TRANSNET RAIL INFRASTRUCTURE MANAGER CONTRACTOR HEALTH AND SAFETY COMPLIANCE SPECIFICATION

CONTRACT NAME:	Maintenance of Railway track with On-Track Ballast Low Production Screening Machines	
CONTRACT NUMBER:		
CONTRACT SCOPE:	To supply, operate and maintain the mechanised on-track process of ballast screening machine. 2 x Normal Production Ballast Screener: Each ballast screening machine shall consist of fan wagon and dust suppression mechanism plus a Ballast Regulator, Heavy Ballast Tamper, Ballast Stabiliser, 5 self-discharging spoil wagons and a TLB including all associated labour, supervision, road vehicles, ancillary tools and equipment, fuels, lubricants, spare parts and consumables. The process shall be able to work at any time of the day and night with no restrictions (wet conditions, hard ballast, etc.).	
CONTRACT LOCATION:	22 Depots of Transnet Rail Infrastructure Manager, nationwide RNC and Prasa Projects Transnet reserves the right to deploy ballast screening services wherever needed outside the boarders of the Republic of South Africa.	
CONTRACT DURATION:	24 Months	
CONTRACT MANAGER:	Khangwelo Nemushungwa	
TRIM CONTRACT REPRESENTATIVE / TECHNICAL OFFICER:	Lungani Mpungose	
CHS AGENT:	Kedibone Moselane	
SHE SPECIFICATION APPROVAL		
	NAME:	**SIGNATURE:**
TRIM CONTRACT MANAGER / CONTRACT REPRESENTATIVE	Khangwelo Nemushungwa	…… **DATE:**
RISK SPECIALIST /MANAGER	Elekanyani Phundulu	…… **DATE:**
CHS AGENT / SAFETY SPECIALIST / MANAGER	Kedibone Moselane	…… **DATE:**

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Contractor Health and Safety Specification

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1. Purpose

This specification identifies and encompass the working behaviours and safe work practices that are expected of all Transnet SOC Ltd employees, Contractors, Consultant, Visitors and Suppliers, engaged on Transnet managed contracts as required by Occupational Health and Safety Act 85 of 1993, Construction Regulation of 2014, Railway Safety Act 30 of 2024 (including applicable SANS standards) and Transnet Contractor Management Procedure.

The contractors and service providers for the maintenance of railway track with on-track ballast low production screening machines shall take careful note of these requirements and shall ensure that adequate provision has been made to ensure compliance. This Specification has been compiled to cover a wide range of construction/ work activities. In order to determine which requirements are applicable, the contractor shall conduct a health and safety risk assessment specific to the project and specific to the contractor's scope of work. All applicable requirements shall be addressed in the Contractor's Health and Safety Management Plan.

This Specification will be reviewed and updated periodically as and when necessary to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

The specification provides the minimum site-specific specification requirements.

2. Scope

This Specification applies to low production ballast screening machine at 22 Depots of Transnet Rail Infrastructure Manager, nationwide RNC and Prasa Projects. Transnet reserves the right to deploy low production ballast screening services wherever needed outside the boarders of the Republic of South Africa., and to all persons working on or visiting the Transnet managed work sites. The requirements specified in this document are applicable to the contractor as well as any sub-contractors, EPCM Contractors, Consultant, Vendors and Visitors that may be appointed by Transnet as an Employer. It is the contractor's responsibility to ensure that all subcontractors comply fully with all legal requirements as well as the requirements of this health and safety specification.

3. Definitions

Acceptable Risk

A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)

The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

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Applicant (Permit to Work)
A person requesting permission to perform work for which a Permit to Work is required. Applicants shall be authorised (in writing) to receive (or accept) Permits to Work and shall be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)
A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the Transnet Contract Manager to issue Permits to Work within the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade
A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Consequence
The outcome of an event expressed qualitatively or quantitatively.

Contractor
An employer (organisation) or a person who performs **ANY** work and has entered into a legal binding business agreement contract to supply a product or provide services to Transnet. This applies to the Suppliers, Vendors, and Consultants, Service providers or Contractors performing construction work (includes Principal Contractor) **NB:** A Contractor is an employer in his/her own right

Contract Manager
Transnet employee appointed to liaise with the contractor to ensure that the specifications of the contract are met (with special emphasis on safety, technical specifications, inspection of quality and quantity of work). It includes a Technical Officer, Depot Engineering Manager, Engineering Technician, Engineer, Maintenance Supervisor's etc

Competent Person
A person who has in respect of the work or task to be performed the required knowledge, training, experience and qualification (as per Construction Regulation, 2014).

Confined Space
An enclosed, restricted or limited space in which because of its construction, location or contents, or any work activity carried on therein, a hazardous substance may accumulate or an oxygen deficient atmosphere may occur, and includes any chamber, tunnel, pipe, pit sewer, container, valve, pump, sump, or similar construction, equipment, machinery or object in which a dangerous concentration of gas, vapour, dust or fumes may be present.

Construction Supervisor
A competent person responsible for supervising construction activities on a construction site

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Clearance Certificate
A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Discipline Lock (many locks with a restricted number of identical keys)
Attached at a Lockout Station or at a Local Isolation Point in order to lock out a system, plant or equipment. A Discipline Lock (e.g. A Low Voltage Electricity Discipline Lock) is owned by an Isolation Officer who has been authorised in writing to isolate and lockout a particular hazard (e.g. Low voltage electricity).

Equipment Lock (many locks with one unique key)
Attached directly to pieces of equipment in order to lock them out. Equipment Locks may only be used by Isolation Officers who have been authorised in writing to perform isolation and lockout procedures. The key shall have a solid key ring that fits over an Isolation Bar.

First-Aid Injury (FA)
A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner. First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief).

Rail Road Vehicle
Means a vehicle that can travel on rail and road

Hazard
A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls
A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.
- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. Prevent contact with the hazard).

Isolation and Lockout Procedure
A plant or equipment-specific procedure that describes the method, and sequence to be followed, for rendering equipment, plant and systems safe to work on.

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Isolation Bar

A device used at a Lockout Station to which anyone is able to attach a Personal Lock making it impossible for an Isolation Officer to remove the key to the Equipment Locks, thus preventing the de-isolation of a system, plant or equipment while it is still being worked on. A Discipline Lock shall always be the first lock attached to an Isolation Bar and last to be removed.

Isolation Officer

A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the Transnet Contract Manager to perform isolation and lockout procedures. A person may only be appointed as an Isolation Officer if he has undergone training and has been assessed and found competent in the isolation and lockout of systems, plant and equipment within the scope of his designation.

Incident

An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood

A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more.

If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTI's multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
  - The vehicle's manufacturer; or
  - An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (SUVs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition shall be considered mobile equipment.

Medical Treatment Injury (MTI)

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A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. Stitches, removal of foreign body).

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competent

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Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, tele-handlers, drill rigs, buses and road-going trucks.

Near Hit
An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Occupational Health Practitioner
An occupational medicine practitioner or a person who holds a qualification in occupational health recognised as such by the South African Medical and Dental Council as referred to in the Medical, Dental and Supplementary Health Service Professions Act, 1974 (Act No. 56 of 1974), or the South African Nursing Council as referred to in the Nursing Act, 1978 (Act 50 of 1978)

Personal Lock
A single lock with one unique key controlled by the owner. Used for personal protection.

Regulation
In the context of this guideline, 'Regulation(s)' refers to the Construction Regulations, 2014 required by Section 43 of the Occupational Health and Safety Act 85 of 1993, published under Government Notice R 84 in Government Gazette 37305 of February 2014.

Risk
A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment
A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management
The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

4. Abbreviations

DSTI - Daily Safety Task Instruction
CR – Construction Regulations
EPCM - Engineering Procurement and Construction Management
HIRA - Hazard Identification and Risk Assessment
HEALTH AND SAFETY - Integrated Management System
MS - Management System
OHS Act - Occupational Health and Safety Act
SOC - Safety Observation and Conversation
VFL - Visible Felt Leadership
OHS - Occupational Health and Safety
SACPCMP - The South African Council for Project and Construction Management Professions,

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5. SHE Management Plan

The contractor shall prepare, implement and maintain a contract specific SHE Management Plan. The plan shall be based on the requirements set out in this specification, risk assessment as well as all applicable legislation. It shall cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan shall demonstrate the contractor's commitment to HEALTH AND SAFETY and shall, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**;
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable **Legal and Other Requirements**, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning **Health and Safety Objectives** – a process shall be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning **Resources, Accountabilities and Responsibilities** – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;
- Details concerning **Competence, Training and Awareness** – a system shall be in place to ensure that each employee is suitably trained and competent, and procedures shall be in place for identifying training needs and providing the necessary training;
- **Communication, Participation and Consultation** arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- **Documentation and Document Control** – project-specific documentation required for the effective management of health and safety on the project shall be developed and maintained, and processes shall be in place for the control of these documents;
- Processes and procedures for maintaining **Operational Control**, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- **Emergency Preparedness and Response** procedures;
- **Management of Change** – a process shall be in place to ensure that health and safety risks are considered before changes are implemented;
- **Sub-contractor Alignment** procedures – a process shall be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- **Measuring and Monitoring** plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. Noise, dust, etc.) In order to determine the effectiveness of control measures;
- **Incident Reporting and Investigation** procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- **Non-conformance and Action Management** procedures concerning the management of

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corrective actions;

- **Performance Assessment and Auditing** procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the **Management Review** process followed to assess the effectiveness of health and safety management efforts.

Prior to mobilisation, the SHE Management Plan shall be forwarded, to the Transnet Contract Manager for review. The plan will be audited for completeness and, if found to be adequate, will be accepted (typically "with comments"). Work may not commence until the plan has been accepted.

Any proposed amendments or revisions to the contractor's SHE Management Plan shall be submitted to the TRIM Contract Manager for acceptance.

Should it be identified that the contractor has overlooked a high-risk activity, and as a result has omitted the activity and associated control measures from the SHE Management Plan, the plan will not be approved.

6. Policy

The contractor shall develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety as required by OHS Act of 1993, 7(3) and SANS 3000-1:2016.

The policy shall be signed, dated and shall be reviewed annually. The policy shall commit to:

- Compliance with all applicable legal requirements;
- The effective management of health and safety risks;
- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents; and
- Achieving continual improvement with regard to health and safety performance.

All employees of the contractor as well as the employees of any sub-contractors that may be appointed by the contractor shall be made aware of the policy. This shall be done through Health and Safety Induction Training and Toolbox Talks.

A copy of the policy shall be displayed.

7. Hazard Identification and Risk Assessment.

Detailed hazard identification and risk assessment processes shall be followed for all work to be performed as well as for all associated equipment and facilities as required by legislation.

7.1 Baseline Risk Assessments

The client shall conduct a detailed Baseline Risk Assessment identifying foreseeable hazards and risk scenarios associated with the contractor's scope of work on the work site(s) as required by

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legislation and Transnet Contractor Management Procedure. The baseline risk assessment shall be used to develop this specification.

7.2 Task-Based Risk Assessments

The contractor shall ensure that effective procedures and risk assessment processes are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

The contractor shall carry out detailed project-specific Task-Based Risk Assessments which shall be facilitated by a competent person who has been appointed in writing. The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined shall participate in the risk assessment process. An attendance register shall be completed and retained.

A Task-Based Risk Assessment shall at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner);
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment shall be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement;
- Legislative changes; and
- Following an incident.

7.3 Pre-Task Hazard Assessments

A pre-task hazard assessment shall be completed before commencement of a task or whenever a change is identified while carrying out an activity. Before carrying out the particular task that involves the identified change, a few minutes shall be spent identifying the hazards and risks associated with that task as well as suitable control measures. Any deviation from what was discussed during the Daily Safe Task Instruction (prior to the activity commencing), or anything that was not discussed, constitutes a change.

8. Legal and Other Requirements

The Contractor shall comply with the requirements of all applicable legislation as well as Transnet and contract-specific standards and procedures as amended from time to time.

The Contractor shall compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register shall be updated regularly to ensure that it remains relevant.

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Applicable laws and standards shall be appropriately communicated to all employees of the contractor (as well as the employees of any sub-contractors that may be appointed by the contractor) through training, Toolbox Talks, and Daily Safe Task Instructions.
The Contractor shall submit proof of registration and Letter of Good Standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Diseases Act , 1993 (Act No. 130 of 1993) for his company and each of his subcontractors'.

No contractor may do any work for TRIM without a valid letter of good standing. The Contractor shall ensure that the Letter of Good Standing remains valid for the duration of the contract period. The letter of good standing shall reflect the name of the Contractor and/or Sub-contractor, registration number and, expiry date

9. Objectives

In order to drive continual improvement, the contractor shall set contract-specific and measurable objectives, and develop improvement action plans to achieve these objectives. These objectives shall be aligned with the objectives set for the contract as a whole.

