Part C3: Service Information

Part C 3.1

Service Information by the Employer

Maintenance of Railway Track with High Production Ballast Tamper plus Ballast Stabiliser: Countrywide for a Period of 24 Months

CONTENTS

1. DEFINITIONS

The following definitions shall apply in addition to those of the specification attached.

1.1 **Final tamped km:** Kilometre of track section final tamped and stabilised to the *Employer's* required specification.

1.2 **Single Tamp:** A tamper passes over the track and tamps every sleeper once.

1.3 **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.

1.4 **Single Pass:** A tamper passes over the track once and tamps every sleeper (single or double tamp).

1.5 **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).

1.6 **Restricted Track:** That portion of plain track where locking bars, guard rails and check rails are not removed prior to working or where sleepers are skewed by more than 75mm (measured at the rail's centre line) or where dowty retarders and boosters are fitted.

1.7 **Tamping position:** Both sides of every sleeper-to-rail fastening.

1.8 **Free- on- rail:** Free on rail implies allowing the *Contractor* to move an On Track machine from one track destination to another with no track usage cost levied on the *Contractor*. The *Employer* provides the right of passage and the pilot required, without cost and at times whereby such a passage and pilot can be made available by the *Employer.* Free-on-rail passage will normally be allowed for at the start of a contract to deliver a machine to the starting place of work and at the end of the contract to return a machine to the *Contractor*s depot if required by the *Contractor*. Free-on-Rail movement of a machine during a contract for major workshop repairs required of a machine may only occur if specifically agreed to by the *Service Manager*. Such a move shall then occur during the *Contractor*s time.

1.9 **E7/1:** Specification for General Work and Works On, Over, Under, Or Adjacent to Railway Lines and Near High Voltage Equipment

1.10 **OEM** refers to the Original Equipment Manufacturer of the Machinery

1.11 **Service Manager**. The person or juristic person appointed by the Employer from time to time as the Service Manager, to administer the contract.

1.12 **Supervisor.** Any person appointed by the Service Manager to deputise for him in supervising and carrying out the contract.

1.13 **Normal Working Hours (NWH).** A continuous shift of 8 hours out of every 24 hours for 5 consecutive days out of every 7 days or for 10 consecutive days out of every 14 days. The Supervisor will determine the starting times, which may vary to suit seasonal changes or train time tables.

1.14 **Maximum Occupation Time (TOM)** means the total occupation time granted by the *Employer* to the *Contractor* to execute the *services* as per the contract agreement.

1.15 **Working time (Tw).** The time between the actual start and end times of an occupation, excluding time on the critical path of the day's relay operations lost which may be attributed by the Employer.

1.16 **Overtime.** Means any time worked in excess of the hours of a normal working day and any time worked on Saturdays, Sundays and statutory public holidays in excess of 5 consecutive days out of 7-day period or in excess of 10 consecutive days out of 14-day period, all on the written instruction of, or as approved by the Service Manager.

1.17 **Normal Shift Working** (not exceeding Normal Working Hours): Shifts (8 hours) worked on Saturdays,

Sunday, or on Public Paid Holidays, up to Normal Working Hours.

1.18 **Night Shift Working** (Occupation time between 18h00 to 06h00): Night Shift Working will apply to any part of any shift for which occupation time has been approved and happens to fall between 18h00 and 06h00 on any day of the week inclusive of Public Paid Holidays.

1.19 **Double Shift Working**: A second shift of 8 hours within one particular 24 hour day.

1.20 **Split Occupation**: means an occupation on any one-day, divided into 2 periods, the sum of which does not exceed 9 hours, with a 2 hour break in between and the total period not exceeding 11 hours. The 2 hour break may be changed to suit circumstances, provided the *Employer* and *Contractor* agree on the period.

1.21 **Occupation:** The formal closure of the line to normal rail traffic for a specified period of time arranged in accordance with Infrastructure Occupation Management System (IOMS) or any other system and implemented in accordance with the Protection Manual.

1.22 **Total Occupation Time (To):** shall be the total of the time from when the tamping and ancillary machines arrives on site until the last machine leaves the site.

1.23 **Shutdown:** Closure of a specific line, for example the Iron Ore line once a year for limited period of time (e.g. 10 days) to perform a large volume of work. Shutdowns on various lines may be to varying degrees i.e. it may range from total shutdown perhaps requiring Double Shift Working where all normal train traffic on a line is suspended for the duration of the shutdown to a situation utilizing extended occupations with normal train operation windows in between. Some Shutdowns will be partial in the sense that while work is performed on one line and on one section of the line, normal train operations will proceed on adjacent line/s and adjacent sections of the same line.

1.24 **Train Crossing Time (Tx):** means the time for the machine to wait for train crossings.

1.25 **Travelling Time (Tt)**: means the time for the machine to travel on track between work site and the staging site (or vice-versa), or between work sites, or to clear the section.

1.26 **Movement Time (Tm):** Time allowed to move from one staging area to another when machine is required to move to new depot or area.

1.27 **Breakdown time (Tb)**: means all periods during which any machine or any part of a machine is non-available.

1.28 **Standing Time (Ts):** means the loss of Working Time (Tw) incurred by the Contractor due to reasons attributed to the Employer

1.29 **Standing Time Allowance** is the time that the Employer allows for unforeseen disruption in the Working Time. The Employer's Standing Time Allowance should be included in the tendered rates

2. DESCRIPTION OF THE WORKS

2.1 Overview

This contract includes the maintenance of track by the *Contractor* with an on-track ballast tamping machine plus a ballast stabiliser. The work shall include the provision of all on track machines required, the operation and maintenance of all equipment, the provision of all associated labour, supervision, road vehicles, ancillary tools and equipment, fuels, lubricants, spare parts and consumables and support required to achieve the output.

2.2 General Machine Requirements

2.2.1. The minimum requirements for this contract include:

- One (1) High Production Ballast Tamper; and
- One (1) Heavy-Duty On-Track Dynamic Ballast Stabiliser. The ballast stabiliser shall be capable of operating at the same linear rate as the ballast tamper, either coupled permanently to the ballast tamper, or operating independently.

2.2.2. The following type of tamping and machine capacity is required:

Machine and/or Type of Machine output required	**Planned depot or area where machine is required to work**	**Estimated Workload to be tamped per year per machine (equivalent track km)**	**Estimated Total Workload to be tamped over 24 months per machine (equivalent track km)**
High production ballast tamper (plus ballast stabiliser) capable of tamping and stabilising a minimum of 50 sleepers per minute.	All depots country wide including neighbouring countries	Approximately 1350 track km/ year per ballast tamper	Approximately 2700 track km over 24 months per ballast tamper

One hundred (100) percent of the track kilometres in item 1.1 of the BOQ is guaranteed production. The guaranteed quantities shall be allocated by the Service manager in the form of task orders as and when required.

