PARTICULAR SPECIFICATION FOR MAINTENANCE OF PERMANENT TRACK WIT ONE ON-TRACK BALLAST TAMPING MACHINE (PLAIN TRACK)

CONTENTS

PARTICULAR SPECIFICATION FOR MAINTENANCE OF PERMANENT TRACK WIT ONE ON-TRACK BALLAST TAMPING MACHINE (PLAIN TRACK

1. SCOPE:

1.1 Nature of work

This Contract includes the maintenance of track by the Contractor with a high production, heavy duty, and on-track ballast-tamping machine. A dynamic track stabilising machine will be required to work with this machine.

Tenders are required for a high production, heavy duty, on-track ballast-tamping machine on the Iron ore line. A ballast Stabiliser is required to work with the tamper. The machine shall be capable of tamping rate equal or in excess of 50 sleepers per minute.
The contract shall be limited to such a period as to not exceed the value of R2m
The price offered shall include for all fuels, maintenance, operation, accommodation and transport of staff, flagmen and support staff and transport and hand tools required to optimally operate the Tamper and stabiliser.
All operation shall comply with the requirements as set out in the following attached documents so far as they are applicable to this contract:

The stabiliser shall have ballast-regulating blades to regulate the shoulders of the ballast profile. These shoulder ploughs shall be individually controllable from the operators cabin. The transfer of ballast will not be required.

1.2 Contract area

The Contract area will be the track on the TFR Iron Ore line. Service Manager may however require the machine to work outside the contract area.

1.3 Duration of contract

1.3.1 Commencement date of contract.
The Contract is required to start as soon as possible. The staring date of the contract shall be as stated in the letter of acceptance of tender. The Tenderer shall specify in his tender submission the earliest commencement date.

The Contract period shall be limited in period so as to not exceed the maximum value of R2000000.

2. DEFINITIONS

The following definitions shall apply:

SINGLE TAMP. A tamper passes over the track and tamps every sleeper once.

DOUBLE TAMP. A tamper passes over the track and tamps every sleeper twice in succession. For every tamp the tines are lifted clear of the ballast.

SINGLE PASS. A tamper passes over the track once and tamps every sleeper (single or double tamp).

DOUBLE PASS. A tamper passes over the track, tamps every sleeper (single or double tamp), returns with tines in the raised position and again passes over the track, tamping every sleeper (single or double tamp).

SINGLE ADVANCE. A double header tamper tamps every sleeper twice in succession, whilst advancing only one sleeper at a time.

TAMPING POSITION. Each side of every sleeper-to-rail fastening.

3. TYPE OF MACHINE REQUIRED:

3.1 Tamping functions:

3.1.1 The machine shall be able to tamp plain track with a gauge of 1065 mm and all joint assemblies. Signalling and electrical equipment such as axle counters, cables, bonds and connecting rods will not be removed. Bonds and cables will not be removed unless connections are bolted to the rail. Bolted connections shall be replaced by the Contractor after the tamping operation.

3.1.2 The Contractor shall specify and state in his submission, for each option tendered for:

a) The optimum tamping process (application of: Hydraulic pressure range, tine vibration frequency, squeeze time, tine amplitude, tine size and tamping depth below the sleeper in clean and fouled ballast), that will ensure long-term durability of the track geometry.
b) The variation in design sleeper spacing the machine can handle.
c) The variation in constancy of a design sleeper spacing that the machine can handle.
d) The variation from square that the machine can handle.
e) The conditions under which the tamper may move sleepers and what is required to ensure that this is not done.
f) What minimum radius the machine can tamp.
g) Any other limitations or technical requirements applicable to the machine.

3.1.3 Design sleeper spacing for Transnet Freight Rail General Freight lines vary from a design of 750mm spacing down to 500mm spacing on curves. Spacing and sleeper type also varies at block joints and other joints. The major portion of Transnet Freight Rail GFB track where this machine will be used has a sleeper spacing of **700 mm**. For the purpose of this tender, it may be assumed that 85% of the track to be tamped will have this **700 mm** sleeper spacing.

3.1.4 The machine shall be capable of lifting the track up to 100mm per pass and of slewing the track up to 50mm per pass.

3.1.5 The machine shall be capable of tamping between 230mm and 440mm below rail level with the top of the tines adjusted to be 10mm below the underside of the sleeper.

3.1.6 The squeezing time shall be within a range of 0.8 to 1.0 seconds

3.1.7 The tamping assembly of one sleeper shall consist of at least 16 tines. Individual control of the tamping assembly of each rail must be possible. Tenderers may offer machines of a different tine configuration.