Eliminating hazards, minimising risks, preventing incidents, injuries and illnesses, and ensuring legal compliance shall be the primary considerations for setting objectives.

When setting objectives, consideration shall be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;
- Lagging indicators (i.e. Incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is "no harm".

The improvement action plans shall specify adequate resources required to achieve the objectives, the person's responsible, and realistic timeframes for completion.

The objectives and associated improvement action plans shall be documented and communicated to all contractor employees. Furthermore, to ensure that the objectives remain relevant, they shall be reviewed on a yearly basis and whenever significant change has taken place (i.e. Changes to activities, scope of work, operating conditions, etc.).

Performance reviews shall be carried out at quarterly intervals to assess and document performance against these personal or team objectives.

If a reward or incentive scheme is introduced, it shall be designed in such a manner that health and safety performance is not compromised in order to maximise financial reward.

10. Resources, Accountabilities and Responsibilities

The Contractor shall adequately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the contractor's HEALTH AND SAFETY management system for the contract. The contractor shall comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the contract

An organogram specific to the contract shall be documented and maintained. All roles that carry HEALTH AND SAFETY accountability and / or responsibilities shall be included, and all individuals that carry health and safety appointments shall be clearly identified and appointed in writing.

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Documented proof of each appointment shall be retained.
The contractor's managers and supervisors at all levels shall demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals shall consistently take immediate and firm action to address violations of health and safety rules, and shall actively participate in day-to-day activities with the objective of preventing harm.

The contractor's management representatives are responsible and accountable for health and safety performance. All costs associated with meeting these responsibilities shall be borne by the contractor.

Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

10.1 Contractor Construction Manager

The Contractor shall appoint a competent Construction Manager who shall be responsible for the successful and safe completion of all work to be carried out by the contractor, including the duty of ensuring occupational health and safety compliance.

The appointed Construction Manager may not manage any work on or in any site other than the site in respect of which he or she has been appointed.

The contractor shall upon having considered the size of the project, in writing appoint one or more Assistant Construction Managers for different sections thereof: Provided that the designation of any such person does not relieve the Construction Manager of any personal accountability for failing in his or her management duties in terms of this regulation.

10.2 Contractor Health and Safety Officers

The contractor shall appoint a full-time Construction Health and Safety Officer for the duration of the contract who is registered with the SACPCMP (The South African Council for Project Construction Management Professions).

The Construction Health and Safety Officer shall have sound knowledge of the Occupational Health and Safety Act and its regulations, SANS 3000-1:2016, National Environmental Management Act, and associate environmental requirements such as Waste and Water Acts and Hazard Identification and Risk Management processes.

The contractor shall ensure that each Construction Health and Safety Officer is adequately equipped to enable him to perform his duties effectively.

10.3 Contractor Supervisors

The contractor shall ensure that all works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience in the type of work being carried out.

No work may be carried out without an appointed supervisor being physically present in the work area and daily safety task instruction. The Construction Supervisor appointed may not supervise any work on or in any site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated under on all the relevant sites, the appointed construction supervisor may supervise more than one site.

Each supervisor shall accept these responsibilities in writing as part of his appointment and shall be provided with all the necessary equipment to enable him/her to perform his responsibilities.

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The contractor shall, upon having considered the size of the work to be performed, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor, and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation

10.4 Health and Safety Representatives

The team of employees on site shall have a health and safety representative deployed on the work site(s), a Health and Safety Representative shall be elected and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor shall ensure that an adequate number of Health and Safety Representatives (at a minimum ratio of one Health and Safety Representative per 50 employees) are elected and appointed to effectively represent all site personnel as required by the OHS Act 85 of 1993, section 17 - 18.

Each Health and Safety Representative shall attend a training course for health and safety representatives. The cost of this training shall be for the contractor's account.

The contractor shall make the necessary allowances for the Health and Safety Representatives to carry out their duties as specified in the applicable legislation.

The contractor shall ensure that an appropriate method of identification of each Health and Safety Representative by employees on site.

10.5 First Aiders

The Contractor shall ensure that their employees receive prompt first aid treatment in case of injury or emergency. The contractor shall have the necessary equipment and/or facility on site for treatment of injured persons.

If 10 or more employees are deployed on the work site(s), at least one trained and competent First Aider shall be in place and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor shall ensure that an adequate number of First Aiders (at a minimum ratio of one First Aider per 50 employees) are in place and have been appointed to administer first aid treatment should this be required.

First Aid training shall be done through an accredited training institution. The cost of this training shall be for the contractor's account.

The contractor shall ensure that an appropriate method of identification of each First Aider by employees.

10.6 Duties of Client

Transnet shall perform the duties of a client as per the Construction Regulations of 2014, Railway Safety Act 30 of 2024, SANS 3000-1:2016 and Transnet Contractor Management Procedure.

Transnet shall appoint a Construction Health and Safety Agent who is registered with the SACPCMP who shall ensure that the duties of Transnet as the client as per Construction Regulation 5 are performed and complied with. The Construction Health and Safety Agent shall be involved in all stages of contract management and take charge of all the health and safety related matters on behalf of Transnet.

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10.7 Operational legal appointment letters

The contractor shall ensure other legal appointment letter are compiled and be submitted with the Contractor compliance plan. Below is some appointment required as per the legislation, the appointment letters vary based on the scope of work;

- OHSA Sec 16(2)
- Sec 17,18,19 SHE Representative
- GSR 3(4) First Aider
- GAR 9(2) Incident investigator
- GMR 2(1) Supervisor of machinery
- GMR 2(7) Assistant Supervisor of machinery
- CR 4(1)(c) Principal Contractor
- CR 8(1) Construction Manager
- CR 8(2) Assistant Construction Manager
- CR 8(7) Construction Supervisor
- CR 8(8) Assistant Supervisor of construction work
- CR 8(5) Construction Health and Safety Officer
- CR 9(1) Construction Risk Assessor
- CR 10(1)(a), (b) Fall protection plan
- Developer
- CR 10(2)(d) Inspector of fall arrest system
- CR 14(2) Scaffolding Supervisor
- DMR 17(2),18 Inspector of lifting machinery
- CR17(8) Material hoist Inspector
- CR 19(2)(g)(i) Explosive powered tool issuer
- CR 23(1)(k) Construction vehicle and mobile plant Inspector
- CR 24(d) Temporary Electrical Installation Controller
- CR 24(e) Temporary Electrical Installation Inspector
- CR 28(a) Stacking and storage Supervisor
- CR 29(h) Fire extinguisher inspector
- EMR 8(8) Appointment for electrical installation in hazardous location- Master Electrician (Inspector)
- EIR 9 Installation Electrician appointment

11. Cost of health and safety

The Contractor shall ensure that it has made adequate provision for the cost of health and safety measures in the tender offer. The Contractor shall ensure that its subcontractors have made
adequate provision for the cost of health and safety measures in the tender offer.

12. Competence, Training and Awareness

Each employee (including sub-contractor employees) shall be suitably trained and competent, and shall understand the health and safety hazards, risks and control measures associated with his work.

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The contractor shall implement systems and procedures to ensure that the necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) shall be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis shall be carried out based on the competency profiles and a training matrix shall be developed for the scope of work.

Roles requiring technical certification, registration or licensing are identified and documented, and these roles are filled only by suitably qualified personnel;

All employees hold and maintain the required competencies and are under competent supervision. Refresher training is carried out as required. Records of education, qualifications, training, experience and competency assessments are maintained on site for all employees. The effectiveness of training is reviewed and evaluated;

Prior to the commencement of any work, including mobilisation and site set-up activities, the contractor shall provide, to the satisfaction of the nominated contract management representative, current documentation verifying that the contractor's employees, as well as the employees of any appointed sub-contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

The Contractor and sub-contractor shall ensure that all identified training as per training matrix takes place.

A contractor shall at all times keep on his or her work site, records of the health and safety induction training and such records shall be made available on request to an inspector, the client, the client's agent or the principal contractor.

An Employee Profile (dossier) shall be completed for each employee who will be performing work on site. All documentation pertaining to an employee's competence (i.e. certified copies of qualifications, certificates and licences as well as proof of job skills, training and experience) shall be maintained in this dossier.

If it is determined through observation that an employee is not yet competent to carry out a particular task in a safe and capable manner, the employee will be required to cease work immediately and shall either be reassigned or be retrained at the contractor's expense.

The contractor shall ensure that the training institutions and trainers that are used are appropriately registered with a governing authority. Foreign qualifications held by employees in health and safety critical roles shall be verified against the requirements of local legislation.

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12.1 Induction Training

Each employee shall attend all mandatory induction Training applicable to the work activities and Health and safety induction training pertaining to the hazards prevalent on the site at the time of entry. No employee will be permitted to enter any work site until he has attended this training. The contractor shall keep the proof of induction on the contractor compliance file.

Furthermore, employees shall attend (where applicable) Area/job-Specific Training pertaining to the particular hazards identified in the area(s) where the employees will be working. No employee will be permitted to enter a work area until he has attended the relevant area/job-specific training.

12.2 Specific Training and Competency Requirements

An employee shall be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

The contractor shall make arrangements with the Transnet Contract Manager for training that are only offered or unique to Transnet. Such training shall be for the cost of the contractor.

13. Communication, Participation and Consultation

The contractor shall establish and maintain effective communication and consultative processes for the duration of the contract to ensure that employees are kept up to date with regard to critical, health and safety related information and prompt feedback is provided.

13.1 Toolbox Talks

The contractor shall prepare a Toolbox Talk on a weekly basis and shall share it with all personnel for which the contractor is responsible (including all sub-contractors). Toolbox Talks shall address health and safety issues that are relevant to the work performed on the work site(s) and shall include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records shall be kept and maintained in the contractor's compliance file.

13.2 Daily Safe Task Instructions (DSTI's)

At the start of each day or shift, prior to the start of any work, each appointed supervisor shall inspect the work area for which he is responsible and ensure that it is safe. He shall then conduct a Daily Safe Task Instruction (DSTI) with his work team specifically concerning the tasks that they will be performing during the course of the day or shift. The relevant Task-Based Risk Assessment for the activity shall be used as the basis for the discussion. The correct work method shall be reiterated, and the identified hazards, risks and control measures shall be discussed with the team.

If the work method changes after activities have already begun, the DSTI shall be revisited and updated with the team, and the changes shall be signed off by the relevant contractor Construction Manager.

Every member of the work team shall sign the DSTI attendance register and records shall be kept and maintained in the contractor's health and safety file.

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The contractor's Health and Safety Officer shall evaluate the content of the DSTI's to ensure that they are task specific.

13.3 Suggestions

All employees shall be encouraged to submit suggestions to enhance health and safety management on the work site(s). A process shall be in place for documenting, evaluating, implementing (as appropriate), archiving and recognising the improvement ideas.

13.4 Meetings

13.4.1 Contractor health and safety (OHS Act Section 19)

The contractor shall schedule and hold health and safety meetings at least quarterly and keep minutes of each meeting and attendance records in the contractor compliance file.

The meeting shall address the following as a minimum:

- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections (including H&S Rep inspections) or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

13.4.2 Site Meetings

In addition to the contractor health and safety meetings, the Transnet Contract Manager will schedule and chair monthly Site Meetings that the contractor shall attend.

The meeting will address the following as a minimum:

- Feedback from the contractor concerning health and safety performance for the period;
- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

13.5 Health and Safety Notice Boards

The contractor shall where practicable, provide and maintain a Performance Board that shall display the health and safety performance indicators, and a site plan indicating evacuation routes and emergency assembly point locations.

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13.6 Involvement (Other)

The participation of all contractors (and sub-contractor) employees in activities that promote improvements in health and safety performance shall be encouraged. In particular, this shall include their appropriate involvement in:

- Hazard identification, risk analysis and determining control measures;
- Incident investigation; and • Reviewing policy and objectives.

14. Documentation and Document Control

The contractor shall establish a process for the systematic control of health and safety records and related data. Controls shall be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.
The document control process shall:

- Provide for the review, revision and version control of documents;
- Uniquely identify documents (as appropriate) to control their use and function;
- Require approval of the documents for adequacy prior to issue;
- Clearly identify changes and record the status of any revisions to documents; and
- Provide for the effective distribution of documents to, and where necessary the timely removal of obsolete documents from, all points of issue and use.

Each record shall be legible, identifiable and traceable, and shall contain adequate information and data for its purpose. The retention, confidentiality and security of records and data shall be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

Personal information originating from medical surveillance and occupational hygiene monitoring shall be reported in a form that respects the privacy of the individual but enables management to fulfil their duty of care obligations to employees.