2.2.3. The *Contractor* shall give clear details of production rates (in sleepers per minute) offered in his tender referenced to all factors e.g. track curvature, gradient, weather (raining, cold and hot), rail temperature, ballast fouling, tunnels, platform and level crossings, that might have an influence on the production rates.

2.2.4. The rate of tamping for all offers will be considered in the award of contracts. Track possession time and total time required to execute the workload shall therefore be considered for the contract award and be monitored and managed throughout the duration of contracts.

2.2.5. More work than planned may be done per depot per machine per year, only if instructed so by the *Service Manager* and confirmed as allowable within the total value of the contract by the *Service Manager*.

2.2.6. The contract includes the following:

- Corrective tamping of open line;
- Open line production tamping;
- Including continuous ballast stabilisation immediately behind the ballast tamper.

2.2.7. All machines shall be designed and able to work under the following conditions:

- All on-track machines shall fit within the vehicle gauge given in Annexure 2 of the Manual for Track Maintenance. Should any Machinery exceed the vehicle gauge in any respect, this shall be clearly indicated by the Tenderer by means of suitable drawings.
- Travel and work within the structure gauge given in Annexure 1 of the Manual for Track Maintenance, including open lines, lines in tunnels and along platforms.
- Track gauge: 1065 mm.
- The Equipment shall be limited to a maximum of 20 tonnes per axle when fully loaded.
- Single lines or multiple lines with a minimum distance between track centre lines of 3,8m.
- Move over track self-propelled on an uphill gradient of 1 in 50, or flatter
- Machines shall be capable of travelling free on level track at a minimum speed of 60km /h;
- Meet or exceed the minimum specified production rates while working self-propelled on uphill track gradient of 1 in 66, or flatter
- Moved around curves of down to 85 m radius

- Work during ballast tamping and ballast stabilising on curves of a minimum radius of 170 m.
- Work on rail sizes from 40 kg/m to 60 kg/m (inclusive)
- Work on all types of sleepers in track: steel, wood or monolithic concrete
- Sleeper spacing of 600 mm to 700 mm (inclusive).
- Work site altitude range: 0 to 2000m above sea level.
- Work within rail temperature range: -10ºC to + 60ºC.
- All machines shall have service brakes and independent emergency brakes capable of providing minimum retardation of 12.5% and gravitational acceleration of 6%.
- All machines shall activate colour-light signals at all times whilst on the track.

2.2.8. The driver's cab of all machines shall comfortably accommodate all necessary personnel and shall afford a clear unobstructed view of the track ahead for both the driver and the pilot, in both travel directions.

2.2.9. Off-tracking equipment will normally not be required for this contract. Contractors to however qualify whether machines offered are equipped with this facility.

2.2.10. The contract shall include the provision of, and management of a suitable number of basic crew of qualified operators and *Supervisors* as well as all skilled and unskilled labour to operate all machines safely in line with tendered production rates and within available occupation times.

2.3 Specific Requirements: Ballast Tamper

2.3.1. The machine shall be able to tamp plain track, restricted track, splice joints and all joint assemblies:
a). Signalling and electrical equipment such as axle counters and connecting rods will not be removed.
b). Where the machine may be required to tamp track with "dowty" plungers, the *Employer* will remove this equipment.
c). Bonds and cables will not be removed unless connections are bolted to the rail. Where bolted connections have to be removed for tamping, this shall be done by the *Contractor* where he is permitted to do so. Where removed, the *Contractor* then shall replace the connections after the tamping operation.

2.3.2. The *Contractor* shall specify and state in his submission 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 track geometry.

2.3.3. The machine shall be capable of lifting the track up to 100mm per pass and of slewing the track up to 75mm per pass.

2.3.4. 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.

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

2.3.6. The vibration frequency of the tamping tines shall be between 33 and 37 Hz.

2.3.7. The tamping assembly for one sleeper (i.e. both rails) shall consist of at least 16 tines. Individual control of the tamping assembly for each rail must be possible.

2.3.8. *Contractor*s may offer machines of a different tine configuration. Provision shall be made for the outer rows of tines to be replaced by cranked tines for tamping steel sleepers.

2.3.9. The method of tamping shall provide for an equal positive horizontal force between opposing tines. The tine closing force shall be applied hydraulically and the system shall be fitted with an adjustable pressure control.

2.3.10. 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.

2.3.11. 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.

2.3.12. Each tamping tine's tip size (frontal surface area) shall not be less than 7000 mm^2 when using 16 tines/sleeper. The *Supervisor* shall perform measurement by tracing the tine on graph paper and determining the area.

2.3.13. 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 the *Employer*.

2.3.14. The non-availability of either the design lining or lifting system will render the machine non-available. The design lifting and lining instruments shall be repositioned during Ts (Standing time caused by *Employer*).

2.3.15. The *Contractor*s shall qualify under what conditions alignment equipment cannot function accurately (eg. misty conditions).

2.3.16. The tamping rate shall be always maintained at a rate no less than the nominal tendered rate during tamping. Low service damages will be applicable when the machine's production rate is less than the nominal rate

2.4 Specific Requirements: Ballast Stabiliser

2.4.1. Stabilisers shall consolidate track in a controlled manner while maintaining the track geometry.

2.4.2. The stabiliser shall have regulating blades to regulate the shoulders of the ballast profile, and these shoulder ploughs shall be individually controllable from the operator's cabin. Sweeper rubber tines, required to clean the top surface of the sleepers (rail ties) will also be required. The transfer of ballast will not be required.

2.4.3. Signalling and electrical equipment such as axle counters and connecting rods will not be removed. "dowty" plungers will be removed by the *Employer*. Bonds and cables will not be removed unless connections are bolted to the rail. Bolted connections shall be replaced by others after the stabilising operation.

2.4.4. The *Contractor* shall specify and state in his submission the optimum stabilisation process (application of: pressure range, vibration frequency, machine speed) that will ensure long-term durability of the track geometry.

2.4.5. Under all circumstances the ballast stabiliser must be coupled to the ballast tamper for travel to and from the work site and for all machine moves.

2.4.6. The total mass of the machine shall be not less than 33 tons.

2.4.7. The machine shall have axle mountings, which ensure continuous contact of all running wheels with the track at all times.

2.4.8. The machine shall stabilise the track by applying a vertical load of up to 240 KN simultaneously with horizontal vibrations and amplitude of variable frequency between 0 and 50 Hz.

2.4.9. One stabiliser unit shall be employed, which must induce both vertical and horizontal forces into the track in a continuous action.

2.4.10. The contact assembly shall be capable of being lowered in a controlled manner and raised and locked

while travelling free. The vertical and horizontal forces applied during stabilisation shall be separately controllable to ensure an even settlement.

2.4.11. The machine 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.

2.4.12. The machine will also be utilised to stabilise completed new track with full ballast depth. For new track clean ballast will be used. Where track of which the ballast is not clean is stabilised, the *Contractor* shall qualify what optimal process of utilisation of stabilisation will be required and support the *Supervisor* in the planning of work for such a section of track.