3.1.8 The method of tamping shall provide an equal positive horizontal force to opposing tines. The tines' vibration frequency shall be between 35 and 60 Hz with amplitude of about 10mm. The closing force shall be applied hydraulically to the tines and the system shall be fitted with an adjustable pressure control. Pressure gauges shall be fitted in such a way that they can easily be monitored by the Supervisor's deputy.

3.1.9 The machine shall lift the track, tamp the ballast under the sleeper(s) and align the track to an automatically determined line and level, in one continuous action.
The tamping cycle shall be automatic. Once initiated by the operator, the closing and extraction of the tines and synchronisation thereof with the track lifting and levelling operations shall follow automatically. By-pass switches to engage manual operation will not be permitted.

3.1.10 Each tamping tine's tip size (frontal surface area) shall not be less than 7000 mm², using 16 tines / sleeper or 9000 mm², when using 8 tines / sleeper.
Measurement shall be by using a flexible non-elastic O-ring with suitable diameter (to be agreed with the Engineer - according to the tine's wear-pattern) or by calculation from a trace on graph paper. The Contractor shall at all times have the appropriate wear gauges on the machine.

3.1.11 The machine shall have automatic lifting and lining systems for use on all track and in addition shall have "design" lifting and lining instruments for use on tangent track. The contractor shall move, position and align the instruments to beacons provided by Transnet Freight Rail. The non-availability of the design lining system will render the machine non-available. The design lifting and lining instruments shall be repositioned during Ts (Standing time caused by Transnet Freight Rail). Tenderers shall quantify under what condition alignment equipment cannot function accurately (i.e. Laser in misty/windy conditions)

3.2 <u>Mechanical and motive aspects</u>

3.2.1 Off-tracking equipment will not be required.

3.2.2 The machine shall be capable of maintaining an average travelling speed as required in the schedule of machines.

3.3 PREPARATION WORK FOR TAMPING OPERATION

3.3.1 The Contractor shall open up level crossings in front of the machine and restore it after tamping. Tarred level crossings will also be opened up and restored with gravel by the contractor. Where required, Transnet Freight Rail will arrange, beforehand, with the road authority, for permission for the opening up of the tarred level crossing and for the final repair of the paved part thereof. An inspection of the level crossing, including the cattle guards, shall be done before work and thereafter. A list of material needed shall be handed to the Supervisor's deputy. Only if the level crossing has been restored correctly, shall each level crossing, including the cattle guards, be signed off by the Supervisor's deputy. This shall be done within 48 hours after being opened. Appropriate traffic warning and control measures shall be taken by the contractor for the period when a level crossing is opened.

3.3.2 The Contractor shall remove all track lubricators and, where applicable, lubrication mats, in front of the machine and replaces them after tamping. Replacement ties for mats will be supplied by Transnet Freight Rail where applicable.

3.3.3 The Contractor shall measure and evaluate curves to be tamped, to help him restore the track to the initial design standard or to a new design decided upon by the Supervisor. Curve beacons, indicating the beginning and end of circular and transition curves, shall be replaced and fixed by Transnet Freight Rail according to the latest design.

3.3.4 The Contractor shall also be responsible for the preparation work with regard to the stability of the track to be tamped. Material replacements to be done by the Contractor shall be limited to that which is required to ensure a proper tamping job. The Supervisor or his deputy shall inform the Contractor one-month in advance, of what work shall be required and what material will be provided. This work may include the boxing in of ballast within the capacity of the permanent labour provided for in the contract and as listed in the schedule of labour as required per clause 3.3.5

3.3.5 The labour, supervision and vehicle normally required to do the work as required in clause 3.3.1 to 3.3.4 must be listed in the "Schedule of labour and plant for preparation for tamping." The Contractor shall provide the labour with the necessary hand tools such as measuring equipment, beaters, forks, spanners, bars and levers for sleeper clip and spring fastenings. This labour shall be utilized fully for all work related to the items listed above.

All the Contractor's staff on or near the track shall at all times, wear reflective clothing similar to that worn by Infra Maintenance's own staff.

3.3.6 Where the volume of work required as per clauses 3.3.1 to 3.3.4 exceeds that what can reasonably be done by the labour listed in the schedule as per clause 3.3.5, the Supervisor may request the Contractor to provide additional labour and / or supervision and transport for the execution of the additional preparation work. Additional supervision and transport will only be requested where the additional labour exceeds three men. This additional labour shall also be provided with the necessary hand tools such as measuring equipment, beaters, forks, spanners, bars and levers for sleeper clip and spring fastenings. This additional labour, supervision and transport will be paid for separately under item 9 of the schedule of prices (Day labour).