14.1 Contractor compliance File Requirements (Health and Safety File)

The contractor shall compile and maintain a file containing all necessary compliance related documentation. Transnet should provide construction work permit and to be kept on site at all times. The contents of the file will be audited by a Transnet Contract Manager or any person delegated by him on a monthly basis.

Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Compensation Commissioner or Licensed Insurer;
- Proof of Public Liability Insurance;
- Scope of Work under the contract;
- List of Contacts and their Telephone Numbers;
- Health and Safety Policy;
- SHE Management Plan;
- Client Health and Safety Specification
- Section 37(2) Mandatory Agreement

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- Legal Register;
- Organisational Chart for the contract;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress;
- Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- Fall Protection Plan (for work at height);
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;
- Inspection Registers, Forms and Checklists;
- PPE Issue Registers;
- Material Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing: a copy of the employee's Identity Document or Passport, Valid Medical Certificate of Fitness, Training Records, Certificates of Competency; and Copies of Licences;
- Meeting Minutes;
- HEALTH AND SAFETY Performance Reports;
- Copies of Inspection and Audit Reports; and
- Daily Safe Task Instructions (DSTI's) and Toolbox Talks.

The contractor shall ensure that an equivalent file is compiled and maintained by each appointed sub-contractor. A copy of the compliance file shall be provided to the Transnet at the end of the contract.

15. Notification of Construction Work

A contractor who intends to carry out any construction work other than work contemplated in Construction Regulation 3(1), shall at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will—

- include excavation work;
- include working at a height where there is risk of falling;
- include the demolition of a structure; or
- include the use of explosives to perform construction work.

A contractor who intends to carry out construction work that involves construction of a single storey dwelling for a client who is going to reside in such dwelling upon completion, shall at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 of the CR regulations.

16. Operational Control

For contract operations and activities, the contractor shall implement and maintain:

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- Operational controls, as applicable to the organization and its activities;
- The organization shall integrate those operational controls into its overall OH&S Management System;
- Controls related to purchased goods, equipment and services;
- Controls related to contractors and other visitors to the workplace;
- Documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- Stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

16.1 Safe Work Procedures

The contractor shall develop, document and implement Safe Work Procedures for all activities involving significant health or safety risk. These procedures shall detail the control measures required to effectively manage the health and safety risks associated with the work activities.
Each Safe Work Procedure shall be consistent with the Task-Based Risk Assessment completed for the activity.

Every person engaged in an activity for which a Safe Work Procedure has been developed shall receive suitable training on the procedure.

Furthermore, the contractor shall develop, document, communicate and implement formal procedures, work instructions and / or programmes for the operation, maintenance, inspection and testing of all plant and equipment (including protective systems and devices) brought onto the project site(s).

16.2 Railway Safety Act 30 of 2024

The Contractor shall ensure that its equipment, machinery and employees when on TRIM premises complies fully with all applicable railway safety act requirements and/or regulations the relevant SANS Codes of Practice.

The Contractor when engaging subcontractor shall review the capability of the proposed contractor to comply with specified railway safety requirements and/or regulations.

The Contractor and/or his subcontractors shall grant TRIM access, during the term of the contract, to review any railway safety related activities, including the coordination of such activities across all parts of the organisation.

The Contractor shall ensure that where applicable, such work is performed by person who has the necessary competencies as required in terms of any applicable railway safety standard or code of practice

The Contractor shall ensure that all his employees are protected from the risk of being hit by moving trains.

The Contractor shall ensure that on track machines are only operated with the Transnet Track inspector/Track master in charge of on-track machine present on the machine. Transnet Track inspector/Track master in charge of on-track machine shall

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have passed the appropriate road knowledge, theoretical, practical examinations and shall be licenced and competent.

16.3 Planned Task Observations

All contractor, management supervisors shall perform Planned Task Observations (PTO's) to verify that the control measures that have been identified in Safe Work Procedures (and associated Risk Assessments) are being adhered to and are being properly implemented, and to provide guidance where deviations are noted.

Each supervisor shall complete at least one PTO per day involving one or more employees in his work team.

When an unsafe act or condition is identified, the supervisor shall coach the work team to correct the act or condition in line with the Safe Work Procedure.

Where valid changes to the work method are identified, the supervisor shall ensure that the Safe Work Procedure and Risk Assessment are updated to reflect the current practice. Transnet Contract Manager may carry out PTOs on contractor employees on an ad hoc basis. Should deviations from the contractor's Safe Work Procedures be observed, the work may be stopped until these deviations are rectified.

16.4 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;
- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an ipod (or similar) whilst working on site;
- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and

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- Pouring / pumping / flushing any substance (chemical / hydrocarbon / wastewater) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.
- Walking, sitting or sleeping on the rail
- Touching of any loose lying electric wires
- Coming into close proximity to live OHTE (maintain clearance of 3 metres)

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the Transnet Contract Manager shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

16.5 Site Access

The Contract Manager shall issue a site access certificate to the contractor after he has evaluated and is satisfied with the contractor compliance file.

16.5.1 Access Control and Security

The contractor shall comply with all access control, procedures and systems applicable to the work site. Failure to comply with these requirements will be viewed as a serious safety breach and may result in the permanent removal of the individual(s) / contracting company from site or suspension without payment.
No access card will be issued unless valid proof of identification is provided. For foreign labour, an access card will only be issued if a valid work visa is produced.

The contractor shall assess the security risks and implement appropriate measures. Where such measures include hiring of contract security services, the Contractor shall inform the Transnet Contract Manager and obtain written authorisation. All contractors are to strictly adhere to all security requirements on the premises.

16.5.2 Trespassing

The contractor shall ensure that no employee (including sub-contractor employees) trespasses on any land lying beyond the boundaries of the work site. The contractor's activities shall be confined to the specified work areas, and access to these areas may only be by means of specified routes.

If instructed by a Transnet Contract Manager to do so, the contractor shall remove any employee who fails to comply with this requirement from the work site.

16.5.3 Visitors

Visitors (including reps and suppliers) shall be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and shall arrive with all of this PPE.

All visitors shall sign in the visitor's register and undergo a visitor induction briefing before entering the site. A visitor access card will be issued to each visitor on conclusion of the induction briefing.

Whilst on site, visitors shall be accompanied at all times by an appropriately senior employee who has been inducted fully.

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When leaving the site, each visitor shall return his or her visitor access card to the security personnel posted at the entrance / exit. A visitor will not be permitted to leave the site until he or she produces the access card that was issued.

Note: Any request (typically made by a government official) to carry out a site inspection shall be referred to the Transnet Contract Manager. The contractor shall not arrange any such inspection without prior approval from the Transnet Contract Manager.

16.5.4 Alcohol, Drugs and Other Intoxicating Substances

The contractor shall ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance. Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.

A drugs and alcohol testing program will be implemented. Persons entering the site will be randomly tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person has the opportunity to rather report that he/she is under the influence before accessing the work site – in this case the employee may only be send home for the day but will then be tested for the following five days (each day) on his return to the site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the work site. It shall be the responsibility of the Transnet Contract Manager to take disciplinary action and remove such a person's form the site.
Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee shall be removed from the site. This may be done without testing.

Note: All personnel involved in an incident / accident shall immediately be subjected to an alcohol test and a drug test as part of the investigation.

16.5.5 Firearms, Ammunition and Offensive Weapons

Firearms, ammunition, and offensive weapons of any kind are strictly prohibited. No person may enter /shall not be permitted to enter the site carrying any such item.

16.5.6 Vehicles

All vehicles brought onto site shall meet the safety requirements. All road-going vehicles used by the contractor on the site shall be roadworthy and registered with the relevant traffic authority. A vehicle will not be permitted to enter the site in an un-roadworthy condition.

No vehicle shall be permitted to enter the site unless it is duly authorised. Access permits are vehicle-specific and may not be transferred between vehicles.

The contractor shall allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises. The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.

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The driver / operator of any vehicle / mobile equipment shall carry a copy of his appointment with him at all times. Each driver / operator shall:

- Comply with all site rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
- Obey all road signs;
- Obey all instructions given by security or emergency services personnel;
- Remain within the boundaries of the site; and
- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.

When not in operation, the contractor's vehicles / mobile equipment shall be parked within the boundaries of his lay-down area or yard. Parking is only permitted in designated parking areas. All cars are parked on site at the owner's risk.

In the event of a vehicle accident on site, the driver(s) shall report the incident immediately and shall remain at the scene until a Transnet Contract Manager arrives, or until a Transnet Contract Manager authorises him to leave (unless, of course, the driver requires medical attention).

16.6 Mobile Equipment and Light Vehicles

Contractor shall ensure all light vehicles and mobile equipment to be used (including, but not limited to, lift and carry cranes (or mobi-lifts), mobile cranes, forklifts, mobile elevating work platforms (e.g. Cherry pickers), tractors, dozers, dump trucks, haul trucks, graders, excavators, loaders, back-actors, drill rigs, and road-going cars, light delivery vehicles, and trucks) comply with the requirements of all applicable legislation. The contractor remains responsible for meeting this requirement even if the equipment to be used is leased or provided by a sub-contractor (i.e. not owned directly by the contractor).

An Equipment Profile (dossier) shall be compiled for each light vehicle and each item of mobile equipment to be used on the site.

All mobile equipment and light vehicles (used for work purposes) shall be subject to a risk assessment. The assessment shall involve operators and maintenance personnel and address all aspects of safe operation including handling, vehicle selection, vehicle journey, driver vision, brake failure, tyre blow out, and access and egress for operators and maintenance personnel.

Each light vehicle and each item of mobile equipment shall be serviced and maintained as prescribed by the manufacturer of the vehicle or equipment.

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No major repairs or services may be carried out on site. No repairs may be carried out by a driver or operator. Only suitably qualified and competent persons may carry out repair work.

An appropriate pre-operation safety check based on a risk assessment shall be carried out for each light vehicle or item of mobile equipment driven or operated for work purposes. For each vehicle or equipment type, an approved checklist shall be in place (and shall be used). The pre-operation check shall include, but not be limited to, inspection and / or testing of the following safety critical features:

- Brakes (testing method shall be provided);
- Wheels and tyres (including the spare);
- Lights and indicators;
- Steering;
- Seats and seat belts; and
- Windscreen and windows, including windscreen wipers and washers.

Should any critical feature be defective or damaged, the vehicle or equipment may not be operated until it has been fully repaired.

Supervisors shall review the completed checklists on a daily basis to satisfy themselves that there are no major deficiencies that could place a driver or operator at risk and that faults are attended to immediately. Records of inspections shall be kept in vehicle or mobile equipment.

No person may drive or operate any light vehicle or item of mobile equipment without authorisation. All drivers and operators shall be appointed in writing by the contractor's Construction Manager. No driver or operator may be appointed without proof that the individual has been trained, tested and found competent, or is currently licensed. Contractor shall implement a system for renewal of licences.

The appointment letter shall specify the type of vehicle or equipment for which authorisation is being given and shall clearly confirm that the driver or operator:

- Is 18 (eighteen) years of age or older;
- Has undergone a medical examination and has been declared fit for work by an occupational health practitioner; and
- Has received suitable training and has been found competent or is in possession of a valid driving licence issued by a state, provincial or civil authority that is applicable to the class of vehicle or equipment that is to be driven or operated.

The principal accountability for preventing accidents and incidents lies with the driver or operator of a light vehicle or item of mobile equipment, as he is in full control of any given situation at any given time. It shall be stressed to each driver and each operator that safety is his prime responsibility – this shall be clearly instructed and understood.

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Drivers and operators shall be empowered to stop driving or operating immediately should an unsafe condition arise and refuse to drive or operate any light vehicle or item of mobile equipment that is defective and / or has any inoperative safety features. Similarly, a supervisor shall never force a driver or operator to drive or operate a defective vehicle or item of equipment.

If a driver or operator does not adhere to the site rules and regulations, his appointment shall be withdrawn, and he shall not be permitted to continue with his duties. If necessary, site access will be denied (either temporarily or permanently) to any driver or operator who is deemed to not be adhering to site requirements.

No person may drive or operate a light vehicle or item of mobile equipment if he suffers from a medical condition that places both him and those around him at risk of injury. A fit-for-work policy shall be in place, incorporating clearly defined maximum levels of drugs (including prescribed medication) and alcohol permitted in the system of a driver or operator. Daily alcohol testing and random drug testing shall be carried out.

Supervisors shall regularly check on the physical condition of drivers and operators during the course of a shift. A system shall be in place to manage driver fatigue.

No eating or drinking is permitted while driving or operating a light vehicle or item of mobile equipment.

A mobile phone, whether hands-free or not, may only be used by the driver or operator of a light vehicle or item of mobile equipment when the vehicle or equipment is stationary and in a safe location.

Behaviour-based observations and coaching shall include the operation of light vehicles and mobile equipment.