2.5 Location of the Works

2.3.1. The contract area will be all track owned, or maintained, by TRIM country wide, in addition to neighbouring countries.

2.3.2. The *Contractor* may be required to work in areas where varying degrees and types of security situations are prevailing such as may occur in remote rural areas through to densely populated metropolitan areas. The *Service Manager* reserves the right to deploy the machine wherever it is needed within the borders of Republic of South Africa and neighbouring countries.

2.3.3. The *Employer* shall compile the schedule of work for each Machine as per the workload issued as and when demand arises.

2.3.4. The deployment of the capacity of the Tamper and the priority of work site shall be determined by the *Employer*.

2.3.5. TRIM will make available to the *Contractor* lines where the machine may be commissioned and tested. Work done during the commissioning or testing period is not eligible for payment under the Contract unless provided the standards as per Contract specification are met.

2.3.6. Security of all of the *Contractor's* property, equipment, materials, vehicles and workforce shall at all times during the course of the contract be the *Contractor's* sole responsibility.

2.6 Commencement and Duration of Contract

2.4.1. The commencement date will only be finalised after acceptance of tenders. The Contract will therefore commence on the date stipulated in the acceptance letter. The Contractor shall be able to commence with the service within 180 days of contract award.

2.4.2. Bidders shall also qualify their offers stating how soon after the award of the contract they will be able to start with the work. This shall include the provision and operation of any other on-track machines or support equipment. Where equipment offered may only be available at a later date, the date at which this will be available shall be indicated clearly upon submission of tender.

2.4.3. The duration of this contract is twenty-four (24) months. The expiry date will therefore depend on the starting date of each part. The work output required shall depend on *Site* conditions and is expected to be carried out over the full duration of the contract period of twenty-four (24) months. The Contractor shall Supply, Operate and Maintain the machine.

2.4.4. The Contract can be terminated by mutual agreement should technical or safety problems become evident during the execution of the works.

3. PROCUREMENT

3.1 Subcontracting

No part of the contract may be sub-contracted in any way without written approval from Transnet Rail Infrastructure Manager ("TRIM").

4. ENGINEERING

4.1 Testing

4.1.1. The *Employer* will test all on-track machines regularly for rail-worthiness before being permitted onto operational tracks. The *Employer's* approval in this regard shall under no circumstances mean to imply that the *Contractor* is released from his liability and/or responsibility for ensuring that all machinery is operationally safe and rail-worthy. The *Contractor* shall remain ultimately responsible for the safety and condition of his machines and equipment. These tests will include:

- Regular testing of braking efficiency. The minimum required braking is measured by Tarpley meter, for the service and emergency brakes respectively. Brake testing shall also include for checking for pressure loss on brake cylinders and circuits, wear and setting of brake shoes;
- Maximum wheel-tread and rim wear, distance between wheel-flanges and ultrasonic testing for flaws in running axles all measured for compliance with the standards of the Employer;
- Speedometer, sirens, drawbars and mechanical locks on hydraulic components to function properly.

4.1.2. Should a joint inspection of the Machinery by representatives of the Employer and the Contractor reveal that any on-track machine is not in a safe working condition, the Service Manager may order the temporary withdrawal of the machine from the service.

4.1.3. A Technical and Safety audit of the machinery and equipment must be done twice a year, and the report must be send to the *Service Manager*.

5. CONSTRUCTION

5.1 Works Specifications

The following additional specifications shall apply:

- TFR Trains Working Rules
- TFR Protection Manual
- TFR Electrical Safety Instructions
- TFR Infrastructure Safety Guidelines.
- TFR S410 Specification for Earthworks
- E10: Specification for Railway Trackwork.
- E10/1: Specification for laying of rails.
- E10/2: Laying of sleepers.
- E10/4: Ballasting and tamping.
- E10/5: Destressing of rails.
- E10/6: Building and Replacement of sets.
- E10/7: Field welding of rail joints.
- E10/9: Slewing and Alignment.
- E10/11: Surveying and setting out of track alignment and referencing.
- E10/12: Installation of insulated rail joints

- E4B (November 1996): Minimum Communal Health Requirements in areas outside the jurisdiction of Local Authority
- E4E SHE Specification for Contractors
- Addendum No 1 to Specification E7/1 (May 2011)
- Specification E7/1 (May 2011): Specification for works on, over, under or adjacent to railway lines and near high voltage
- Manual for Track Maintenance
- Track Welding Manual
- SANS 1921-1-2004 Part 1

5.2 Plant and Materials

5.2.1. The Employer shall supply and control all flags and detonators for protection of the work sites.

5.2.2. Care of material Supplied by the *Employer*: Should lost or damaged material be replaced by the *Employer*, the value of the material plus the cost of transport, including re-railing at the normal tariffs applicable to the public, will be deducted from any moneys payable to the *Contractor*.

5.3 Construction Equipment

The Contractor shall in addition to what is stipulated in this Service Information, provide the following facilities and support:

5.3.1. Lighting of the Work Site

The Contractor shall provide lighting on and with a machine should the machine be required to work at night. Where a machine is required to work at night, the Contractor will be required to provide lighting for the support labour required to work with the machine. This will apply to all workplaces in tunnels and other work places where work is to be taking place during hours between 18:00 and 06:00. The *Employer* will notify the Contractor at least one week prior to lighting arrangements needing to be made. The lighting shall be of intensity and spread to satisfy safe work and efficiency requirements.

The Contractor's lighting will not be required on the workplaces where the *Employer's* labour is employed. The Contractor may also utilise the existing lighting power supplies (where available) to assist him in lighting the workplace.

5.3.2. All tools/equipment, perway, small plant, earthworks plant, cranes, lifting equipment and vehicles of every description necessary for the execution of the works shall be supplied by the Contractor complete with fuel, spares, maintenance, competent operators and legally compliant with all applicable safety legislation. All ancillary and associated equipment together with all transport, accommodations, fuel, lubricants, spare parts for maintenance and repairs and consumables and any other resources necessary for the complete and effective and safe functioning of all Machinery shall be included in this contract to consistently and sustainable operate the machine safely in line with tendered production rates and within available occupation times.

5.4 Labour

5.4.1. The Labour, supervision and vehicle, normally required to do the work must be listed in the "Schedule of labour and plant for preparation for tamping." The labour shall be provided with the necessary hand tools such as measuring equipment, pionjars, beaters, forks, spanners, bars and levers for sleeper clip and spring fastenings. The cost of this labour listed in this schedule shall be included in the machine hire rates tendered. This labour shall be utilised fully for all work related to the items listed above.

5.4.2. Where the volume of work required, exceeds that what can reasonably be done by the labour listed in the schedule, the Service Manager 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 will be dealt with as a compensation event.