3.3.7 Additional work required by the Supervisor may also be done by the labour specified in clause 3.3.5, as overtime, separate from the machine occupation time and paid for under item 9 of the schedule of prices. (Overtime payment for labour under item 9 cannot be paid when overtime is paid for under item 4 or item 5 of the schedule of quantities and prices)

3.3.8 Reasonable work volume for the labour as specified in clause 3.3.5 will be agreed on between the Contractor and the Supervisor. (Man hours for each separate labour task)

3.3.9 Flagmen for the protection of the machines: The **Contractor shall provide**, as part of the machine operating cost, two flagmen. The flagmen shall be equipped with two-way radios, linked to a third radio at the tamper. The flagmen shall also be equipped with all the necessary flags and reflective clothing. Transport to the work site, transport to the placing position and removal of the flagmen after completion of the shift, shall be the Contractor's responsibility. Instruction for the day of the method of protection and control of flagmen during the occupation will be the responsibility of the Transnet Freight Rail "officer-in-charge of the occupation". (Track master or Track Inspector)

Detonators shall be provided by Transnet Freight Rail. Control of the use and training in the safe handling of detonators will be required. Training of the flagmen can be arranged as specified in clause 3.6 of this specification, through the Supervisor. The effective functioning of the flagmen must be monitored regularly.

3.4 TRACTION AND SIGNAL BONDS

3.4.1 All bonds / cables damaged or broken off during tamping shall be repaired by the Contractor during the period of the occupation.

3.4.2 The technician or trade hand used to do the bond repairs shall be properly trained and shall ensure that only those bonds which he is allowed to work on, be repaired by him. Certain bonds and damaged cables (Signaling and Electrical (Red bonds)), may only be repaired by a Transnet Freight Rail technician.

3.4.3 The contractor shall provide the required equipment to repair bonds. (Drill, reamers huck-bolt machine etc.)

3.4.4 The Contractor must arrange with Transnet Freight Rail for material (bolts, cables, etc.) before the start of the contract. Thereafter Transnet Freight Rail shall supply all the material required for repairing of broken bonds and cables on a one-to-one exchange basis (used material for new material) according to a schedule prepared well in advance.

3.4.5 The Contractor shall report daily to the Supervisor's deputy, the mast pole number and location of all bonds / cables damaged or broken off during tamping, that could not be repaired, or not repaired to the required standard.

3.4.6 No new cad-welds will be allowed on any rails. All repaired bonds shall be either huck-bolted or bolted. The method of bonding shall be an approved method for the line and rail involved. The position of the bond to the rail shall also be to Transnet Freight Rail specification to ensure being clear of any lifting wheels of on-track machine.

3.5 QUALITY MEASUREMENTS and Production measurements.

3.5.1 Quality measurements for Geometry are to be done by the Contractor behind the tamper for option A and behind the stabiliser for option B. The purpose of the quality measurement shall be:

- To ensure that track is safe before the passage of the next train,
- To ensure that the machine works to the specified standard.

Measurements shall be done in an automated continuous way. The type of data parameters required shall be in accordance with Appendix C. The Measurements shall continuously be visible as the machine progresses. A hard copy of exceptions to the required standard and **high-lighted** minimum safe standards shall continuously be recorded and printed. The hard copy shall be made available to the Transnet Freight Rail representative at the end of each day that the work has been performed.

3.5.2 The measurements that exceed the required standards shall also be recorded and provided in an **electronic format**. Where the contractor wants to do measurements by hand, the measurements deviating from the specified standard shall be recorded electronically. The Contractor shall specify in his tender submission clearly what method he intends using for the quality control measurement.

3.5.3 The standards for structural gauge shall be adhered to (See specification E7/1). The Contractor shall verify the structural gauge parameters himself and adhere to the specified standards.

3.5.4 The height of the contact wire shall be measured on both sides of overhead bridges as well as level crossings after the final tamp. Heights below or above the allowable limit quoted in specification E7/1 will be unacceptable.

3.5.5 The stagger of the contact wire (offset from the perpendicular on the track center line) shall be **monitored** at all support structures, pull-off and knuckle points, as well as at mid-span on all curves, after the final tamp. Where more than one contact wire exists, the stagger of the inner most wire shall be measured. The contractor shall **only record** the stagger where the specified limit is **exceeded**. (Outside required and emergency)

3.5.6 Contact wire height and stagger measurements exceeding allowable limits shall be reported to the Supervisor's deputy in writing (or computer printout) at the end of each shift. Measurements exceeding the maximum allowable limits quoted in specification E7/1 shall be immediately reported to Transnet Freight Rail for rectification or adjustment by Transnet Freight Rail electrical staff. Each measurement shall indicate the mast location number as well as the relevant track section number.