A site-specific traffic management plan shall be compiled and submitted to the Transnet Contract Manager for approval. The design and layout of the road system (including entrance and exit points, intersections and other potential points of interaction between pedestrians, light vehicles and mobile equipment) shall be reviewed periodically. A risk assessment shall be carried out prior to any changes being made to traffic movements or road systems.

Designated walkways (both indoors and outdoors) shall be provided for pedestrians, and pedestrians shall make use of these walkways. Good lighting shall be provided along all walkways, particularly at road junctions. Wherever possible, rigid barricading shall be used to separate pedestrians from moving light vehicles and / or mobile equipment.

No pedestrians are permitted on haul roads (or as far as this can reasonably be achieved in situations where a haul road runs through an area occupied by a local community). All personnel shall be transported to site and shall be dropped off at a

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designated area. Pedestrians and cyclists shall give way to light vehicles and / or mobile equipment except at pedestrian crossings.

Controls shall be in place to ensure the safety of people working on roads, including those working on broken-down vehicles.

Speed limits and traffic rules shall be reviewed regularly and shall be rigorously enforced. Local traffic rules shall be complied with at all times.

All light vehicles and mobile equipment shall give way to emergency vehicles.
Pedestrians and light vehicle drivers shall be made aware of the blind spots associated with mobile equipment.

The driver or operator of a light vehicle or item of mobile equipment shall stop the vehicle or equipment and sound the horn before proceeding at blind corners, where his view of the path or intended path is obstructed, and when entering or leaving a building.

Whenever a light vehicle or item of mobile equipment is stopped or parked, the handbrake (if applicable) shall be applied. Measures (such as chocking or the use of ditches or trenches) shall be in place for the immobilisation of parked mobile equipment. A parked light vehicle shall be chocked in situations where the vehicle would roll forwards or backwards if placed in neutral with the handbrake disengaged.

No light vehicle or item of mobile equipment may be left unattended with the engine running or with a key in the ignition.

No light vehicle or item of mobile equipment may be parked so as to cause an obstruction to any roadway, passage or access way. No light vehicle or item of mobile equipment may be parked within 50 metres of a loading or off-loading point.

Light vehicles and mobile equipment shall be loaded safely. All loads shall be secure and shall be within the load limit of the vehicle or equipment. A load shall be properly secured before the vehicle, or equipment is set in motion. Adequate precautions shall be taken for any overhanging load.
No unauthorised light vehicle or item of mobile equipment may enter a restricted area or building.

16.6.1 Light Vehicles

All Contractors shall ensure that Light vehicles have the following minimum safety features:

- Fixed seats and suitable seats (safety) belts for all occupants (i.e. Driver and all passengers);
- Roll-over protection for all vehicles intended to be driven on dirt or steep roads;
- Cargo barriers and load restraints for all vehicles designed for carrying loads other than passengers), or that are unable to have cargo separated from the occupant carrying space of the vehicle; and

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- An air bag on the driver's side, and where available as a manufacturer fitted item, a passenger's air bag;
- A Reverse Alarm.

All Contractors shall ensure that Light vehicles that interact with mobile equipment are equipped or fitted with:

- Systems that enable positive communication with the equipment operators (e.g. a two-way radio);
- A high visibility flag (e.g. A whip flag or buggy whip);
- An amber flashing light (revolving or strobe);
- Reflective taping; and
- High visibility signage (i.e. Vehicle call numbers) facilitating easy and positive identification from a reasonable distance.

All Contractors shall ensure that Light vehicles carry:

- Emergency roadside triangles or beacons (three of either);
- Chock blocks for preventing uncontrolled movement of the vehicle when parked;
- A flashlight;
- A fire extinguisher (2.5kg DCP);
- A first aid kit; and
- Survival or emergency equipment (e.g. a vehicle recovery kit) suitable for the operating environment.

A change management process shall accompany all vehicle modifications, including the attachment of any equipment.

Should any safety critical feature be defective or damaged, the vehicle shall be withdrawn from service until it has been fully repaired. Inspection and maintenance shall be undertaken on critical features such as: • Wheels and tyres (including the spare);

- Steering, suspension and braking systems;
- Seats and seat belts;
- Lights, indicators and reflectors;
- Windscreen and windows, including windscreen wipers and washers;
- The vehicle structure itself; and
- Other safety-related items on the vehicle body, chassis or engine, including instrumentation.

Persons may only be transported in vehicles equipped with manufacturer fitted or approved seats and seat belts. Seat belts shall be worn by all occupants of a light vehicle (i.e. the driver and all passengers) at all times.

Only the driver and one passenger are permitted in the cab (front) of a light delivery vehicle. No personnel may be transported in the load-bin of a light delivery vehicle, even if the vehicle is fitted with a canopy. Only tools and equipment may be

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transported in the load-bin. Furthermore, no persons may be transported in a trailer behind a vehicle.

Light vehicle running lights (low-beam headlights) shall be switched on at all times when the vehicle is in operation.

All Contractors shall have a system is in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely.

16.6.2 Mobile Equipment

All Contractors shall ensure that Mobile equipment have the following minimum safety specifications:

- Fixed seats and seat belts for all occupants;
- Adequate lighting, including headlights, tail, turn and brake lights, and an amber flashing light (revolving or strobe);
- An identified isolation and lockout point;
- Adequate walkways, railings, steps and grab handle combinations, and boarding facilities including an alternative path of disembarking in the event of an emergency;
- Collision-avoidance technology and / or procedures;
- A reversing alarm or warning device;
- Chock blocks for preventing uncontrolled movement of rubber-tyred equipment when parked;
- A horn;
- Effective windscreen wipers;
- Effective guarding on accessible moving parts;
- A speedometer (if the mobile equipment is capable of exceeding the lowest applicable speed limit);
- High visibility signage (i.e. Mobile equipment call numbers) facilitating easy and positive identification from a reasonable distance; and
- A security system to prevent unauthorised operation.

Mobile equipment shall have the following minimum safety specifications, unless a risk assessment stipulates otherwise:

- Approved or certified roll-over protection;
- Fail-to-safe brakes;
- A fire detection and suppression system capable of being activated from both ground level and cabin level (for certain types of mobile equipment, a suitably sized fire extinguisher may be adequate);
- A non-handheld two-way radio or another form of communication;
- Falling object protection (a protective structure over the operator cabin);
- An enclosed and tight-sealing air-conditioned cabin with suitable protective glass; and
- A means of moving supplies and personal items into and out of the operator cabin that enables an operator to continuously maintain three points of contact while boarding and disembarking the equipment (e.g. A backpack or shoulder strap bag).

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When purchasing or hiring equipment, the ergonomics of the cabin shall be considered, specifically with regard to the seating, operator controls and retrofitted devices.

Fleet and control consistency shall be considered in order to minimise the possibility of operator error when changing machines.

Procedures shall be in place to ensure that mobile equipment is only operated on sufficiently stable surfaces and on gradients that are within the limits of safe operation.

Seat belts shall be used in all cases, by all occupants. Apart from the driver or operator, only an appointed flagman may be transported in mobile equipment (with the exception of buses) and **only if** the equipment is fitted with a passenger seat. No passengers are permitted on a lift and carry crane (or mobi-lift), mobile crane, forklift, mobile elevating work platform (e.g. A cherry picker), tractor, dozer, dump truck, grader, excavator, loader, back-actor, drill rig, or similar.
Procedures shall be in place for the safe isolation and lockout of mobile equipment.

Where two or more items of mobile equipment shall be operated in proximity to each other, or where an item of mobile equipment shall be operated in proximity to persons on foot, a risk assessment involving all persons who will be working in the area shall be conducted prior to the work commencing. In such a work area:

- No item of mobile equipment may be driven to within 5 metres of another item of mobile equipment without the operator first making eye contact with, and signalling his intentions to, the other operator who shall acknowledge that he understands and that it is safe to proceed.
- No person on foot may work or be positioned within 5 metres of an item of mobile equipment that is in operation. Before approaching mobile equipment on foot, a person shall make eye contact with, and clearly signal his intentions to, the operator of the equipment. The operator shall cease to operate the equipment and shall indicate that he understands and that it is safe to approach.

In certain circumstances (determined through risk assessment), mobile equipment may only move and operate with dedicated flagmen in place:

- Where flagmen are used, it shall be ensured that the flagmen, mobile equipment operators, and all other personnel working in the vicinity of the mobile equipment, receive suitable training with regard to signals and signalling to ensure effective communication. The training shall be formal and recorded, and competency shall be tested.
- A flagman and the mobile equipment operator that he is directing shall maintain eye contact. The flagman shall never position himself where the equipment operator cannot see him.
- Should a mobile equipment operator lose sight of his flagman, he shall stop his activities immediately until contact has been re-established.

Operators shall report conditions and practices that do not conform to procedure.

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16.6.3 Tyre and Rim Safety

A Tyre Management Plan shall be established to address issues including fire, heating, explosion, electrical contact, separations, maintenance, tyre changes, etc. and reviewed every twelve months. Safe Work Procedures shall be in place for all tyre maintenance and servicing activities and for tyre fire emergency response.

16.6.4 Roads

Roads with high risks activities and traffic interface shall be controlled by trained flagman, No road may be closed without permission from a Transnet Contract Manager.

A dust control plan shall be in place for the site and, in particular, for all roads. Any spillage in a roadway shall be cleaned up immediately. Ground pollution (e.g. Oil, diesel or hydraulic fluid spillages) shall not, and will not, be tolerated. If substances are spilled on a road or any other portion of the site, the contaminated ground shall be dug out and the resulting hole backfilled with clean material which shall be suitably compacted. The contaminated soil shall be disposed of as required by the applicable legislation.

16.7.6 Railroad Vehicles (RRV)

The Contractor shall ensure that Road-rail Vehicle (RRV) is only operated by a person who is competent and licensed to operate such RRV.

The Contractor shall ensure that the RRV is operated with the Transnet Track Inspector/Track Master in charge of on-track machine present on the RRV. Transnet Track Inspector/Track Master in charge of on-track machine shall have passed the appropriate road knowledge, theoretical and practical examinations and shall be licenced competent.

The Contractor shall ensure that the RRV is properly maintained and in a serviceable condition to operate on road and railway line.

16.7 Signs and Notices

The contractor shall ensure that all required safety signs and notices comply and are prominently displayed in accordance with the applicable legislation, national standards and good safety practice.

No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

16.8 Machinery

The contractor shall ensure that all plant and equipment brought onto the site is:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.
- Only operated by persons who have been trained to operate such machinery.

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The contractor shall supply, at his cost, all items of plant and equipment necessary to perform the work and shall maintain all items in good working order. Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the contractor shall, on instruction from the Transnet Contract Manager, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the Transnet Contract Manager.

Items of plant or equipment brought onto site by the contractor or his sub-contractors may be inspected by a Transnet Contract Manager. Should the Transnet Contract Manager determine that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, the contractor shall, on instruction from the Transnet Contract Manager, immediately remove the item from the site and replace it with a safe and adequate substitute. In such a case, the contractor or his sub-contractor shall not be entitled to additional payments or deadline extensions in respect of any delay caused.

16.9 Barricading

All applicable legislation concerning barricading shall be complied with at all times.

Each contractor required to erect barricading on the work site(s) shall develop, document and implement Safe Work Procedures that are aligned with the requirements of this specification.

Barricading shall be erected to:

- Prevent persons from making contact with an identified hazard;
- Provide warning of the existence of a hazard;
- Prevent unauthorised access (by people, vehicles and mobile equipment) into an area where a hazard exists or where a hazardous activity is being carried out;
- Define the boundaries of a hazardous location and / or restricted area; and
- Allow a work team to perform hazardous tasks without persons unfamiliar with the hazard(s) accessing the area.

Although not limited to these situations, barricading shall be erected or installed:

- Around excavations (trenches, pits, etc.) (refer to the Excavation Standard);
- To protect openings and edges (to prevent persons from falling, all openings and edges associated with floors, stairs, and the open sides of buildings and structures during the course of construction shall be protected by sturdy, rigid barriers capable of withstanding a force of at least 110 kilograms applied in any direction at any point) (refer to the Working at Heights Standard);
- To prevent access into areas where overhead work is in progress;
- To route vehicles safety through (or around) construction areas; and
- To protect members of the public who may be in the vicinity of a work or construction site (by preventing access).

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A barricade shall present a sturdy physical barrier to entering an area. Therefore, plastic cones, post and chain systems, "danger tape" and "snow netting" will not be accepted as barricading and may only be used for the purposes of low-risk demarcation.

