall provide Free on Rail (FOR) rail transport for the supply of the blank universal sleepers, infrabolts from suppliers to the station nearest to point of installation in accordance with the Contractors programme. The Contractor shall unload and transport the new sleepers and infrabolts to point of installation and perform the complete process of replacement which shall include boxing out of ballast, loosen existing fastenings, removing the existing sleepers, rectifying geometry, measuring fastening positions, coring for infra-bolts and install the new sleepers and fasten the rails to the sleepers, all ballast work, lift, align, tamp to the A-standard and restore ballast profile to correct standard and remove the released material from section to be stacked at a designated site or loaded into DZ type trucks at nearest station.

3 HOURS AND DAYS OF DUTY

3.1 Work shall proceed during weekdays from 07h00 to 17H00. Over-time, work on public paid holidays, Saturdays and Sundays shall only be required in exceptional cases.

3.2 Work outside of normal working hours shall not be paid against overtime rates unless:

3.3 Agreed upon by the Technical Officer in writing before the start of the any project.

3.4 The contractor can prove Transnet Freight Rail (TFR)'s accountability for delays resulting in overtime being required.

3.5 Work shall proceed under "between trains occupation" which shall include periods of "total occupation" of not more than 2 hours each. When work is executed under "between trains occupation" work shall proceed in such a way that normal rail traffic can be allowed, on short notice, to pass safely over the work site at a speed of 30km/h.

3.6 The Contractor shall provide for sufficient resources to complete the replacement of all the sleepers of one 1:12 (up to 200m of sleepers) or 1:9 (up to 175m of sleepers) turnout within one workday without the use of overtime.

3.7 Performance of work after hours and on weekends or public holidays will normally not be required but may have to be done in specific circumstances and subject to the discretion of TFR.

4 STANDARD OF WORK

4.1 Replacement of sleepers.

4.1.1 The Contractor shall ensure that on completion of the work the turnout and adjacent track complies with the "A" standard.

4.1.2 The Contractor shall work to the layout dimensions required by the Technical Officer. These dimensions will be given in writing to the Contractor or indicated by means of chalk marks on the sleepers.

4.1.3 The Contractor shall monitor and evaluate measurements of the layout and shall ensure compliance with the specified standards of workmanship and accuracy during installation of the sleepers.

4.1.4 Where, in the opinion of the Contractor, the condition of the site or turnout steelwork is such that the specified performance standards cannot be achieved, he should not proceed with doing any work on the turnout. The Contractor shall record all relevant information in conjunction with the Technical Officer and immediately report it to the Project Manager or delegate. The Project Manager or delegate may, if he concurs with the Contractor's contentions, adapt the specified standards of workmanship in order to suit the track and/or site conditions in order to allow the work to proceed on that particular turnout.

4.2 Track formation.

4.2.1 Track formation shall not be damaged or it's profile changed by work carried out by the Contractor.

4.3 Geometric and Material standard.

4.3.1 On completion of sleeper replacement, turnouts shall comply with the "A" standard.

4.3.2 Diagrams indicating measurements to determine the geometric standard of turnouts are included in The Rules Books for the Building of Turnouts, Manual for Track Maintenance (2000) and the E10 Specification for Track Work

4.3.3 Each turnout shall in turn also comply with the material and procurement specifications as contained in the Installation Procedure (Annexure 2) as supplied by Transnet Freight Rail (TFR).

4.4 General

4.4.1 The distance between track centerlines on multiple tracks must be within 10mm of the design centers. If slewing is required this must be agreed in writing between the Contractor and the Technical Officer prior to work starting on the turnout.

4.4.2 The standard for structure gauge shall be adhered to specification E7/1 (July 1998).

4.5 Sleepers

4.5.1 The position of each sleeper shall be marked out with permanent paint on the field side of the rail flange. These markings will be used for quality measurements afterwards.

4.5.2 Sleepers spacing in accordance with the "A" standard shall not vary by more than 5mm where it was subjected to the Contractor's discretion.

4.6 Ballast.

4.6.1 The top width of the ballast shoulder to the "A" standard shall be constructed to a tolerance of +100mm and -50mm.

4.6.2 The depth of the ballast profile shall be within a tolerance of +50mm and -50mm.

4.7 Signal equipment.

4.7.1 The contractor shall not interfere or tamper with signal equipment on turnouts or signal equipment next to the track.