3.5.7 The tenderer shall qualify his tender as to what method shall be used for the control of the contact wire height and stagger.

3.5.8 Record shall also be kept of the sections of track where:

a) Track is tamped and double tamped.
b) Tamping is affected due to hard or dirty ballast.
c) Insufficient ballast is found to ensure lasting tamp alignment.
d) Other specific related data that may be required. (to be agreed on between the Service Manager and the Contractor.)
e) This data linked to the sections must be tabled in a Microsoft compatible electronic format (Excel) and be made available electronically to the Supervisor and Service Manager on a regular basis.

3.6 Training.

3.6.1 General.

a) The Contractor shall ensure that all staff working on or with the contract is adequately trained, so as to comply with any relevant safety and quality requirements.

b) It is the Contractor's responsibility to ensure that his staff is trained. At the commencement of the contract, Transnet Freight Rail shall assist the contractor with the initial on-the-job training for the staff as specified below, so as to assist the Contractor to qualify the worker's / staff. The Contractor shall ensure that he has a core group of workers with sufficient previous experience to take the lead in undertaking maintenance tasks.

c) Where training is required by the Contractor and Transnet Freight Rail is committed to provide training, the contractor shall qualify his tender as to what and how many staff, training will be required for. After award of the contract, the contractor shall then arrange with the appropriate Transnet Freight Rail Perway Production manager, through the Supervisor, for this training / testing.

3.6.2 Track maintenance (Workers):

At the commencement of the contract, assistance with the training, to qualify the Contractors workers to perform the following tasks shall be given:

a) Track work as mentioned in clause **2.6** (General track maintenance tasks e.g. Level crossing blocks, cattle guards, sleeper & Clip replacement / fastening, lubricators, flagmen, ballast boxing etc.)
b) Quality measurements as required.

3.6.3 Training of Track Inspectors, Track Masters and or Trade hands (Perway):

a) This training shall be solely the responsibility of the contractor. Only fully qualified people shall be used by the Contractor for these positions. The Contractor shall ensure that staff used, do comply with requirements for the industry.

b) The Contractor's Track Master/Track Inspector shall take full charge of the Contractor's resources on the work site. An employee/agent appointed by the contractor, will not act as, or be allowed to take on any responsibility as, the ***person-in-charge-of-the-occupation.*** The function of ***person-in-charge-of-the-occupation*** is restricted to competent Transnet Freight Rail employees only.

c) The ***person-in-charge-of-the-occupation*** *for an on-track machine* shall be a competent **Transnet Freight Rail employee**, reporting to the Transnet Freight Rail Depot Engineer. This person shall be responsible for the following on a work site:
- Taking occupations
- Placing and controlling the flagmen
- Declaring the track safe for the passage of trains
- Cancelling the occupation and recalling the flagmen
- Communication with train traffic control with regard to occupation matters.
- The issue and control of all flags and detonators

3.6.4 Training of Flagmen:

a) ***Flagmen*** used, may be either Transnet Freight Rail employees or employees of the Contractor. For this contract, the contractor shall supply the flagmen.

b) Where flagmen are required to be provided by the contractor, the appropriate training for the flagmen can be provided by Transnet Freight Rail at the start of the contract.

c) Where Transnet Freight Rail requires flagmen to be trained, the pre-requisites for such persons to qualify to be trained, shall be basic literacy skills and Basic English language ability.

d) ***Flagmen*** must be officially trained, evaluated and certified competent, (Transnet Freight Rail 407 – Item Number 37/270451 - "Certificate of Competency") by a designated competent person, before being used on protection duties. This certificate of competency shall remain valid for one (1) year only after which re-testing and re-certification of competency will be required.

e) In cases where a person was not performing flagmen duties for a period of 6 months or longer, he must be re-tested and again be re-certified competent, before he may be re-used for Protection Duties.

f) The Transnet Freight Rail Depot Engineer remains ultimately responsible in terms of the requirements of Act 85 for the safe working environment of his own personnel as well as contractor's personnel within the track maintenance environment on his depot.

The Depot Engineer is therefore also responsible for ensuring that any changes in the Protection Procedures that may occur over time are effectively communicated to any flagmen prior to them being used for Protection Duties.

3.6.5 Training of bonders.

Bonders removing, replacing or repairing damaged bonds, shall be trained to ensure that only work which they are trained and allowed to do, is done by them.