Regardless of the type of barricade used, the following requirements shall be met:

- The installation, alteration and removal of barricades shall be supervised by a competent person;
- The barricading shall be uniformly and intelligently configured;
- The barricading shall be stable, conspicuous and effective;
- The barricading shall completely surround the work or hazardous area;
- General access requirements around the work or hazardous area (such as pedestrian walkways, operational access, or general thoroughfares) shall be taken into consideration when erecting a barricade;
- The extent of the area that is barricaded shall be kept to a minimum so as not to unnecessarily restrict access to other areas. If access routes to other areas are blocked by the barricade, alternative routes shall be identified and signposted
- All barricaded areas shall have properly designated points of entry and exit for persons and / or vehicles. Each pedestrian access point shall be fitted with a selfclosing gate. A sign indicating, "DESIGNATED ACCESS POINT – AUTHORISED PERSONNEL ONLY", shall be fitted to each gate;
- Additional signage providing warning of specific hazards (e.g. falling objects, electricity, etc.) Including, "NO UNAUTHORISED ENTRY", shall be attached to all gates and, where required, to the barricading itself. The signage shall be visible from all angles and shall be large enough to be read from a distance of 10 metres;
- Barricading shall be clearly visible at all times (day and night). If necessary, flashing warning lights shall be used;
- Tags shall be attached to the barricading displaying the name and cell phone number of the person responsible for the barricade, and specifying the reason for the barricading and the date on which it is scheduled to be removed;
- Should a person require access to a barricaded area, authorisation shall be obtained from the person responsible for the erection of the barricade. The hazards that are present and the Personal Protective Equipment that shall be worn within the barricaded area shall be communicated to the person seeking access;
- Each barricade shall be listed in a register, and each shall be inspected daily to ensure that it is still intact and that its positioning is still effective;
- All barricades shall be properly maintained and repaired as required;
- When the work has been completed and the hazard has been eliminated, all barricading shall be removed without delay. A barricade may not be left in place if no hazard exists;
- Before a barricade is removed (allowing general access), the area shall be inspected by the person responsible for the work that was carried out, to ensure that the area is once again safe. If applicable, the person accepting the area back for general use shall do so on completion of his own safety inspection;

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- Authorisation to remove (or modify) a barricade may only be granted by the person responsible for the erection of the barricade.

16.10 Working from fall risk position (working at heights)

All applicable legislation concerning work performed from a fall risk position shall be complied with at all times. Fall prevention or fall protection measures shall be in place whenever the potential exists for a person to fall from a fall risk position.

16.10.1 Fall protection

Whenever there is a risk of falling from a fall risk position, whenever there is a risk of falling onto dangerous equipment or machinery even if the potential fall distance is less than 2 metres, or whenever work shall be carried out within 2 metres of an opening through which (or an edge over which) a person could fall, no work may commence unless:

- a fall protection (and rescue) plan is in place (prepared by a competent person, and implemented by the contractor);
- A detailed task-specific risk assessment has been carried out;
- A safe work procedure is in place for the task to be performed;
- A permit to work has been obtained; and
- Each person has been provided with suitable fall protection equipment.

Fall protection equipment (either fall restraint or fall arrest equipment) shall be used at all times whilst the work is being carried out.
To prevent persons from falling, fall restraint equipment shall be used whenever work shall be carried out within 2 metres of an opening through which (or an edge over which) a person could fall. Fall arrest equipment shall be used whenever the potential exists for a person to fall 2 metres or more.

A person has been provided with suitable fall protection equipment if he is secured by means of an approved full body harness (well fitted) with two shock absorbing lanyards or an inertia reel (when fall arrest equipment is required) or two short restraining lanyards (when fall restraint equipment is required), double or triple action snap hooks (or karabiner type rings), and secure anchorage points (a person's lanyard may be attached either directly to an anchorage point or indirectly through the use of a variety of systems that incorporate a lifeline).

A dual lanyard system shall be used to ensure that at least one connection point is maintained at all times.
Note: When selecting fall arrest equipment, care shall be taken to ensure that the potential fall distance is greater than the height of the person plus the length of the lanyard with its shock absorber deployed (taking the height of attachment into account).

Anchorage points shall, where practical, be above the head of the person, and shall ensure that in the event of a fall the person will neither swing nor touch the ground.
All permanent anchorage points shall be designed and approved by a professional structural engineer.

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All anchorage points shall be periodically inspected and tested by a competent person to ensure that they are secure and can support the required load. A system shall be in place to identify anchorage points as authorised for use. Temporary anchorage points (and lifeline systems) may only be used if a competent person has certified them safe to use.

If an elevating work platform is used, such equipment shall be fitted with a fixed anchorage point for the attachment of fall protection equipment.

The use of fall protection (fall restraint or fall arrest) systems shall be avoided wherever and whenever possible through design, the installation of physical barriers that protect persons from falling and employing alternative methods of working.
Only if physical barriers protecting against free falls cannot be installed shall fall protection equipment be used.

Fall protection (fall restraint or fall arrest) systems are items of personal protective equipment and, if required, shall be purchased, installed and provided to employees.
Prior to commencing with any work at height, an assessment shall be conducted to determine if the work requires the use of fall protection equipment, and if so, which fall protection system is the most appropriate for the work.

There shall be a system for ensuring that fall protection equipment is:

- Tested and certified for use;
- Inspected by the user before use; and
- Destroyed following a fall or where inspection has shown evidence of excessive wear or mechanical malfunction.

All persons that are required to work at height (in order to carry out routine or non-routine tasks) shall first be trained and certified competent to do so. Furthermore, each person shall be in possession of a valid medical certificate of fitness specifically indicating that the person is fit to work at height.

All persons required to use personal fall protection equipment shall be trained and certified competent in the correct selection, use, maintenance and inspection of such equipment.

All fall protection equipment shall be thoroughly inspected on a monthly basis by competent persons appointed in writing and each item of equipment shall be tagged to show when it was last inspected. All inspections shall be recorded in a register. On finding defective or damaged equipment, appropriate action shall be taken by the competent person (i.e. the destruction of the equipment to prevent further use).

Persons making use of personal fall protection equipment shall do so in strict accordance with the instructions or requirements specified by the manufacturer or supplier of the equipment or system.

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Specific pre-use inspection, maintenance and fitting protocols shall be established in accordance with the manufacturer's requirements or guidelines and these protocols shall be followed by all users of the fall protection equipment.

Solvents may not be used to clean fall protection equipment. Only manufacturer-approved cleaning solutions may be used.

No person required to use personal fall protection equipment may work in isolation (a minimum of two persons working together is required).
Competent supervision shall be in place at all times for all work carried out at height. Supervisors shall be appointed in writing.

Emergency response (rescue) procedures for the rapid retrieval of suspended persons in the event of a fall from height shall be prepared and tested.

Note: Even though there is no risk of free fall, fall protection equipment may be required in situations where there is a risk of falling, slipping or sliding down a slope of more than 45 degrees.

Note: The maximum service life of fall protection equipment manufactured of synthetic fibre shall be 5 years from the date of first use and / or manufacture unless otherwise specified by the manufacturer.

A person may climb or descend a ladder without fall protection provided that he is able to use both hands and legs to do so, faces the ladder, and uses one step at a time. The ladder shall be tied off or supported at its base.

Prior to any roof work being performed, or prior to persons accessing a roof, a structural engineer shall verify that the roof is of sound construction and that it is capable of supporting the weight of the persons as well as any equipment that may be required. Should the engineer's findings be to the contrary, alternative methods of performing the work shall be found. Particular care shall be taken when work is carried out on an asbestos cement roof or a fibreglass roof.

16.10.2 Falling Objects

In the process of planning work activities, the risks associated with falling objects (i.e. materials, tools or equipment) shall be assessed and appropriate control measures shall be identified, implemented, and monitored taking the following hierarchy of controls into consideration:

- Preventing objects from falling – by using containment sheeting, toe boards, lanyards to secure tools (to a person or to the structure), ropes or chains to secure equipment (to the structure), lift boxes, brick cages, etc. and by properly securing loads when lifted by crane or hoist;
- Protecting people from falling objects – by establishing barricaded exclusion zones, installing catch platforms or catch nets, displaying warning signage, and posting safety watchers and / or traffic controllers; and

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- Personal Protective Equipment (particularly safety helmets and safety boots) – protective equipment is a last line of defence and shall be worn.

Where overhead work is being carried out, barricading shall be erected around the work area (at the level at which the work is taking place and at every level below including ground level) to prevent persons from entering such an area and potentially being struck by falling objects.
Wherever hazards related to falling objects exist, appropriate warning signage (i.e. "Overhead Work In Progress" and "No Unauthorised Access") shall be prominently displayed.

No items are permitted to lie loose in elevated positions (e.g. nuts and bolts shall be securely stored) and good housekeeping standards shall be maintained at all times. No tools, equipment, material, debris, waste, etc. may be dropped from height. Objects shall be lowered or chuted to ground level in a safe and controlled manner.

16.10.3 Ladders

All ladders used on site shall be of sound construction and adequate strength.
Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

The use of makeshift ladders is forbidden.
All ladders shall be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection shall be recorded in the register).

Before using a ladder, the user shall inspect it for damage. Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used. A damaged ladder shall be removed from service (and tagged, "Out of Service") without delay and shall then either be repaired (if possible) or destroyed to prevent further use.

Persons shall receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.

All portable ladders shall be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet shall always be placed (stand) on a firm level surface. The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited. Ladders may not be placed on movable bases such as boxes, tables, trucks, etc. The base or foot of a ladder shall always be secured to prevent it from slipping. The ladder shall be held by an assistant if the base cannot be secured in any other way (e.g. tied off).

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A straight ladder shall extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder shall be tied off (or otherwise secured to its support) to prevent accidental movement. A straight ladder shall be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder shall be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder shall be opened fully and the spreaders shall be locked securely.

When using an extension ladder, at least four rungs shall always overlap at the centre of the ladder.

Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) shall be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded. When a ladder is used near an entrance or exit, the base of the ladder shall be barricaded.

Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person shall always face the ladder and use both hands (i.e. maintain three points of contact). Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools shall always be properly secured. This can be achieved by attaching them to the wrist using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.

Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person shall climb down and reposition the ladder. No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.

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All ladders shall be properly maintained and cared for. Ladders shall be stored under cover and should be hung in a horizontal position from several brackets. No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it. No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings. Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders. Ladders shall be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person shall make an effort to remove mud, oil, grease, etc. from his boots.

16.11 Permit to Work

All personnel shall comply with the Permit to Work system applicable to the scope of work. A Permit to Work shall be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at height;
- A critical lift;
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

Note: A Permit to Work may only be issued by an Authorised Person, and may only be received (or accepted) by an appointed Applicant (see Definitions).

Each Permit to Work that is issued shall make reference to an approved Task-Based Risk Assessment for the work that is to be carried out.

The Permit to Work system that is employed shall incorporate the following basic procedures:

- Prior to meeting with the Authorised Person, the Applicant shall familiarise himself with all of the hazards associated with the system, plant, equipment, structure or area on or in which the work shall be performed. He shall also consider the risks that may arise as a result of the tasks that will be carried out. A Task-Based Risk Assessment shall be in place;
- The Applicant shall then request permission to carry out the work and shall meet with the Authorised Person to discuss and document the scope of the work as well as the hazards, risks and associated control measures. Isolation and lockout requirements shall be identified (if applicable). The isolation and lockout process shall be initiated by the Authorised Person who shall contact the necessary Isolation Officers.

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Note: The Applicant shall ensure his own safety and that of his team, and has the right to accompany the Isolation Officers to verify that all of the necessary locks have been fitted to all of the isolation and lockout points in accordance with the applicable plant or equipment-specific Isolation and Lockout Procedure.

- Once all of the necessary isolations have been completed and the necessary Clearance Certificates have been issued by the Isolation Officer(s) (if applicable), and the Authorised Person is satisfied that the system, plant, equipment, structure or area is safe to work on or in provided all identified precautions are observed by the Applicant, then he shall issue (sign) the Permit to Work to the Applicant;
- The Applicant shall accept (sign) the Permit to Work. If equipment has been isolated, the Applicant shall attach his Personal Lock to the relevant Isolation Bar (or Local Isolation Point) and shall ensure that every other person working on the isolated equipment also attaches his or her Personal Lock to the Isolation Bar (or Local Isolation Point) before starting any work;
- Before commencing with any work, the Applicant shall discuss the hazards, risks, control measures, precautions and limitations as stated in the Permit to Work (and associated Task-Based Risk Assessment) with all personnel who will be carrying out the work. A register shall be kept and all persons shall sign the register once they have been briefed by the Applicant;
- The work performed shall be limited to what is described in the Permit to Work;
- When a particular employee has completed his work, he shall sign the personnel register to this effect and (if applicable) shall remove his Personal Lock from the Isolation Bar (or Local Isolation Point);
- Once all work is complete, the Applicant shall:
  - Ensure that all machine guards have been replaced;
  - Ensure that all tools and materials have been removed from the work area; ○ Ensure that the work area is clean and tidy;
  - Ensure that all Personal Locks (including his) have been removed from the Isolation Bar or Local Isolation Point (if applicable); ○ Inform the Authorised Person that the work has been completed; and ○ Sign off the Permit to Work.
- Once the work is complete and the Applicant has signed off the Permit to Work, the Authorised Person shall: ○ Ensure that the relevant Isolation Officers perform all of the necessary de- isolations (if applicable);
  - On completion of the de-isolations, sign off the Permit to Work accepting the system, plant, equipment, structure or area back for service; and
  - Inform all relevant personnel that the system, plant, equipment, structure or area is ready to use.
  - Where the work shall continue over more than one shift, the Permit to Work shall be reviewed at every shift change by an Authorised Person. If the scope of work has changed, the permit shall be cancelled and a new permit shall be issued.