4.7.2 In the event of existing signal equipment hindering the execution of the works, the contractor shall timeously advice the Depot Engineer in writing of his requirements in order for qualified signalling personnel to provide the necessary assistance.

4.7.3 Special care shall be taken by the contractor not to cause an electrical short circuit across the two running rails of the track in any position during replacement of the sleepers.

4.8 Electrical equipment

4.8.1 The contractor shall not interfere or tamper with any electrical equipment on turnouts or electrical equipment next to the track.

4.8.2 Since the traction rail forms part of the high voltage electrical circuit, any break in the track could result in the full system voltage (up to 50 000 volts) between rail and earth under certain conditions. The Contractor when encountering any such situation shall therefore exercise special care and the Depot Engineer shall be advised without delay.

4.8.3 Because sleepers will be replaced under life overhead conditions the following precautionary measures will be required to ensure the safety of persons on site against the risk of electric shock by availing his staff for safety induction, training in Electrical Awareness, PWC and Competency Training by TFR:

The Contractor shall not proceed with any work before having ensured that all his staff is competent and qualified to work adjacent to, under or near live OHTE. The contractor shall properly informed and warn all his staff of potential dangers of adjacent live equipment pointed out to him by the Transnet Freight Rail (TFR) electrical officer. The Contractor shall specifically ensure that no person or equipment or any part thereof ventures within 3 (three) meters from such life equipment.

5 MEASUREMENT OF QUALITY OF CONSTRUCTION

5.1 Where the "A" Standard work is required, the following measurements of quality of construction shall be required.

5.2 The Contractor shall measure and record for each turnout all measurements required to determine the standard of construction. A hard copy of these measurements shall be made available to the Technical Officer on completion of the work for evaluation purposes.

5.3 Measurements for the vertical alignment and gauge shall be made with a Geismar type track gauge or equivalent.

5.4 Deviations from straight line (slack): Determine position of the slack by visual means. Measure the depth of the slack with a Geismar type track gauge. Measurements shall be taken along the top of the rail also before and after the points of deviation.

5.5 Measurement for the horizontal alignment shall be made with a nylon line on the running side of the reference rail at two points 10m apart and a feeler gauge calibrated 1mm intervals.

5.6 On the straight track, each deviation between the two points 10m apart must be measured by inserting the feeler gauge between the nylon line and the rail at the center of the deviation. The number of sleeper spaces between the beginning and end of the deviation must be recorded.

5.7 Curved track shall be marked out at 5m intervals and each mark shall become a measuring station. Measuring and recording the offset at each station from the 10m chord strung across alternative stations shall determine the Final Standard.

5.8 The measuring stations specified above shall be numbered consecutively on the flange of the left hand rail with white chalk for each section being evaluated and shall be prefixed with the letter A.

5.9 Ballast standards shall be determined by:

5.9.1 Open and measuring actual ballast depth where directed by the Technical Officer.
5.9.2 The ballast profile shall be measured by approved means along the track and recorded.

6 RECTIFICATION OF SUB-STANDARD WORK

6.1 Where the specified standards of workmanship and accuracy are not attained within the period of an occupation, the Technical Officer will arrange to rectify the defects to allow the temporary safe passage of trains and will recover from the Contractor the cost, at departmental rates, of all the resources utilized.

6.2 Departmental rates shall be the labour rates and vehicle tariffs listed in clause 6.3 as well as material prices applicable at the time of deduction from the payment certificate.

6.3 These Transnet Freight Rail (TFR)'s rates will be as below. Labour rates will be enhanced by 33% for Saturdays and 100% for Sundays and paid public holidays.

6.3.1	Artisan/Trackmaster	=	R90,00/hr	
6.3.2	Skilled labour	=	R50,00/hr	
6.3.3	Unskilled labour	=	R30,00/hr	
6.3.4	L.D.V.	=	R 10,00/hr	excluding driver
6.3.5	Lorry	=	R 60,00/hr	including driver

7 MATERIAL UNLOADED BY THE CONTRACTOR

7.1 The Contractor shall unload, distribute, and stack permanent way material supplied for the works at places designated by the Technical Officer. The Contractor must keep record of such receipts, indicating rail truck numbers and the date of unloading. The Contractor shall accept responsibility for safe custody of the material only from the time the material is handed over into his custody by Transnet Freight Rail (TFR) at the station nearest to the site just prior to commencement of the work.