The initial initialization training of bonders can be arranged for with the Transnet Freight Rail accredited electrical trainer, through the Supervisor. (Refer note in clause 5.6. (d) For arrangement of this training.)

3.6.6 Electrical awareness, Educational and Competency training:

a) The following training shall be arranged for the following Contractors staff:

Course	Objective	Duration & trainer	Grade to attend
A) **Awareness** (Electrical)	To inform all contractors staff working near a machine and on the line on electrified sections of the dangerous situations of high voltage OHTE	Two hour on-the-job lecture and training. **Accredited Electrical trainer / Depot's Electrical Supervisor.**	• All workers and staff working on the contract
B) PWC **Educational** (Electrical)	For the safe working on and with On-track machinery in the vicinity or near exposed High voltage OHTE.	Lecture room training = 1,25 d On-the-job training = 0,25 d Criterion test = 0,5 d Total = **2 days** **Accredited Electrical trainer**	• Workers working on a machine (High risk area's) • Operators • Machine fitters • Area supervisors • Contract supervisors
C) COM **Competency** (Electrical) (To follow A) (PWC)	Work permits safe working procedures under the direct supervision of a responsible representative.	Lecture room training = 0,25 d On-the-job training = 0,25 d Criterion test = 0,5 days Total = **1 day** **Accredited Electrical trainer**	Supervisor (Responsible person in charge at machine working)

b) The electrical awareness training must be arranged for beforehand on-the-job.

c) The electrical educational and competency training may be arranged for at either a depot's lecture room's (Transnet Freight Rail property), or at a venue of the Contractors choice (Contractors cost).

d) The Accredited Electrical trainer from Transnet Freight Rail will be provided by Transnet Freight Rail at Transnet Freight Rail cost, provided that an arrangement for the training session required, is done beforehand and will fit in with the trainers training program for the year.TRAINING

4. STANDARDS OF WORKMANSHIP AND ACCURACY:

4.1 The A-standard given in Appendix A hereof shall apply to all measuring stations except if, prior to tamping:

4.1.1 Any one of the TOP, CANT or LINE measurements at the measuring station exceed:

- A standard outside the capability of the machine (C or B standard - to be qualified in tender) , or,
- if the measuring station is one of more than three consecutive VERSINE measurements which exceed the machines tendered ability to rectify on one side in a curve (C or B-standard), or

4.1.2 The running top is such that the depth of the worst slack is more than the required lift, or

4.1.3 The lift for a single pass or the final lift of a multiple pass is less than 10mm or exceeds 25mm, or

4.1.4 The amount of slew, due to LINE or VERSINE errors is more than the maximum slew the machine can achieve per pass, or

4.1.5 The rail temperature is above the maximum temperature in the working (B) range as determined from Appendix E to the Service Information.

4.2 The standards of workmanship and accuracy apply to the tamping and aligning of established track and the final tamp of multiple passes on all track. The Supervisor will inform the Contractor when a different standard will apply.

4.3 On transition curves the cant is to be increased proportionately along the length of the transition curve, or as otherwise directed, to the required cant of the butting circular curve.

4.4 The cant to be applied to curves will be as determined from the radius of the curve or as directed by the Supervisor.

4.5 On tangent track reference points will be installed by Transnet Freight Rail where repeatable alignment is important. These will be a maximum of 200m apart.

4.6 The running top of the track and the alignment may need adjustment where adherence to the minimum structure gauge is essential or at tie points such as platforms and level crossings. Details of adjustments which may be required will be provided by the Supervisor.

4.7 The accuracy of contact wire height measurements shall be ± 10 mm and contact wire stagger measurements shall be ± 20 mm.

4.8 Should the Contractor contest any track or site conditions (geometry, sleepers, formation, ballast, etc.), he shall record all relevant information prior to and after tamping.

Where the Supervisor concurs, the required standards of workmanship and accuracy will not be applied.

5. **EVALUATION OF MACHINE PERFORMANCE**

5.1 Machine performance will be evaluated by measurements of the track geometry behind the machine operation. Defective machine performance is indicated by measurement that fails to meet the specified geometry standard i.e. a "failed measurement".

5.2 The performance of the machine will be acceptable if the number of failed measurements does not exceed the specified number shown in Appendix C. Plain track and restricted track will for this purpose be divided into 500m sections.

If the terms of clauses 5.2 exclude a portion of track from measurements or the 500m section is not complete (e.g. if a set occurs within the section) the tolerance will be reduced proportionally.

5.3 Should any geometry measurement exceed the C-standard or if the structure gauge be violated, the fault shall immediately be rectified by the machine.