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If any of the original conditions or precautions pertaining to the work is not being complied with, is no longer adequate or is no longer applicable, the Authorised Person shall cancel the Permit to Work and shall ensure that all work stops until full compliance with either the original or amended (as required) conditions and precautions is achieved and a new permit has been issued.

The Applicant shall ensure that the Permit to Work (including the personnel register) is kept where the work is being carried out (i.e. posted on a portable Health and Safety Notice Board) and that the work is monitored against the permit conditions.

All Permit to Work records shall be retained and shall be made available for inspection when required.

The implementation of the Permit to Work system applicable to the project shall be audited on a regular basis by a Transnet Contract Manager. Furthermore, planned task observations shall be carried out periodically.

Note: In addition to obtaining Permits to Work as and when required for specific hazardous activities (identified in this specification), each contractor shall obtain a General Work Authorisation from a Transnet Contract Manager on a monthly basis. A General Work Authorisation is valid for one calendar month and authorises the contractor's planned work activities. In order to obtain a General Work Authorisation, the contractor shall provide a documented work plan for the month together with the necessary Task-Based Risk Assessments.

16.12 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, shall be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures shall be strictly enforced and complied to by all personnel.

All Isolation and Lockout Procedures shall incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks (see Definitions), and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;
- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and • Methods to test the effectiveness or completeness of the isolation.

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Note: No work may commence on a system, plant or equipment until a Permit to Work has been issued by an Authorised Person.

Note: A Permit to Work may only be issued by an Authorised Person once all required Clearance Certificates have been issued by appointed Isolation Officers.

The isolation and lockout system that is employed shall incorporate the following basic procedures:

- In accordance with a system, plant or equipment-specific Isolation and Lockout Procedure, an appointed Isolation Officer(s) shall isolate all points that need to be isolated in order to render the system, plant or equipment safe to work on. An Equipment Lock (and a suitable, highly visible warning tag) shall be attached to each isolation point;
- On completion of an isolation (and lockout), the Isolation Officer shall clear the area of all persons and shall then carry out tests to ensure that the isolation is effective. This may be done by pressing a start button or by asking a control room operator to try to start the equipment. Special care shall be taken to ensure that the attempted starting of the equipment has not been deactivated by another interlock forming part of the system, or by a different up-stream isolation. Alternatively, appropriate equipment may be used to test for energy (e.g. voltage verification or continuity tests).

Note: In the case of electrical isolation, a test for voltage shall be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer shall place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and shall then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock shall remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) shall be keyedalike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline.
  This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

Note: Local isolations do not require the use of Equipment Locks (a Discipline Lock may be attached to the Local Isolation Point by the Isolation Officer, followed by the necessary Personal Locks).

Note: For local isolations, if the Isolation Officer is the only person who will be working on the isolated equipment, then he shall attach his Personal Lock to the Local Isolation Point.

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- Once all required Discipline Locks are in place (i.e. attached to the Isolation Bar) and all Clearance Certificates have been issued, the Permit to Work may be issued by the Authorised Person;
- Each person who will be working on the isolated system, plant or equipment shall then attach his or her Personal Lock to the Isolation Bar before starting any work (including the Isolation Officer, if he intends to work on the isolated unit);
- The attachment of a Personal Lock to the Isolation Bar prevents the removal of the key to the Equipment Locks even if the Discipline Lock is removed;
- When called (by an Authorised Person) to de-isolate the system, plant or equipment (on completion of the work under the Permit to Work), the Isolation Officer shall ensure that all Personal Locks have been removed from the Isolation Bar before removing the Discipline Lock and the key to the Equipment Locks;
- Before removing the Equipment Locks and de-isolating the energy source, the Isolation Officer shall inspect the system, plant or equipment that was worked on to ensure that it is safe to perform the de-isolation. This includes guard inspections, housekeeping, ensuring that all doors and covers are in place, and most importantly, ensuring that no persons are present;
- Once all Equipment Locks have been removed and the system, plant or equipment is safe for use, the Isolation Officer shall cancel the Clearance Certificate and inform the Authorised Person that the unit has been de-isolated.

Where a system, plant or equipment is sequence interlocked and a hazard could be created through the inadvertent start up or shut down of a system, plant or equipment lying before or after the unit to be worked on, then that system, plant or equipment shall also be isolated and locked out.
Redundant or out of service equipment shall, in addition to being isolated and locked out using the relevant Discipline Lock, be fitted with a tag indicating why it is out of service, who performed the lockout, and the hazards associated with that equipment.

Where it is necessary to work on live equipment for the purposes of commissioning, testing, adjusting and sampling, such work shall be carried out in accordance with a written Safe Work Procedure and controls shall be in place to prevent unauthorised access into the work area.
The implementation of the isolation and lockout system and procedures applicable to the project shall be audited on a regular basis by a Transnet Contract Manager. Furthermore, planned task observations shall be carried out periodically.

16.12.1 Personal Locks

A Personal Lock shall be such that it can only be unlocked by the person to whom it belongs. Combination locks may not be used. A Personal Lock, as well as the key(s) to the lock, shall be kept under the exclusive control of the person to whom the lock belongs.

A Personal Lock shall be issued to each person who requires one, and the person's details shall be clearly and permanently engraved directly onto his Personal Lock. Alternatively, a thick durable plastic identification tag may be used that clearly displays the company's name, the employee's name, the employee's company number, and a

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contact telephone number (the tag shall be securely fastened to the Personal Lock). Where the above is hand written, it shall be done using a permanent marker pen and it shall be legible.

Each person issued with a Personal Lock shall be trained and certified competent in the correct use of such a lock.

A Personal Lock may NEVER be removed by anyone other than the person to whom it belongs, except if the removal (cutting) of the lock is authorised by the Transnet Contract Manager (in the absence of this person, authorisation can only escalate upwards). Furthermore, the removal of the lock shall be done under the personal supervision of the
Transnet Contract Manager, and in accordance with a written procedure. The removal (cutting) of a Personal Lock may be required if the person who applied the lock is unable or unavailable to remove it on completion of the work (e.g. lost his key, failed to remove his lock before going home, etc.).

16.13 Electrical Safety

The contractor shall ensure compliance with Electrical Installation Regulations, Electrical Machinery Regulations, OH&S Act, TRIM Electrical Safety Instructions, TRIM E7/1 Specification for Works On, Over, Under or Adjacent to Railway Lines and Near High Voltage Equipment and all applicable SANS Codes and Practices.

All electrical work shall be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the scope of work.

Each contractor carrying out electrical work on the site(s) shall develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

All persons who will be carrying out electrical work shall be certified against the requirements of job and equipment-specific electrical competency standards for the project, which shall address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards shall receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training shall address the equipment and conditions specific to the area where the individual will be working. The training material shall be documented and training records shall be kept.

16.13.1 Electrical Installations

Each electrical installation (temporary or permanent) installed or worked on by a contractor shall be inspected by a Transnet Contract Manager to ensure that the installation complies with all statutory requirements, codes, design criteria and safety standards applicable to the project.

A Transnet Contract Manager shall approve all electrical work before the installation is energised. Any installation deemed unsatisfactory by a Transnet Contract Manager shall be removed, repaired or modified by the contractor at his expense.

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For every permanent or temporary electrical installation, a certificate of compliance shall be issued by a competent and appropriately qualified electrician. These certificates shall be available for inspection.

Single line diagrams (with supporting documentation) shall be produced and maintained for all electrical installations. This information shall include system fault calculations, equipment details, electrical protection discrimination curves, and cable ratings.

Work on electrical installations (new installations, and modifications or repairs to existing installations) may only be carried out by qualified and authorised personnel (i.e. electricians).
Electrical safety devices (specifically, earth leakage protection and overcurrent protection) shall be installed on all distribution circuits and the settings shall be established by suitably qualified personnel.

A suitable numbering and / or labelling system shall be used so that each circuit breaker or earth leakage device can be clearly and readily matched with the outlet or equipment that it protects.

To ensure the safety of the user, each distribution panel shall be completely enclosed, shall be of the dead-front type, and shall be properly constructed and earthed.

All electrical cabling shall be covered (e.g. in cable trenches) or elevated (in cable trays) to protect it from damage and to eliminate tripping hazards.

All permanent and temporary electrical installations (cabling, sockets, distribution panels, transformers, switchgear, etc.) shall be inspected and tested by a competent and suitably qualified electrician on a monthly basis. The testing shall include a grounding (earthing) continuity test and testing of the electrical safety devices. Details of these inspections and tests shall be recorded in a register which shall be made available to the Transnet Contract Manager for inspection.

A rigorous Isolation, Lockout and Permit to Work system shall be applied to all electrical work (i.e. work on electrical installations, machinery or equipment). All personnel shall comply with the system and procedures applicable to the project.

Before any work on an electrical installation or equipment is carried out, the installation or equipment shall be de-energised.

No electrical work may be performed live, regardless of the voltage, unless written approval is obtained from the Transnet Contract Manager (a justification as to why it is necessary for the work to be carried out with the equipment in an energised state shall be provided).

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For all energised electrical work, a Safe Work Procedure shall be in place and, with the exception of voltage testing and where no tools are used, a Permit to Work (specifically authorising energised electrical work) shall be issued. When carrying out any energised electrical work, approved electrically insulated gloves, blankets, mats and other protective equipment shall be used.

Control centres, switchgear rooms, substations, generators, transformers, capacitor banks, and other similar electrical plant and equipment shall be appropriately guarded and labelled and, with the exception of emergency shut-off mechanisms, shall be made inaccessible to unauthorised personnel (i.e. plant or equipment of this nature shall be positioned within rooms or fenced enclosures which shall be kept locked).

Appropriate warning signage shall be prominently displayed within, and at all entrances to, these rooms or enclosures. The signage shall indicate that unauthorised persons are prohibited from entering, that unauthorised persons are prohibited from handling or interfering with any electrical plant or equipment, the procedure to be followed in the event of a fire, and the first aid procedure to be followed should a person suffer electric shock. Suitable fire-fighting equipment shall be provided in all such rooms or enclosures.

All electrical panels shall be kept locked (using keyed-alike padlocks). Keys may only be issued to authorised personnel.

All un-insulated (bare) or partially insulated conductors shall be enclosed and protected to prevent accidental contact therewith. Measures shall be taken to prevent unauthorised access and appropriate warning signage shall be conspicuously displayed.

Only authorised persons may enter rooms or enclosures housing electrical plant or equipment, and only authorised persons may access electrical panels or cabinets, and cable ducts or trenches. If any work shall be carried out in such an area or on such equipment, a Permit to Work shall first be obtained from the Transnet Contract Manager.

No connection to any electrical system may be made without prior approval and a valid Permit to Work from the Transnet Contract Manager.

No electrical equipment or apparatus may be modified without written authorisation from the Transnet Contract Manager.

Conductive ladders may not be used in proximity to non-insulated electrically energised lines or equipment.
All permanent and temporary electrical cables, whether energised or not, shall at all times be handled as if they are energised.

Only appropriately certified intrinsically safe electrical equipment may be used in flammable or potentially explosive atmospheres such as in confined spaces. Any

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equipment or structure on which electric charges may accumulate (such as storage tanks) shall be grounded (earthed).

Lightning protection shall be provided on all tall structures and buildings. Grounding (earthing) and lightning protection systems and devices shall be designed, engineered, selected and installed based on site-specific requirements.

Before carrying out any excavation work, a Permit to Work (specifically authorising the excavation activities) shall be obtained from the Transnet Contract Manager. Such a permit shall not be issued until it has been verified that no buried hazards or services exist where the excavation work is to be carried out (refer to the Excavation Standard).

16.13.2 Arc Flash Safety

Depending on the scope and nature of the work, a documented arc flash protection programme shall be in place that specifies:

- The methodology for calculating incident energies and determining flash protection boundaries; and
- The PPE required (specific to a task and the equipment on which the task is performed) and associated procedures to mitigate the hazard.