5.4.3. Additional work required by the Service Manager, may also be done by the additional labour as overtime, separate from the machine occupation time or overtime and will be dealt with as a compensation event.

5.4.4. Reasonable work volume for the additional labour will be agreed on between the Contractor and the Employer. (Man hours for each separate labour task).

5.5 Existing Services

5.5.1. The *Contractor* shall take note of all OHTE equipment, red and other electrical bonds on the work Site and shall not interfere, damage or work on them unless under direct supervision of a designated and competent TRIM Electrical Officer.

5.5.2. The *Contractor* shall take note of all signalling equipment on the work Site e.g. signals, signal cables, block joints, signal bonds, axle counters, hotbox detectors etc and shall not interfere, damage or work on them unless under direct supervision of designated and competent TRIM signal technicians.

5.5.3. 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

5.6 Site Access

5.5.1. All *Contractor's* personnel shall be inducted before any works commence. Site access certificates will only be issued after all inductions have taken place.

5.5.2. Site access will be denied to the *Contractor* should the site access certificate not be issued.

5.7 Site Establishment

5.6.1. Subject only to the discretion of the Depot Engineering Manager responsible for the area, yard lines within the railway reserve may be made available to the *Contractor* for staging the wagons making up the consist of the machine.

5.6.2. Subject only to the discretion of the *Employer's* Depot Engineering Manager, areas within the railway reserve may be made available to the *Contractor* for accommodation, offices/workshops or stores. Where not allowed, the *Contractor* shall make his own arrangements elsewhere, at the expense of the *Contractor*.

5.6.3. If the *Contractor* is allowed by the *Employer's* Depot Engineering Manager to utilize areas within railway reserve for his purposes of whatever nature, it shall be noted that normally electrical, water supply and sanitation will not be available. The *Contractor* shall be required to make his own provisions for electrical, water supply and sanitation. Additionally, the *Contractor* shall comply with Environmental Health and Safety legislation when utilizing areas within railway reserve. On vacating the site, the site shall be cleared up and re-instated to the acceptance of the Employer's Depot Engineering Manager.

5.6.4. Security of the *Contractor's* property, equipment, materials, vehicles and workforce shall at all times during the course of the contract be his sole responsibility. No claims will be entertained by TRIM in this regard.

5.6.5. The *Contractor* shall be required for each work Site to have available for his work force suitable sanitation in accordance with the Act 85 Regulations.

5.6.6. On some lines or for some yards of *TRIM* , the *Contractor*'s staff will be required to obtain security permits from *TRIM* before being allowed to work there. These permits will be issued free of charge.

5.6.7. The *Contractor* shall note that not all the sites will be accessible via a service road in some instances. The *Contractor* shall have a plan to make the sites accessible to him/her in order to do the work at his own cost.

6. MANAGEMENT

6.1. Management Meetings

6.1.1. Project management meeting must be conducted once every month for the duration of the contract by the *Service Manager* and *Contractor* who must attend these meetings. Project progress and program (revision) must be discussed in these meeting. This meeting shall be for the purpose of discussing machinery moves, actual progress versus construction program, delays, service information, etc.

6.1.2. Operations planning meetings must be done every scheduled day and on Site. The *Contractor, Employer* representative (typically the foreman) and all other supporting staff of both *Contractor* and *Employer* must be part of these meetings. Safety, risk and environmental matters need to be addressed in these meeting. All these will do prior the operation for that particular scheduled day.

6.1.3. Payment meeting must be conducted once every month for the duration of the Contract. Both the *Service Manager* and the *Contractor* must be represented in these meeting. This activity must be done before the 10th of every month, payment submission and assessment must be done according to NEC3 Terms Service Contract (TSC3).

6.1.4. Site meetings: The *Contractor* shall attend meetings as scheduled by the *Service Manager and* such meetings shall be for the purpose of discussing daily challenges experienced with the machine and operational issues.

6.1.5. The *Service Manager* may call ad-hoc meetings any time during the contract period.

6.2. Planning

6.2.1. The following will be determined and recorded jointly by the *Service Manager* and the *Contractor* at a monthly site meeting, scheduled to suit both parties:

- The previous month's production and quantities for payment purposes.
- The next month's detailed program and the necessary inspections required.
- Occupations.

6.2.2. The weekly progress and revisions to the monthly program will be determined by the *Service Manager* and the *Contractor*'s representative at a 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).

6.2.3. 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 Service Manager. Curve beacons, indicating beginning and end of circular and transition curves, shall be replaced and fixed by the Employer according to the latest design.

6.2.4. 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 what is required to ensure a proper tamping job. The Service Manager shall inform the Contractor one month prior of what work shall be required and what material will be provided. This work may include the repair of off-track platforms and the boxing in of ballast, all within the capacity of the labour listed in the "Schedule of labour and plant for preparation for tamping.".

6.3. Site Records

6.3.1. A *Site* Instruction Book with triplicate pages shall be provided by the *Contractor*. The format for written communication on *Site* shall be the *Site* Instruction Book. A new page shall be used for each *Site* Instruction. *Site* Instructions shall be deemed to have been noted by the other party at the end of each work day. For this purpose the *Site* Instruction Book shall be checked and new *Site* Instructions signed-off by both *TRIM* and the *Contractor* at the end of each work day.

6.3.2. A Site Diary with triplicate pages shall be provided by the *Contractor* and be available on site at all times. The number of staff and plant on site for every day shall be recorded. The hours of actual work and the accurate amount of work measured per item as in the Schedule of Quantities completed for each day shall also be recorded and signed off by both by the *Employer* and the *Contractor* at the end of each day. The *Contractor* shall record following in the *Site* dairy:

- Occupation and Working time
- Details of performance of the machines as well as the number of sleepers tamped per day per track category.
- An accurate recording of all material received or purchased.
- Details of plant, machinery and labour on Site, clearly indicating the staff used to perform various different functions.
- Minutes of the Site meetings.
- The Site diary shall be signed on a daily basis by both parties.
- Information shall be reported as per the daily report, emailed electronically including train crossing numbers and minutes delayed, the following day before 08h30.

6.3.3. The information in the Site Diary shall be identical to the report generated by the machine. The Employer shall provide a template and it shall be the source document for monthly payment certificates.

6.3.4. The daily report e.g. travel to site, work time, and travel return to staging sites times as well as production figures shall always be recorded and submitted to the *Supervisor* and *Service Manager* daily every morning for the previous day's occupation by email at 08:00.

6.3.5. A TRIM Track Inspector shall on completion of each project inspect and measure for purposes of verifying quality for payment purposes. A formal handing over of the completed project shall be signed off by the Depot *Supervisor*, for the project to be eligible for payment.