5.4 The Supervisor's deputy will decide (before completion of the next 500m section) if re-tamping shall be done in case of non-conformance to clauses 5.2 or 5.3.

In all instances where re-tamping is required, the working time will not be added to the monthly total of Tw, for the duration of such re-tamping.

5.5 Should re-tamping according to clause 5.4 not be possible because of a lack of occupation time, then fifty percent of the Tw for the portion of track under consideration, taken at schedule rates, will be subtracted from the monthly total of Tw.

5.6 The tachograph will be marked by the Supervisor's deputy to indicate :

- sections that are double tamped (Twd),
- where re-tamping was done (Tbr).

5.7 The Supervisor's deputy will do a daily check of the machine's performance in accordance with clause 3.1.2. Should any measurement deviate from the accepted standard, the machine will be non-available until the fault is corrected.

6. PLANNING

6.1 The following will be determined and recorded jointly by the Supervisor's deputy and the Contractor at a monthly site meeting, scheduled to suit both parties:

(a) The previous month's production and quantities for payment purposes.
(b) The next month's detailed program and the necessary inspections required.
(c) Material requirements e.g. ballast.
(d) Welding required.
(e) Occupations.

6.2 The weekly progress and revisions to the monthly program will be determined by the Supervisor's deputy and the Contractor's representative at the weekly site meeting. Decisions made will be recorded in a designated site book provided by the Contractor. The weekly site meeting will be held during occupation time, but must not interfere with working time (Tw).

7. RECTIFICATION

7.1 Where the C-standards are not attained before the end of an occupation (see clause 5.3), or should the Contractor damage the track or any visible equipment, the Supervisor may arrange to rectify such defects. Costs will be recovered from the Contractor, at Transnet Freight Rail's rates.

7.2 The Supervisor's deputy will check the condition of the bonds/cables at the end of each occupation, and should the condition or quality of these not be acceptable, repairs shall be carried out at the expense of the Contractor.

7.3 Transnet Freight Rail's rates will be as below, and will be subject to price adjustments described in clause 12.3 of the E.160. Labour rates will be enhanced by 33 % for Saturdays and 100 % for Sundays and Paid Public Holidays.

Artisan / Platelayer	=	R 90,00/hr	
Skilled labour	=	R 50,00/hr	
Unskilled labour	=	R 30,00/hr	
L.D.V	=	R 30,00/hr	Excluding driver
Lorry	=	R 70,00/hr	

Material prices will be determined as and when applicable, subject to a 25 % mark-up.

8. TAMPING RATE

8.1 The tendered nominal production rate in sleepers/minute must be maintained over a calendar month.

8.2 The following definitions apply in this regard:

SA = The total number of sleepers actually tamped each month.
Tw = Actual working time for tamping (minutes) per month.
R = Nominal Tamping rate as tendered in the schedule of machines and as specified according to clause 3.1.2.
Actual Tamping rate = SA/Tw > = R

8.3 If the Supervisor requires double tamping, the number of sleepers counted towards SA will be **DT** x Sd, where Sd is the number of tachograph registrations for double tamping. This will only apply to double tamping of section with more than 700 sleepers. (DT = Double tamp factor of tamp rate as tendered for machine. Tenderer to provide this rate)

8.4 If the actual monthly tamping rate is slower than R, Tw will be multiplied with the ratio:

P = Productivity Factor = (Actual Tamping Rate) / R

8.5 The tamping rate shall be maintained at R plus or minus 3 sleepers/minute at all times during tamping. The nominal tamping rate will be taken into consideration during adjudication of the tenders.

CONTRACT No. SI/PC 10001 TAMPING PLAIN TRACK. (High Speed TAMPER WITH STABILISING AND REGULATING FUNCTIONS ATTACHED)
SCHEDULE OF QUANTITIES AND PRICES