The method of calculation shall be based on regional electrical code requirements, or if none exist, the Institute of Electrical and Electronics Engineers (IEEE) Standard 1584, or the United States National Fire Protection Association "Standard for Electrical Safety in the Workplace" (NFPA 70E), or published equivalent.

An Arc Flash Hazard Assessment shall be carried out based on accurate and current data. All electrical cabinets where the potential for an arc flash hazard exists shall be labelled in accordance with the hazard assessment and the potential incident energies calculated.

A process shall be in place for updating the Arc Flash Hazard Assessment and labelling as changes and electrical upgrades occur that might affect the available short circuit current on the system.
In order to mitigate the hazard, Safe Work Procedures shall be in place and all persons potentially exposed to arc flash hazards shall be trained in these Safe Work Procedures and shall be supplied with appropriate arc flash PPE.

16.13.3 High Voltage Power Lines

Before any mobile equipment (such as a crane, bulldozer, back-actor, boom truck or drill rig) is mobilised to a work site, an assessment shall be carried out (including a thorough inspection of the work site and the access route) in order to clearly identify any overhead or underground power lines.

A system shall be in place to mitigate the risks associated with working in close proximity to power lines and suitable measures shall be taken to prevent personnel or equipment from coming into contact with power lines. Extreme caution shall be exercised.

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Where possible, exclusion zones (based on minimum clearance distances specified by the electrical power utility or the Transnet Contract Manager) shall be created with rigid barriers and warning signs.

Only in exceptional circumstances, and then only after a detailed method statement and risk assessment has been approved, all necessary mitigation or control measures are in place (including the use of a spotter), and a Permit to Work has been issued by the Transnet Contract Manager, may equipment be operated within one boom length of energised overhead power lines. Suitable protective insulating barriers may need to be used.

If possible, the power lines shall be de-energised and isolated while the work is carried out.

All equipment operators and rigging personnel shall be trained in the hazards and the applicable safe approach distances (exclusions zones) associated with overhead power lines.
A procedure shall be in place for the evacuation of mobile equipment or a vehicle in the event of accidental contact with power lines. All operators shall be trained in this procedure and shall follow it implicitly.

Scaffolding may not be erected within 5 metres of power lines or overhead track equipment.

16.13.4 Portable Electrical Equipment

Prior to site establishment, each contractor shall provide a complete inventory of all portable electrical equipment that he and his sub-contractors intend to use on the site (including plant, machines, appliances, generators, hand tools, lighting, extension cords, etc.). The nameplate data for each item of equipment shall be included.

All portable electrical equipment to be used on the site shall be supplied and maintained in a serviceable condition.

Any electrical equipment that is in poor condition or is not in proper operating order may not be used. Any electrical equipment that a Transnet Contract Manager deems to be unsafe or unsuitable shall be removed from site.

Electrical repair work or diagnostic work on electrical equipment may only be performed by personnel who are competent and authorised to perform this work (i.e. qualified electricians).

With the exception of double-insulated equipment, all electrical equipment shall have an equipment grounding (earthing) conductor that connects the frame of the equipment being utilised to the grounding (earthing) conductor of the electricity supply system.

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All electrical equipment and all electricity supply systems used (including generators) shall be inspected and tested by a registered and competent electrician to ensure that all equipment is properly grounded (earthed).

All electrical equipment used on site shall be supplied electricity through (i.e. shall be protected by) an approved and tested residual current device (or earth leakage device or unit). If a socket outlet does not have a residual current device in the circuit, a portable residual current device shall be used. Outlets without residual current device protection shall be labelled as such.

Any electrical equipment that causes an earth leakage device to trip or deactivate the circuit may not be used again until an electrician has inspected and tested the equipment and has recorded in a register that the equipment is safe to use.

Interlocks may never be removed or modified, and fuse terminals may never be bypassed to keep current flowing in any circuit.

All generators shall be fitted with suitable overcurrent protective devices (i.e. circuit breakers or fuses).

All generators shall be used in compliance with the manufacturer's requirements. Any proposed modification to a generator shall be authorised in writing by the manufacturer prior to the modification being made.

Each welding machine used on site shall be fitted with a Voltage Reduction Device (VRD). If this is not practical (i.e. for arc welding processes other than stick welding), a dead man's (isolation) switch in the electrode circuit (operated by a trained observer) may be used as an alternative. All welding machines shall be properly grounded (earthed).

All portable electrical hand tools used on the site shall be double-insulated.

Electrical equipment shall be disconnected or unplugged when not in use.

Portable lights shall be stable and each light bulb shall be protected by a substantial guard.

Temporary festoon lighting shall be double-insulated and shall be supported at least 2.5 metres above the floor, if possible.

Handheld lights shall be of the all-insulated type and shall be extra low voltage (i.e. not exceeding 32V). 120V or 240V handheld lights are not permitted.
Any lighting used in hazardous locations (i.e. potentially explosive atmospheres, confined spaces, and damp or wet areas) shall be operated at a maximum of 32 volts, unless earthed and protected by earth leakage devices.

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No person may wear a watch or any jewellery, or carry any metal objects such as a lighter or keys, while working on any electrical system or equipment.

No person may work on or use electrical equipment if his clothing is wet or any part of his body is in contact with water.

No person may handle electrical equipment, equipment cords or extension cords with wet hands or if the floor or ground surface is wet.

Fire extinguishers filled with carbon dioxide shall be used to fight electrical equipment fires (water may never be used). If possible, the electrical equipment should be deenergised before fire-fighting activities commence (refer to the Fire Protection and Prevention Standard).

When cleaning or performing maintenance work on an item of electrical equipment, the equipment shall be unplugged.

Equipment may not be unplugged while that equipment is switched on. Nor may equipment be plugged into a receptacle (socket) with the equipment's switch turned on.

Electrical equipment that has a defective plug or wiring may not be used. Repair work to defective or damaged electrical equipment may only be carried out by a qualified electrician.
Extension cords may be used for temporary applications only. Permanent cabling shall be installed for long-term needs. Extension cords may not be run through doors, windows, ceilings or holes in walls. An extension cord shall be uncoiled completely before it is used. An extension cord shall be of sufficient current-carrying capacity to power the equipment that it is supplying electricity to. Cords shall not be overloaded.

Extension cords shall be unbroken and continuous (i.e. no joins or splices in the cord are permitted). Extension cords may not be daisy-chained (i.e. one extension cord plugged into another extension cord). Extension cords and equipment cords may not be modified to fit a receptacle (socket).

Two-conductor extension cords may not be used. A three-conductor extension cord (i.e. a grounded or earthed cord) shall be used even if the equipment that it is supplying electricity to uses a two-prong plug.

Extension cords that are frayed, have insulation tears, cracks or abrasions, have exposed conductors, or have bent, broken or "spread" plug prongs may not be used.
Extension cords that will be used outdoors shall have heavy duty insulation and shall be weather and UV resistant.

All electrical equipment cords and extension cords shall be covered or elevated to protect them from damage and to eliminate tripping hazards.

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Each contractor is responsible for protecting his electrical equipment from the weather and from possible mechanical damage.

All portable electrical equipment (including generators) shall be inspected, tested and tagged by a competent and appropriately qualified electrician on a monthly basis. Details of these inspections and tests shall be recorded in a register which shall be made available to the Transnet Contract Manager for inspection.

The inspection and testing shall include a continuity test of the grounding (earthing) conductor (as applicable) and a complete examination of the equipment or system to assure safe use.

A colour coding system shall be used for the tagging of all electrical equipment.

The tag placed on a piece of equipment shall be traceable to an entry in a register where the following information concerning the inspection and testing of that piece of equipment shall be recorded:

- Date of inspection and testing;
- Equipment description;
- Equipment owner;
- Equipment location;
- Name, signature and licence number of the electrician who carried out the inspection and testing; and
- Comments concerning the inspection and testing, and details of any repair work carried out or required.

Any item of electrical equipment that does not pass an inspection or test shall be removed from service (and tagged, "Out of Service") immediately and shall then either be repaired (if possible) or removed from site.
Any item of electrical equipment without a tag or with an out-of-date inspection or test may not be used.

Any item of electrical equipment found without a tag or with an out-of-date inspection or test shall be removed from service until it has been inspected and tested. If it is found that more than one item of equipment being used by a contractor has not been inspected and tested as required, all work with electrical equipment shall be stopped until it can be demonstrated to the satisfaction of the Transnet Contract Manager that the contractor's systems and controls are adequate and fully implemented.

In addition to the formal monthly inspections and testing carried out by an electrician, electrical equipment (particularly extension cords, portable hand tools, welding machines, compressors and pumps) shall be visually inspected by the user on a daily basis prior to use. Users shall be trained to look for cracks in casings, loose casings, outer cord sheathing that is not being held firmly in position at the equipment, cuts or cracks in cord or cable insulation, exposed conductors, damaged plugs or sockets, and missing covers. Damage and / or defects shall be reported immediately.

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Personnel shall immediately stop using and report any electrical equipment or machinery that is shocking, sparking, overheating or smoking. Corroded outlets, switches and junction boxes shall also be reported.

16.14 Confined Spaces

The contractor shall comply to the requirements of General Safety Regulation 5 with regard to confined space entry and working inside confined spaces. This includes working inside tunnels.

Entry into a confined space occurs when a person's whole body, upper body or head is within the confined space. This is not intended to prevent an authorised, competent person from inserting only his arm into the space to test for hazards using appropriate monitoring equipment. Precautions shall be taken to prevent persons from being overcome by atmosphere escaping from the confined space.

Before any person enters a confined space, a detailed risk assessment shall be carried out, including the need for an authorised person to assess such things as oxygen levels, contaminants, temperature extremes and concentration of flammable substances.

As a minimum the risk assessment shall address the following:

- Isolation and lockout procedures required for chemical substances, mechanical or electrical energy, steam, pressure, heat, gases, liquids and solids;
- Venting, purging, draining and cleaning prior to entering the confined space;
- Hazards created by carrying out particular tasks or through the use of chemical substances in the confined space. Task-Based (or Issue-Based) Risk Assessments and/or Written Safe Work Procedures shall be available for work in confined spaces - in particular for abrasive blasting, welding, flame cutting, grinding, chemical/steam cleaning, rubber lining and painting;
- Entry, exit and escape routes as well as barricading;
- The electrical safety, intrinsic safety and other safety specifications of equipment to be used in the confined space (explosive atmospheres shall be considered);
- The need to test for presence of toxic/asphyxiant substances, radioactivity, oxygen, temperature extremes and flammable substances prior to entry and during the performance of work;
- Provision of suitable mechanical ventilation and personal protective equipment e.g. lifejackets etc. and in particular the use of respiratory protection such as compressed air breathing apparatus; and
- A ventilation rate suitable for general use shall take into account factors such as air contaminant type, rate of generation, rate of oxygen depletion, temperature, efficiency of ventilation distribution and contaminant removal from the breathing zone. Therefore each situation needs to be evaluated on its own merit by a risk assessment that will select a combination of ventilation method and respiratory protection that suits the particular circumstances. This shall be achieved by consultation between competent operations personnel, engineers and a ventilation specialist.
- Lighting

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Entry and work inside a permitted confined space shall be controlled and regulated by the project Isolation / Lockout and Permit to Work control systems. The Authorised Person issuing the Permit to Work may only do so if the conditions applying to the specific confined space entry have been satisfied and documented.

As a minimum, the following shall be included in the permitting process:

- Access barriers to prevent unauthorised entry;
- Isolation procedures for contaminants and other energy sources;
- The need for breathing apparatus / ventilation requirements;
- The sign-in and sign-out of all persons entering the confined space;
- Display of the permit;
- Communication procedures and/or equipment;
- Safety specifications of equipment to be taken into the confined space;
- Barricading of entrances and exits;
- Rescue plan and equipment;
- Standby person(s); and
- A completion and lock-in procedure (to ensure that space is evacuated and adequately secured).

The Permit to Work process shall require competent rescue persons with suitable communication, rescue and firefighting equipment to be present where any of the following may exist:

- Compressed air breathing apparatus is required;
- There is a high risk of fires or explosions;
- The atmosphere can rapidly become unsafe for breathing purposes if the mechanical ventilation fails;
- There is a high risk of flooding or engulfment;
- Narrow tunnels or pipes are entered or where exit or escape routes cannot readily be accessed
- Work is done in remote areas; and
- A single person, who cannot be observed directly or is isolated from other workers, does the work.

Where testing for toxic/asphyxiate substances, radioactivity, oxygen, temperature extremes and other health hazards as well as for flammable substances is carried out, it may only be done by persons trained, tested and certified competent in writing to do so.

The ventilation method and quantity shall be adequate to ensure oxygen levels and explosive or toxic gas levels remain within acceptable defined limits. Where ventilation is required, this shall be covered by an approved documented procedure.