6.4. Contractor's Documentation

The Contractor shall maintain the following documentation on a regular basis:

6.4.1. A complete maintenance manual and spare parts list must be available on the machine.

6.4.2. The Contractor shall supply the Service Manager with maintenance plans and submit monthly maintenance reports.

6.4.3. A complete operator's instruction manual must be available on the machine.

6.4.4. A complete machine safety and risk file must be available on the machine.

6.4.5. A visitor registration book must be available on the machine.

6.5. Occupations

6.5.1. Although not guaranteed, the *Employer* will realistically arrange occupations according to the approved programme of typically 8 hours for any one occupation.

6.5.2. Travel time from the staging site to the work site and back to staging site will be included in the Occupation Time (To).

6.5.3. During the occupation the line will be closed to normal rail traffic over the section on which the *Contractor* is working. Protection of the site shall be as per the protection manual under direct control and supervision of the *Employer* Platelayer/Track Inspector.

6.5.4. The *Contractor* shall control and be responsible for the movements of all plant including that of the *Employer*, within the confines of the area of the occupation. At all times, the movement of plant will be undertaken as laid down by the *Supervisor*.

6.5.5. The *Contractor* shall however allow that:

- Before midday during any shift the commencement time and duration of the following occupation will be advised in writing.
- Occupations may commence at any hour of the day or night and on any day of the week. The Employer requires that all the on-track machines may work double shifts and therefore the Contractor is expected to price his tender based on similar requirement. The double shift will be paid against the tendered items.

6.5.6. Any adjacent track will run normal train services at normal section speed. The Contractor will be required to apply his Safety Procedure in order to safeguard his employees against the danger of normal rail traffic passing close by on the adjacent line.

6.5.7. Occupations shall be called for on any day of the week or month of the year.

6.5.8. The Contract shall allow in his tender for the normal builder's break from middle December to 2nd week in January every year with the specific provision that in the case of an emergency the process may be called from leave during the builder's break to do work.

TRIM shall notify the *Contractor*, 1 month prior to *Contractor*'s Annual Holidays, of the requirement of standby staff for emergency work during *Contractor*s Annual Holidays.

When required, the *Contractor* shall supply standby staff (fitter, operator and plant assistant) for emergency work.

The *Contractor* shall supply 2 contact phone numbers for emergency call out purposes (the standby staff shall be available 24 hours a day, 7 days a week)

The call out reaction time shall not exceed 24 hours from time of the call out to the time the machine is at staging point. Consideration must be given in respect of the standby staff getting sufficient rest before commencing work.

The *Contractor* shall make the necessary arrangements for accommodation and food of standby staff and all costs shall be included in the rates tendered.

6.5.9. 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 of *TRIM Track Master/ Track Inspector.* The function of the *TRIM Track Master/ Track Inspector* is restricted to competent *TRIM* employees only

6.5.10. The *TRIM Track Master/ Track Inspector* shall be a competent *TRIM* employee, reporting to the *TRIM* (Depot Engineering Manager. This *TRIM Track Master/ Track Inspector* 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

6.5.11. The *Contractor* shall provide and maintain his own communication systems, including walkie-talkie radio transceivers, cell phone communication, plus public announcement system. These systems shall comply with any South African legislation as well as the *Employer* rules for walkie-talkie radio communication. All systems shall be approved by the *Employer*.

6.5.12. The *Contractor* shall provide a cell phone to the worksite for the exclusive use of TRIM for logistical and operational arrangements.

6.6. Protection

6.6.1. The method of work shall be such that work may proceed either under "total occupation" or "between trains occupation" and shall at all times comply with *TRIM* Specification E7/1

6.6.2. Normal protection measures in accordance with the *Transnet Freight Rail* (*TFR*) Train Working Rules shall apply

6.6.3. All protection arrangements shall at all times remain under the supervision and responsibility of a *TRIM* Track Master/ Track Inspector.

6.6.4. The *Contractor* shall supply at least two flagmen per work *Site* for protection duties. The cost for these flagmen will be deemed included in the rates tendered and no separate payment shall be made.

6.6.5. The *Contractor* will be required to supply six of his employees to be trained and certificated in performance of protection duties. The *Contractor* shall appoint at each work *Site* a person whose sole task shall be to be on the lookout for approaching rail traffic. This employee shall operate an audible warning device to timeously warn all people on the work *Site* of approaching rail traffic.

6.6.6. The *Contractor* shall not allow any persons on the work *Site* to venture within the structure gauge when this warning procedure is not operating effectively.

6.6.7. The warning device shall be such that its sound can be clearly and effectively heard above the noise on the work *Site* by all personnel within a radius of 100m around the centre of each work *Site*. The cost to the *Contractor* of providing the lookout as well as the warning device shall be deemed to be included in the rates tendered and no separate payment shall be made.

6.6.8. An effective safety procedure to be followed by all personnel on any work *Site* in the case of approaching rail traffic on adjacent lines shall be compiled by the *Contractor* and implemented before any work commences. This procedure shall be updated whenever the need arises and any changes shall be communicated to all employees on a *works Site* before work proceeds.

6.6.9. *TRIM* shall make available a Track Master to oversee the protection arrangements on *Site* and to declare the track safe for the passage of trains during the work and on completion of work. He may use flagmen provided either by *TRIM* or the *Contractor*.

6.7. Traction and Signal Bonds

6.7.1. The *Contractor* shall repair all bonds / cables removed or damaged or broken off during tamping or ballast regulating operations during the period of the occupation.

6.7.2. The *Employer* 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.)

6.7.3. The *Contractor* shall provide labour and equipment (inclusive of expanded collar fastening consumables and lugs) required to remove, repair new bonds where required and replace signals and electrical bonds.

6.7.4. If holes are required for bonds on tamping contracts, a rail drill shall either be supplied by the *Employer* or the holes shall be drilled by *Employer*.

6.7.5. Where cables are required to be cut, the cut cable shall be cut to the correct lengths and be the crimping of lugs onto cables be done by the *Contractor*. No splices will be allowed in bonding cables.

6.7.6. This shall include track feeder bonds (painted red), which may only be worked upon under supervision of a Competent Electrical Officer. The *Employer* shall only provide the cable for bonding. All bonding shall be completed during the period of the occupation.

6.7.7. Bonding shall be performed by a bonder qualified to the Employer's standard manual for "Earthing and Bonding for 3kV DC, 25kV and 50kV AC bonding" B_023 Issue 3 and B_028 Issue and subsequent instructions which includes the steel wire standard in lieu of existing copper bonds, and the expanded collar fastening system. The cables shall be correctly buried in the ballast as per instruction.

6.7.8. Signalling bonds may not be removed without the consent of the *Employer* or the authorised *Employer's* Signalling representative. Where signalling bonds are damaged or removed, the *Contractor* shall provide the support labour to re instate the bonds. The *Employer* will however be responsible to ensure the correct method of re-connection so as to ensure the correct functioning of the signalling system.

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

6.8. Level Crossings

6.8.1. The *Contractor* shall open up level crossings in front of the machine and restore it after tamping and stabilising.