Item	DESCRIPTION	QUANTITY	UNIT	RATE	AMOUNT
1.	Establishment	1	Sum		
2.	Machine hire				-
2.1	First 240 To days per annum				-
2.1.1	Tamper	Provisional	Day		-
2.1.2	Stabilser	Provisional	Day		-
2.1.3	Tamper and Stabiliser	30	Day		
3.	Working hours Tw				-
3.1	Tamper	Provisional	hour		-
3.2	Stabilser	Provisional	hour		-
3.3	Tamper and Stabiliser	150	hour		
4.	Overtime (Both machines)				
4.1	Overtime hours outside Tom of 8 hours per day	10	hour		
4.2	Over time payment for Saturdays when in excess of 5 out of 7 or 10 out of 14 days are worked consecutively.	4	hour		
4.3	Over time payment for Sundays & PPH when in excess of 5 out of 7 or 10 out of 14 days are worked consecutively.	4	hour		
5.	Shift allowance. (Both machines)				
5.1	Shift payment for Saturdays when working 10 out of 14 days	24	hour		
5.2	Shift payment for Sundays & PPH when working 10 out of 14 days	24	hour		
5.3	Night shift payment for night shifts between 19h00 and 0500 (in addition to any other shift or overtime payments)	Provisional	hour		
6.	Work outside contract area (Both machines)				
6.1	Re-establishment	Provisional	Ea.		
6.2	Additional cost per working (To) day	Provisional	day		
7.	Idle time (Both machines)	Provisional	day		
8.	LABOUR RATES (Normal hours)				
8.1	Artisan	-	hour		
8.2	Skilled labour	-	hour		
8.3	Unskilled labour	-	hour		
	Enhancement for overtime (extra over items 8.1, 8.2 and 8.3)				
8.4	Weekdays and Saturdays	-	percent		
8.5	Sundays and PPH's	-	percent		
9.	DAY LABOUR (Provisional)(if required)(Man day = 8 hours)				
9.1	Skilled	Provisional	Man day		
9.2	Unskilled	Provisional	Man day		
9.3	Labourer	Provisional	Man day		
9.4	Truck to transport additional day labour (+/-10), hand tools and material.	Provisional	Day		
	Enhancement for overtime (Extra over for item 9.1, 9.2 & 9.3)(for hourly rate, divide man day by 8 hours)				
9.5	Weekdays & Saturdays	-	Percent		
9.6	Sundays & PPH's	-	Percent		
10.	Moving machine	800	km		
				TOTAL AMOUNT (EXCLUDING VAT)	

TRACK STANDARDS

APPENDIX C

Track Geometry Measurements				Number of permissible disallowed measurements							
				Before train Traffic		under a train					
Type	Position	Method	Frequency	500m secti-ons	Each set	500m secti-ons	Each set	A Standard	B Standard	C Standard	Unit
VERTICAL PLANE											
TOP	All track	Gelsmar	Any position	3	1	3	1	1:1000	1:250	1:180	-
CANT	All track	Gelsmar	5m intervals	10	10%	3	10%	3	12	16	mm
TWIST	Transition curves	Calculated from cant	5m intervals	5	10%	3	10%	1:500 .(10)	1:400 .(12,5)	1:288 .(17,5)	- mm
TWIST	All other track	Calculated from cant	5m intervals	5	10%	3	10%	1:1000 .(5)	1:400 .(12,5)	1:288 .(17,5)	- mm
HORIZONTAL PLANE											
VERSINE	Curves :	10m chord	5m intervals	8	10%	-	-	2,5 mm + 5% of the cor-rect/aver. versine.	2,5 mm + 20% of the cor-rect/ave. versine	2,5 mm + 30% of the cor-rect/ave. versine	mm
LINE	Tangent track : All	10m chord	any deviation	8	10%			1:2000	1:500	1:360	-
	Between beacons	70 - 250m optical baseline	1/instrument setup	0	0	-	-	1:5000	N/A.	N/A.	-
CURVE LOCATIO	Curve markers Longitudinal	Survey	4 each curve	-	-	-	-				

N	Transverse

* These standards are the difference between specified (design) and actual measurements, except for TWIST, which are absolute values.
* Sets will be measured for TOP, CANT, TWIST and LINE at the positions Indicated in Appendix B.

PART C3.7B

PARTICULAR SPECIFICATION

THE MAINTENANCE OF TRACK WITH ONE ON-TRACK DYNAMIC TRACK STABILISER

1. NATURE OF WORK

This specification covers the maintenance of track by the Contractor with a heavy duty on-track dynamic track stabiliser. This machine will work with the heavy-duty on-track ballast-tamping machine. The machine will either be coupled or only work with the tamper. The machines will work as a unit production team.

2. CONTRACT AREA

The Contract area will be the track owned or maintained by Transnet Freight Rail. The Project Manager may however require the machine to work outside the Contract area.

3. DURATION OF CONTRACT

The Contract shall commence on the date stated in the letter of acceptance of tender and the Contract period shall be 60 months. The time taken to effect delivery of the machine to the initial place of work will not be regarded as travelling time (Tt)

The Tenderer shall specify in his tender submission the earliest commencement date after the 04th May 2004. The machine will only start with the tamper.

4. OTHER SPECIFICATIONS APPLICABLE

The terms of part 1 of specification E7 (works on, over under or adjacent to railway lines including electrified lines) and section C of part 2 of specification E7 (additional specification for electrified lines) shall apply.