8 RELEASED MATERIAL

8.1 General

8.1.1 The Technical Officer will classify all materials to be released and arrange for the rail or road trucks required for loading of released material.

8.1.2 Released permanent way material shall be broken up into its basic components, and shall be grouped into types for loading, or stacking. Clips shall not be loaded onto the same truck as sleepers. Pads shall be placed in approved type bags when loaded together with pins in the same truck, etc.

8.1.3 Losses shall be kept to a minimum. Any material to be scrapped shall be collected in material camps and disposed as directed by the Technical Officer.

8.1.4 Re-usable material loaded into trucks for dispatching shall be neatly stacked in such a manner that:
8.1.4.1 Re-usable material is not damaged during the loading operation.
8.1.4.2 The journey to it's destination may be made with no damage to the material or shifting of the load; and
8.1.4.3 The unloading by others at its destination may be undertaken without difficulty.

8.1.5 Fastenings
8.1.5.1 Released fastenings shall be grouped together prior to loading by binding wire, sturdy bags or any similar approved method.

8.1.6 Loading and stacking records.
8.1.6.1 The Contractor shall keep record of all materials loaded into trucks or stacked for dispatching. The lists reflecting the full contents of each truck or stack shall be submitted to the Technical Officer.

9 OTHER SPECIFICATIONS APPLICABLE

9.1 The documents forming the contract are to be taken as complimentary to each other. In case of any discrepancy or inconsistency between contract documents, the order of precedence will be:

9.2 Project specification, together with particular drawings, schedules of machines and schedules of prices.

9.3 Standard specifications E7/1(1998) – Specification for works on, over, under or adjacent to railway lines and near high voltage equipment.

9.4 E10 - Specification for Railway Track Work.

- E10 Gen : Preliminary and general
- E10/1 : Laying of rails
- E10/2 : Laying of sleepers
- E10/3 : Ballast cleaning
- E10/4 : Ballasting and tamping
- E10/6 : Building and replacement of sets
- E10/9 : Slewing and alignment
- E10/10 : Drain cleaning

10 INFORMATION REQUIRED FROM THE CONTRACTOR IN TERMS OF THIS CONTRACT

10.1 Bill of Quantities.
10.2 Description of method of operation.
10.3 Completed labour schedule.
10.4 Work program
10.5 Completed schedule for rate of operation

11 SCHEDULE FOR RATE OF OPERATION.

11.1 Repair Geometry in accordance with relevant specifications for the entire turnout applicable to the Infra bolts process. The actual total time worked to complete the operations will be as in the table below.

11.2 Remove all existing sleepers on an entire turnout (Unrestricted Site Access). Measure fastenings positions, core new universal sleepers to receive fastenings and install new concrete sleepers including, all ballast work, lift, align, tamp, restoring ballast profile and drainage. The actual total time worked to complete the operations will be as in the table below. See clauses 1 and 2 and 7 and ITEM 2 of Bill of Quantities.

SCHEDULE FOR RATE OF OPERATION (REPAIR GEOMETRY)

PROCESS	DESCRIPTION OF TURNOUT	RATES (MINUTES TOTAL OCCUPATION)	RATES (MINUTES BETWEEN TRAINS OCCUPATION)
INFRA BOLTS	1:9 - 48/57/60KG		
INFRA BOLTS	1:12 - 48/57/60KG		

WORKING TIME TAKEN TO COMPLETE TOTAL OPERATION
(Finalize track to A-standard, travelling time excluded)

SCHEDULE FOR RATE OF OPERATION (REPLACE SLEEPERS –UNRESTRICTED SITE ACCESS)

PROCESS	DESCRIPTION OF TURNOUT	RATES (MINUTES TOTAL OCCUPATION)	RATES (MINUTES BETWEEN TRAINS OCCUPATION)
INFRA BOLTS	1:9 - 48/57/60KG		
INFRA BOLTS	1:12 - 48/57/60KG		

WORKING TIME TAKEN TO COMPLETE BETWEEN TRAINS OCCUPATION OPERATION
(Finalize track to A-standard, travelling time excluded)