6.8.2. Repair of level crossings may include replacement of damaged sleepers and fastenings.

6.8.3. Where required, the *Employer* will arrange, beforehand, with the road authority, for permission for the opening up of paved level crossings and for the final repair of the damaged paved part thereof.

6.8.4. The *Contractor* will be required to repair paved level crossings by an approved method, using an approved type of bagged pre-mix bitumen. The method and material will be subject to the approval of the *Supervisor*. The repair shall provide sufficient compaction of the damaged area and allow for an evenly adjusted alignment of the road surface to ensure safe passage of road traffic. Where required, the final alignment and repair of the road surface may be arranged by *Employer* to be done by the road authority.

6.8.5. Material required for the level crossing repair will either be provided by the *Employer* or may be provided by the *Contractor*. Where material is to be provided by the *Contractor*, such as bagged bitumen pre-mix, payment for such material shall be made under the item included in the schedule of quantities with the provisional lump sum.

6.8.6. An inspection before work and thereafter shall be done of the level crossing including the cattle guards. A list of material needed shall be handed to the *Service Manager*. Each level crossing including the cattle guards shall be signed off by the *Employer.*

6.8.7. The *Contractor* shall take appropriate control measures for the period when a level crossing is opened and provide sufficient traffic warning signage.

6.9. Track Lubricators

The Contractor shall remove all track lubricators ("greasepots") in front of the machine and replace these after tamping. The Employer will be responsible for adjustment of the lubricators after replaced by the Contractor.

6.10. Stoppages

6.10.1. Temporary stoppage, which may result from a non-continuous flow of the work, as and when required and shall be allowed for in the tendered rate.

6.10.2. TRIM will advise the *Contractor* of any temporary stoppage in the work, 30 days' notice will be given of such an impending stoppage. Thirty days (30 days) notice will also be given to commence work when the Machinery was standing due to a temporary stoppage.

6.10.3. No Payment for De-establishing from *Site* when temporary stoppage begin as well as Re-establishment on commencing of the work after a temporary stoppage will be made.

6.10.4. The *Contractor* shall allow that weather conditions may adversely affect his rate of progress and plan his progress as well as plant and labour capacity accordingly.

6.10.5. Should rain or snow falling during the period of occupation, make it impossible for the *Contractor* to make use of such occupation no claims for Standing Time will be entertained by *TRIM*.

6.10.6. The *Contractor* shall not claim any Standing Time against *Employer* for any force majeure and no penalties shall be imposed by the *Employer* to the *Contractor* for the same

6.11. Recording of Activity Times

6.11.1. The mutually agreed time the machine shall be available at its staging point, shall be the start of the occupation time (To) for the task order, therefore arriving late shall be deemed as breakdown time (Tb).

6.11.2. During the work activity the productivity, availability and utilization of the machine shall be recorded.

6.11.3. The time shall continuously be recorded for all work performed. The following types of time activity shall continuously be recorded so as to clearly define what time is available for working.

To = Total Occupation time for the day.
Ts = Standing time because of *Employer* reasons, not related to any fault of the *Contractor*.
Tx = Standing time due to Train crossing time
Tt = Travel time from staging site to work site and back to staging site or to clear the section.
Tm = Time allowed to move from one staging area to another when machine is required to move to new depot or area.
Tp = Time required to for preparation of track to allow working. (Only preparation that is purely related to machine on site that could not be phased apart from machine can be recorded for this purpose. This item may not be used for any problem related to the machine or staff inefficiency)
Tb = Breakdown of machine

Daily production report must be e-mailed to the *Service Manager* at 08:00 am in the morning of the next day after each shift, and must be in excel format.

Tw = Working time (As specified below)

Where: (Totals for the month)

$T_w = T_{wps} + T_{wpns} + T_{wr}$
T_{wp} = Time spent on tamping plain track (Standard 700mm spacing).
T_{wpns} = Time spent on tamping plain track (Spacing different).
T_{wr} = Time spent on tamping restricted track

S_{aps} = Actual number of plain track sleepers tamped (700mm spacing)
S_{apns} = Actual number of plain track sleepers tamped. (Spacing different)

A productivity factor, P shall be calculated every month to continuously monitor whether the machine consistently produces at the rates of production tendered.

Monitoring of machine availability will be calculated as: Availability (A) = $\frac{To - Tb}{To}$

Monitoring of machine utilization will be calculated as: Utilization (U) = $\frac{Tw}{To}$

Monitoring of machine productivity will be calculated as: Productivity (P) = $\frac{AR}{TR}$

AR = Actual Rate (Sleepers/minute)
TR = Tendered Rate (Sleepers/minute)

6.11.4. The tendered nominal production rate in sleepers per minute shall be maintained over a calendar month for both the ballast tamper and ballast stabiliser.

6.11.5. All Tb shall be recorded at all times. Where a machine becomes unreliable and continues breaking down and results in train delays or occupations having been taken with insufficient production, the *Service Manager* may decide on placing a machine on breakdown until such time that the *Contractor* can prove that the machine can be consistently available. The machine will always be required to produce the required standard of work required at full production rate.

6.11.6. The ballast tamper shall at all times operate with the ballast stabiliser. The ballast stabiliser should not cause delays to the ballast tamping machine. If for any reason the ballast stabiliser is not available due to Tb being booked on the ballast stabiliser, or the ballast stabiliser delays tamping, the ballast tamper will be stopped. The delay will therefore be measured as Tb of the ballast tamper and as Tb of the ballast stabiliser. The *Contractor* shall be advised immediately when the ballast tamper has been stopped due to the performance of the ballast stabiliser.

6.11.7. Double tamping may be required as instructed by the Supervisor, for instance (and not limited to) when the ballast is extremely fouled and /or a lift exceeding 40mm is required:
- If the Service Manager requires double tamping over sections longer than 700 sleepers, the number of sleepers counted towards Sa will be 0.75 x Sd, where Sd is the number of tachograph registrations.
- If the Service Manager requires double tamping over sections shorter than 700 sleepers, the number of sleepers counted towards Sa will be equal to Sd, where Sd is the number of tachograph registrations.

6.12. Provision of Electronic Production Report to the Employer.

6.12.1. The *Contractor* shall provide the *Employer* with the daily production statistics of the work.

6.12.2. The production report shall be in an agreed on format providing the following basic type of information:

a) To, Tw, Tt, Ts, Tb, etc. of each machine applicable.
b) Length of work or number of sets completed for the day.
c) Start & final km tamped and GPS coordinates with the length and description of the rail line.
d) Reasons / comments on production shortfall including minutes per reason.
e) Train numbers and minutes delays per train number.
f) CTC names and CTC panel member details.
g) Graphical presentation of data as and where agreed on.

6.12.3. The report shall be e-mailed daily to the *Service Manager, Supervisor* and nominated *Employer's* representatives.

6.12.4. Where problems exist of actually transmitting the data, the *Contractor* shall state what measures shall be taken to ensure transmission of data as soon as possible.