5. USE OF MACHINE

The Contractor shall use the machine, as directed by the Technical Officer to consolidate Track in a controlled manner while maintaining the track geometry.

6. TYPE OF MACHINE REQUIRED

6.1 Stabilising of the track shall be done with an on-track machine that:

6.1.1 has axle mountings which ensure continuous contact of all running wheels with the track.

6.1.2 stabilises the track by applying a vertical load of up to 240kN simultaneously with horizontal vibrations of frequencies variable between 28 and 33Hz.

6.1.3 has a contact assembly capable of being lowered in a controlled manner, raised and locked while travelling free. The vertical and horizontal forces applied during stabilisation shall be separately controllable to ensure an even settlement.

6.1.4 employs two stabiliser units which must able to induce both vertical and horizontal forces into the track in a continuous action.

6.1.5 can be marshalled as the last vehicle in a train, if necessary.

6.1.6 shall have a buffer at one end and as well as couplings so that it can be marshalled in a train if necessary. The coupling between the ballast tamper and the machine shall have safety chains or a similar fail-safe device. The Contractor shall state what traction force can be transmitted through the machine.

6.1.7 shall activate colour-light signals at all times whilst on the track, and move within the standard structure gauge.

6.1.8 shall be fitted with a measuring device to record work speed, vibration frequency, amplitude of vibrations, and the degree of settlement to the right and left and the cross level.(As compared to the level before stabilising). A daily graphic print of these readings is required. The measuring device shall have a warning system that is automatically activated when the track cross level is outside the pre-set limits.(In this regard, also refer to the specification for the tamper)

6.1.9 shall have sufficient lights fitted at the rear end for travelling at night, and an amber warning light on the roof.

6.1.10 shall be fitted with an automatic system that stops stabilising, and comes into effect moments after the tamping machine has stopped tamping.

6.1.11 shall be fitted with ballast regulating blades (as per Item 1.1. of the Tamping Contract)

7. MEASUREMENT AND PAYMENT

The machine shall be considered to be an integral part of the ballast tamping machine, Payment for the machine will be done as per Schedule B1 or B2, attached to the tamper specification. (i.e. when one of the machines has a breakdown, both are on breakdown time (Tb)) and payment for work performed must be included in the rates tendered under the schedule of quantities for the ballast tamper. The allowance in the Schedule for different rates for the tamper and stabiliser will only be made where the technical officer can productively utilise one machine alone. Provision must be made in the rate for the provision of the necessary fuels and oils by the contractor.

8. PERFORMANCE

8.1 The machine shall be able to cause a controlled settlement of at least 12 mm in one pass over a clean, freshly tamped ballast bed of 300 mm thickness, at a working speed of the ballast tamping machine. This settlement rate is based on a lift of 20mm by the tamper.

8.2 The machine will work under the following conditions:

The stabiliser will be utilised to work in tandem with a ballast tamper to build - up consolidated ballast beds in layers varying between 30mm and 150 mm.

It will also be utilised to stabilise completed new track with full ballast depth. In all cases a clean ballast bed will be used.

8.3 Measurements behind the stabiliser: Refer clause 5 of this specification and clause 6.1.8 of the tamper specification E160/2. The tenderer shall qualify his tender as to what method of measurement will used between and after the stabiliser so as to indicate where the following occurs:

- Where track alignment behind the stabiliser exceeds the minimum safe standard. (Indicate where the track standard exceeds the minimum required standard for safe track as specified in the project specification for tamping, E160/2)
- Where the track alignment behind the stabiliser exceeds the required standard.

Any deterioration of the track geometry caused by the stabiliser, will cause the machine to be considered unavailable until such time as it can be proved otherwise. The track shall be rectified by the Contractor to within standards specified at the Contractor's cost.

The track standards as laid down in the E160/2 for the ballast tamper shall apply.

TRANSNET

(REGISTRATION NO.1990/000900/06)
TRADING AS
TRANSNET FREIGHT RAIL

ADDENDUM NO. 1 TO THE SECONDARY SPECIFICATIONS AND GENERAL SPECIFICATIONS TO THE CONTRACT

1) Wherever the word "Spoornet" appears in the secondary specifications, please replace it with "Transnet Freight Rail".

2) Wherever it is referred to the E5(M.W.)(1996) or the E5(Nov.1996) General Conditions of Contract, please refer to the conditions of contract of the TSC3 Contract.

3) Wherever the word "Technical Officer" appears in the secondary specifications, please replace it with "Service Manager's Deputy".

4) Wherever the word "Project Manager" appears in the secondary specifications, please replace it with "Service Manager".