6.12.5. All data shall be summarised per week and then per month. Data may be used as a preliminary indication of payment but shall not be used specifically for payment purposes. Final payment data shall be dealt with as specified elsewhere.

6.13. Quality

6.13.1. Standards for acceptance of track shall be in accordance with the Manual for Track Maintenance.

6.13.2. Geometry measurements done by the *Contractor* ahead of and behind the tamper and stabiliser in accordance with Appendix C, shall be handed in hard copy to the *Employer's* representative on the same day that the work has been performed. Labour for these measurements must be included as part of the compulsory support of the machine and not extra labour.

6.13.3. Measurements shall be done manually and/or electronically before the passage of the first train.

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

6.14. Standards of Workmanship and Accuracy

6.14.1. The A-standard given in the Manual for Track Maintenance and summarised in Appendix A hereof shall apply at all measuring stations, except if, prior to tamping:

Any one of the TOP, CANT or LINE measurements at the measuring station exceed the C standard, or if the measuring station is one of more than three consecutive VERSINE measurements which exceed the B-standard to one side in a curve, or

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

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

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

The rail temperature is above the maximum temperature in the working (B) range as determined from Annexure 16 of the Manual for Track Maintenance.

6.14.2. 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 *Service Manager* will inform the *Contractor* when a different standard shall apply.

6.14.3. 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.

6.14.4. The cant to be applied to curves will be as determined from the radius of the curve or as directed by the *Service Manager*.

6.14.5. On tangent track, reference points will be installed by *Employer* where repeatable alignment is important. These will be a maximum of 200m apart.

6.14.6. 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 *Service Manager*.

6.15. Evaluation of Machine Performance

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

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

6.15.3. Should the structure gauge be violated, the fault shall immediately be rectified by the machine.

6.15.4. Should any geometry measurement exceed the B-standard, the fault shall immediately be rectified by the machine.

6.15.5. The *Service Manager* will decide (before completion of the next 500m section) if re-tamping shall be done in case of non-conformance. In all instances where re-tamping is required, the working time will be recorded as part of the total work time allocated to the *Contractor* to execute the work load.

6.15.6. Should re-tamping not be possible because of a lack of occupation time, and it is acceptable for the Track Master or Track Inspector to leave the line as it is as being safe for the running of trains, the track km tamped for payment shall be 50% of the length of track actually tamped.

6.15.7. The Track inspector however retains the right to have the section of track re-tamped to standard whereby the total time used will be recorded as time allowed for tamping but only the final length of track correctly tamped be accepted for payment.

6.15.8. The tachograph or event recorder will be marked and/or set and certified by the *Service Manager* to indicate:

- Sections that are double tamped (Twd),
- Where re-tamping was done (Tbr),
- Other tamping functions.

6.15.9. The Service Manager will do a daily check of the machine's performance

6.15.10. Should any measurement deviate from the accepted standard, the machine will be non-available and booked on Tb until the fault is corrected.

6.16. Measurement of Contact Wire Height and Stagger

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

6.16.2. The stagger of the contact wire, (offset from the perpendicular on the track centre line) shall be measured 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 innermost wire shall be measured. When sets of points are tamped, the stagger on both the through and the turnout contact wire shall be checked.

6.16.3. Contact wire height and stagger measurements shall be reported to the *Supervisor* in writing (or computer printout) at the end of each shift.

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

6.16.5. Measurements exceeding the allowable limits quoted in the E7/1 specification shall be immediately reported to the *Employer* for rectification or adjustment by the *Employer's* electrical staff. Each measurement shall indicate the mast location number as well as the relevant track section number.

6.16.6. The *Contractor* will not be allowed to use a contact system for the measurement of the electrical overhead wire height and stagger. All contact wire height and stagger measurements are to be measured electronically. The measuring equipment must be calibrated with a validation period of 12 months unless found to be inaccurate. Failure of this measurement equipment will render the Tamping machine unavailable and therefore on breakdown.

7. HEALTH AND SAFETY The *Contractor* shall comply with all applicable legislation as well as Transnet Safety requirements. The cost for such compliance shall be borne by the *Contractor* and shall be deemed to have been allowed for in the rates and prices of the Contract. Specifically important in this regard is compliance with**:**

- TFR Safety Guidelines for Infrastructure (Latest Edition).
- The Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993).
- The Occupational Health and Safety Act (Act 85 of 1993).
- TFR Specification E.4E, SHE Specification for Contractors
- Basic Conditions of Employment Act as well as all other relevant labour legislation.
- TFR Specification for Work on, under or adjacent to Railway Lines and near high Voltage Equipment – E7/1.

7.2. The Contractor shall also comply with all other safety requirements, regulations and guidelines of Transnet applicable to the nature of work carried out under the Contract and shall obtain the particulars thereof from the Service Manager.

7.3. A formal risk assessment on the machine process has been conducted by *TRIM* and the under mentioned safety critical risks have been identified. The *Contractor* shall conduct his own formal risk assessment on the machine offered by him and add any additional risks identified by him, to this list.

7.4. The *Contractor* is required to prepare and submit with his tender a comprehensive safety case in accordance with the requirements of Act 85 and the Construction Regulations.

7.5. The *Contractor* shall specify in his safety case the list of all risks identified by *TRIM* together with any

additional risks identified by his own risk assessment and indicated specific rules, processes, methods and designs of how he intends to mitigate these risks should he be awarded the contract.

7.6. Safety Critical Risks identified by *TRIM* for the contract are:

- Occupation - double line occupation
- Executing work on one line while a normal train service is running on adjacent line/s
- Excessive Working hours
- Working at night
- Emergency procedure – to stop process due to wagon or equipment failure
- Material handling and working near or under live OHTE equipment: 50kV, 25 kV and 3.3kV
- Staging in yards in proximity of live OHTE and lines on which rail traffic runs continuously.
- Danger area
- Competent operators
- Train driver/operator/ interaction/competency
- Site conditions
- Infrastructure equipment damage
- Machine working on sharp curves and steep gradients
- Machine working on embankments and in cuttings
- Machine working on fouled ballast
- Clearances
- Maximum and minimum temperatures
- Precipitation
- Integrity, i.e. Rolling stock structure, drawgear, brakes, wheels; and machine structural integrity
- Unauthorised access
- Use of various petrol and electrically driven small plant within team context i.e. disk cutters, MP12 and MC2 rail grinders, rail drills, hand held tampers, generators and associated electric equipment, joggle plates and joggle clamps etc.
- Environmental pollution/damage

7.7. Safety Compliance

7.7.1 The *Contractor* shall prepare and implement a comprehensive health and safety plan covering all relevant legal safety aspects for their work teams. It shall include details of the *Site* management structures, all safety legal appointments as well as the written safe working procedures for all equipment used on *Site* taking into account the above risk assessments.

7.7.2 The *Contractor* shall be responsible to ensure the use of only technically competent trained staff on all types of work.

7.7.3 The Health and Safety plan together with all supporting documentation shall at all times be available in a health and safety file on site for compliance audit.

7.7.4 The *Contractor* shall ensure that all *Site* staff are trained and inducted in the written safe working procedures for all equipment used on *Site*.

7.7.5 The *Contractor* shall ensure that all workers are appropriately equipped and wearing Personal Protective Equipment (PPE) and that Safety Talks are conducted and noted in the *Site* Diary before the start of every shift.

7.7.6 The *Contractor* shall be responsible to ensure that *Site* staff is always competently trained with regards to Electrical Awareness Training and such training material should be acknowledged and approved by the Employer's School of Rail.

7.7.7 The *Contractor* shall be responsible to ensure that workers working on machines (high risk areas),

operators, machine fitters, area supervisors and contract supervisor's *Site* staff are always competently trained with regards to PWC Electrical Educational Training.

7.7.8 The *Contractor* shall also be responsible to ensure that contract managers in charge of *Site*s are always competently trained with regards to COM Competency Electrical Training (to follow onto PWC Training).

7.7.9 Non-compliance with safety requirements will result in an immediate suspension of work without payment.

7.7.10 Non-compliance with environmental requirements such as oil spillages, waste, will result in penalties being levied against the *Contractor*. The *Employer* will appoint a private company to make the situation good and claim compensation from the *Contractor.*

8. TRAINING

8.1. 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. The *Contractor* shall be liable for all costs for the training of their staff.

8.2. It is the *Contractor*'s responsibility to ensure that his staff is trained. At the commencement of the contract, *TRIM* 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.

8.3. Where training is required by the *Contractor* and *TRIM* 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 *TRIM* Perway Production manager, through the *Supervisor*, for this training / testing.

8.4. Training of Track Workers

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

- Track work (Level crossing blocks, cattle guards, sleeper & clip replacement / fastening, lubricators, flagmen, ballast boxing etc.).
- Quality measurements as required for track work.

8.5. Training of Track Inspectors, Track Masters and or Trade hands (Perway)

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

8.6. Training of Flagmen

8.6.1. The appropriate training for the flagmen provided by the *Contractor* can be provided by *TRIM* at the start of the contract.

8.6.2. Where *TRIM* 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.

8.6.3. *Flagmen* shall be officially trained, evaluated and certified competent, (*TRIM* 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.

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

8.6.5. The *TRIM* Depot Engineering Manager 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.

8.6.6. The Depot Engineering Manager 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.

8.7. Training of Bonders

8.7.1. 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.

8.7.2. The initial training of bonders for this contract can be arranged for with the Employer's accredited electrical trainer, through the Supervisor as specified above in this clause.

8.7.3. Bonders shall be required to be trained for Electrical Permanent Way Competency and be trained to do WHAM bonding and bonding according to electrical specifications, instructions and drawings manual CEE 0059.84 and CEE0060.84, where applicable.

8.7.4. Follow up training of bonders shall be responsibility of the Contractor.

8.8. Electrical Awareness, Educational and Competency Training

8.8.1. The electrical awareness training shall be arranged for before any work commences.

8.8.2. The electrical educational and competency training may be arranged for at either a depot's lecture room (*TRIM* property), or at a venue of the *Contractor*s choice (*Contractor*'s cost).

8.8.3. The Accredited Electrical trainer from *TRIM* will be provided by *TRIM* at *Contractors* cost, an arrangement for the training session required, is done beforehand and will fit in with the trainers training program for the year.

8.9. The following training shall be arranged for the following Contractors staff:

Type of Training	**Staff required to undergo training**	**Estimated duration of training**	**Location of training**	**Trainer to conduct training at start of contract**	**Alternative trainer to conduct training at contract start**	**Future Refreshment training**
Induction	All contract staff including new entrants. Start of work at any new depot	+/- 2 hours	Depot where work starts	*Employer's Service Manager* or Track inspector	New recruits: *Contractor*s accredited representative	*Contractor*s accredited representative.
Electrical awareness	All contract staff including new entrants	+/- 2 hours	Depot where work starts	*Employer's* Depot's electrical officer or accredited trainer	New recruits: *Contractor*s accredited representative	*Contractor*s accredited representative.
PWC (Electrical)	*Service Manager*s, Operators, fitters, Technicians & Workers supporting fitters, working in risky OHTE areas.	2 days	Depot where work starts	*Employer's*, Esselen Park or Depot accredited trainer, or *Employer's* hired accredited trainer : By appointment at depot*	Replacement/ new staff: *Contractor*s accredited representative	*Contractor*s accredited representative.
Competency (Electrical)	*Service Manager*s (Follow up training in PWC)	1 day	Depot where work starts	*Employer's* accredited trainer, or *Employer's* hired accredited trainer : By appointment at depot*	Replacement/new staff: *Contractor*s accredited representative	*Contractor*s accredited representative.
Flagmen Training	Flagmen and standby flagmen	5 days		*Employer's* accredited trainer, or *Employer's* hired accredited trainer : By appointment at depot	Replacement/new staff: *Contractor*s accredited representative	*Contractor*s accredited representative.
Bonder Training	Bonder	5 days		*Employer's* accredited trainer, or *Employer's* hired accredited trainer : by appointment at depot*	Replacement/new staff: *Contractor*s accredited representative	*Contractor*s accredited representative.

8.10. The crew time, transport and accommodation cost related to training will be for the Contractor's account. The crew members proposed to for this training shall as minimum requirement be literate in terms of reading, writing and speaking of Basic English.

TRACK STANDARDS

APPENDIX A

Track Geometry Measurements

Number of permissible disallowed measurements

Type	Position	Method	Frequency	Before train traffic: 500m sections	Before train traffic: Each set	Under a train: 500m sections	Under a train: Each set	A Standard	B Standard	C Standard	Unit
VERTICAL PLANE											
TOP	All track	Geismar	Any position	3	1	3	1	1:1000	1:250	1:180	-
CANT	All track	Geismar	5m intervals	10	10%	3	10%	3	12	16	mm
TWIST	Transition curves	Calculated from cant	5m intervals	5	10%	3	10%	1:500 (" 5.5)	1:400 (" 6.86)	1:288 (" 9.50)	- mm
TWIST	All other track	Calculated from cant	5m intervals	5	10%	3	10%	1:1000 (" 2.75)	1:400 (" 6.86)	1:288 (" 9.50)	- mm
HORIZONTAL PLANE											
VERSINE	Curves :	10m chord	5m intervals	8	10%	-	-	2,5 mm + 5% of the correct/ave. versine.	2,5 mm + 20% of the correct/ave. versine	2,5 mm + 30% of the correct/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 set up	0	0	-	-	1:5000	n.a.	n.a.	-
CURVE LOCATION	Curve markers Longitudinal Transverse	Survey	4 each curve	-	-	-	-				

* 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.