As a minimum standard, the volume of air pumped in and circulated in a confined space needs to be equivalent to 20 times the volume of the space per hour.

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Where breathing apparatus or respiratory equipment is required, the contractor's Health and Safety Officer shall be consulted with regard to the specification and selection of suitable equipment.
All persons required to use respiratory protection shall be medically fit and trained in the correct use of the equipment.

Safe and convenient entry, exit and escape routes from the confined space shall be provided where possible and practical. Where this cannot be achieved effectively, the risk assessment shall determine if a competent rescue person shall be on duty at the confined space when work is in progress.

Where a standby/rescue person is required, they will have no other duties and will be positioned outside the confined space entry point at all times while personnel are within the space.

16.15 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., shall be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools shall be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools shall not be used for hoisting or lowering of the tool.

Loose clothing, jewellery or gloves that could get caught in the tool shall not be worn when operating powered tools. Operators of powered tools who have long hair shall keep their hair tied up.

The power source shall be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

16.16 Pneumatically Powered Tools and Equipment

Pneumatic powered tools shall only be driven by filtered compressed air with an in-line lubrication system or be lubricated prior to use if there is no in-line lubrication system. When using pneumatic powered tools the designated tool pressure shall be attained by the use of a regulator.

Pneumatic powered tools shall be disconnected when not in use. They shall not be disconnected from the air supply until all the residual pressure has been released or contained by a shut-off device. Hoses shall not be kinked as a means of containment.

Employees operating pneumatic powered tools, and any potentially affected employee in the vicinity of use, shall wear suitable personal protective equipment.

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All rotary compressed air tools (e.g. drills) shall have the rated revolution per minute (RPM) permanently marked on the casing. Only attachments of compatible RPM shall be used with these machines.

The actual RPM of the tool shall be checked every three months to ensure that the speed is as rated to manufacture specifications.

Pneumatic powered tools shall be secured to the air supply hose by an approved positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 kPa pressure at the tool, shall have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.

Compressed air shall not be used for cleaning purposes except where reduced to less than 30 kPa, and then only with effective chip guarding and personal protective equipment in place. The 30 kPa requirement does not apply to concrete form, mill scale and similar cleaning purposes. Compressed air shall not be pointed at any part of the body or used for cleaning clothing.

Airless spray guns of the type which atomize paints and fluids at high pressures shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection shall be provided in lieu of the above.

Abrasive cleaning nozzles shall be equipped with an operating valve, which shall be held open manually to enable operation. A support shall be provided on which the nozzle may be mounted when it is not in use.

16.17 Hydraulically Powered Tools and Equipment

Hydraulic powered tools shall use only approved fluid that retains its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's stated safe operating pressures for hoses, valves, pipes, filters and fittings shall not be exceeded.
Only manufacturer approved hoses, valves, pipes, filters and fittings shall be used.

16.18 Hand Tools

Employees required to use hand tools shall receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment shall be worn when using hand tools.

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Wrenches, including adjustable, pipe, end, and socket wrenches, shall not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins, wedges and chisels, shall be kept free of mushroomed heads. The wooden handles of tools shall be kept free of splinters or cracks.

Adjustable wrenches shall not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the Transnet Contract Manager. Wherever possible, ring spanners shall be used in preference to open end spanners.

Correct hand tools for the job shall be used, e.g. screwdrivers shall not be used as chisels, and pliers shall not be used as hammers.

All wedges and drifts that may spring, fly or fall to lower levels upon impact shall be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

All hand tools used in elevated areas, that may be dropped or fall to lower levels shall be fitted with safety lanyards and attached to solid structures or in the case of podges, scaffold keys etc., attached by wrist lanyard to the user.

Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the Transnet Contract Manager.

16.18.1 Stanley Knives / Utility Knives

A utility knife shall be used as a last resort, when it is the safest tool to use. Always consider alternatives that pose less of a risk to the operator.

Whenever a utility knife is used, ensure that a complete risk assessment is done and that all possible hazards have been addressed.

Only utility knives with retractable blades are to be used. The blade is to be retracted at all times when the knife is not in use or is being stored.

Before using the utility knife, ensure that the tool is in a good condition and the blade is secure in the holder (seated correctly and that there is no play). Ensure that the blade is always sharp and in good condition. This will prevent the use of excessive force.

Always wear cut resistant gloves and safety glasses when using a utility knife. There is always a risk of the blade breaking under tension and becoming a projectile.
Always ensure that you cut away from your body, and that no part of your body is in the firing line.
Always ensure cleanliness of all equipment in use during the cutting operations.

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16.19 Inspection of Equipment and Tools

All tools shall be inspected by the user before, during and after use. If any faults are identified, the tool shall be taken out of service and not used until repaired. Faulty tools that are not able to be repaired shall be tagged "out of service" and removed from site.

16.20 Manual Handling and Vibration

Any handling or lifting task that can only be done manually shall be planned and rehearsed before the task is done.

If more than one person is involved in a task a communication procedure shall be agreed in advance. Lowering the load shall be done in a controlled manner. Dropping a load is dangerous and shall be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load shall be mitigated to assure minimal potential for any injury. When mechanical lifting aids are provided, they should be used. Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance. Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

Risk Assessment with regards Manual Handling shall be conducted and also take into consideration the task factors, physical demands and tools involved in the task.

As far as possible, exposure to vibration shall be eliminated. However, if this is not possible, short-term solutions to decrease exposure include:

- Reducing the vibration levels;
- Removing the person from the vibrating equipment / tools;
- Reducing the period of time that the person works with the vibrating equipment / tools (at least 40 minutes break after 20 minutes working with a machine that vibrates excessively).

In order to reduce exposure to vibration:

- Consider buying equipment that operates effectively at lower speeds;
- Buy equipment with built-in damping materials;
- Buy lighter tools if they are available - they require less of a grip;
- Maintain the equipment;
- Make sure equipment is balanced and there are no worn parts;
- Use remote controls when they are available;

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- Reduce your grip on the equipment when it is safe. The less time you actually have your hands on the equipment the better. Relax your hands during these brief breaks;
- Take scheduled breaks; and
- Do other tasks that allow you to move away from vibrating tools and equipment.

The workplace shall be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

Quantitative evaluations of vibration produced by specific equipment shall include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

Employees and contractors shall be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.

Workplace vibration sources that could contribute to the exceedance of an Occupational Exposure Limit (hence potential for impact on worker musculo-skeletal fitness) shall be identified and adequately characterised.

Manual handling tasks assessed as having the potential to cause a Lost Time Injury (i.e. with potential for impact on worker musculo-skeletal fitness) shall be identified and adequately characterised.
Workplace manual / materials handling tasks risk rated as "significant" shall be assessed and recorded to include biomechanical factors (e.g. posture, bending, twisting, repetitive motions, working overhead, and exerting force away from the body).

16.21 Personal Protective Equipment

PPE requirements for a particular job or for a particular area shall be determined through a risk assessment for that job or area. Each contractor shall provide each of his employees with all required PPE (at no cost to the employee). The specific PPE that is provided to a particular employee shall be based on the nature of that employee's work and the location in which the work is performed (i.e. shall be based on the hazards to which the employee is exposed).All applicable legislation concerning Personal Protective Equipment (PPE) shall be complied with at all times.

As a minimum, the following PPE shall be worn by all persons (including visitors) at all times whilst on site:

- Safety footwear with steel toe protection;
- Safety helmet (hard hat); and
- High visibility protective clothing with reflective taping (long trousers and long-sleeved shirts with collars and cuffs).
- Additional PPE requirements shall be determined through hazard identification and risk assessment. This hazard-specific PPE (such as hand protection, hearing protection, hard hat, safety goggles, safety glass, face shield and respiratory protection) shall be worn

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as required (e.g. when in a certain area, when performing a certain task, or when working with a certain substance);
- The correct PPE shall always be worn:
- In accordance with site requirements (as indicated at the entrances to a site and at the entrances to buildings and / or designated areas on the premises);
- In zoned areas (e.g. noise zones and respirator zones); or
- As required by a Safe Work Procedure, or a Material Safety Data Sheet (MSDS).

Any employee who refuses to wear PPE or does not have all of the required PPE to perform his duties safely, will not be permitted to work.

Each employee shall care for his PPE, maintain it in good condition, and inspect it on a daily basis. If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it shall be replaced by the contractor.

PPE shall be stored in accordance with the manufacturer's requirements and / or recommendations.

Each employee shall receive training in the use, maintenance and limitations of the PPE that is provided to him and shall be made aware of why the PPE is necessary as well as the consequences of not wearing it as instructed (i.e. the potential for injury and / or disciplinary action). Training records shall be retained.

Symbolic signs indicating mandatory PPE requirements shall be prominently displayed at the entrances to the work site and at the entrances to buildings and / or designated areas on the premises where additional PPE is required. These signs shall comply with the applicable national standard (if one exists).

Each contractor shall appoint an employee to control the issuing and replacement of PPE, keep an up-to-date register as proof of PPE issued (an employee shall sign for the items that he receives, maintain PPE stock levels on site and carry out regular inspections to ensure that PPE is being used correctly and maintained in a good, serviceable and hygienic state, and is not being shared between employees.

16.21.1 Head Protection

A safety helmet (or hard hat) worn correctly will help protect the head in the event of:
- An employee being struck on the head by a falling or flying object; • An employee striking his head against a fixed or protruding object; or
- Accidental head contact being made with an electrical hazard.

A safety helmet shall be worn in accordance with the manufacturer's requirements. A safety helmet shall be worn directly on the head. The wearing of a cap or other headgear beneath a safety helmet is prohibited unless the items have been specifically designed to be used in combination (i.e. the arrangement is approved by the safety helmet manufacturer).

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The suspension system inside a safety helmet (that acts as a shock absorber) may not be removed.

The painting of safety helmets is prohibited.

Safety helmets may only be cleaned using a mild detergent and water. No solvents may be used.

16.21.2 Eye Protection

If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear shall be worn at all times (i.e. safety glasses, safety goggles, a face shield, a welding helmet, or a combination of these).

Such activities include:

- Working with rotating equipment (e.g. grinders, drills, mills, lathes, and saws);
- Welding and cutting;
- Chipping, chiselling or caulking;
- Using explosive powered tools;
- Abrasive blasting;
- Sanding; and
- Working with chemical substances (e.g. drilling fluids, acids, solvents, paints, pesticides, etc.).

For certain activities, special eye protection is required (e.g. a heat-resistant face shield is required when working near molten metal).
Double eye protection is required for activities such as:

- Grinding, cutting, chipping, chasing and reaming (employees shall wear both a full face shield and safety glasses or goggles); and
- Arc welding (welders shall wear both safety glasses and a welding helmet).

16.21.3 Hearing Protection

Regulations concerning occupational exposure to noise and the use of hearing protection shall be complied with as a minimum. "Low noise" tools and machinery shall be used wherever possible to reduce noise levels.

Where noise cannot be reduced to an acceptable level through engineering and work practice controls, measures shall be put in place to minimise the exposure of employees to the noise (i.e. administrative controls and personal hearing protection).

Areas where it is likely that the 95% upper confidence limit of an eight hour L_{eq} mean exceeds 85dB(A), or areas where impulse noise exceeds 140dB(C), shall be designated as noise zones. These noise zones shall be clearly demarcated and

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mapped, signs shall be posted, and all employees shall be made aware of the requirements for working in such an area.

Suitable hearing protection shall be worn in all designated noise zones and when carrying out (or working in the vicinity of) any activity where the noise level exceeds 85dB(A).

Where hearing protection is required, a hearing conservation programme (applicable to all personnel and visitors) shall be implemented. The programme shall include training in the correct use and proper storage of hearing protection devices as well as replacement requirements. Training shall be provided when hearing protection is first issued to an employee and refresher training shall be carried out at least annually thereafter. Training records shall be retained.

At least two types of personal hearing protection shall be made available to employees. The hearing protection devices provided shall have adequate noise reduction ratings (i.e. shall be able to attenuate the noise level to below 85dB(A)).

Personal hearing protection shall be issued on an individual basis and shall not be shared. In addition to personally issued hearing protection, suitable disposable hearing protection shall be made available at the entrances to all noise zones.

All Hearing Protection Devices (except for disposable hearing protection) shall be properly inspected and cleaned on a regular basis.

16.21.4 Respiratory Protection

Designated areas (respirator zones) shall be established where:

- It is likely that the 95% upper confidence limit of a Similar Exposure Group's mean exposure concentration exceeds the relevant Occupational Exposure Limit (OEL) for agents resulting in chronic effects, such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials; or
- The concentration of an agent (particulate, vapour or gas) with an acute effect exceeds 50% of the relevant OEL.

Note: For a particular hazardous agent, the OEL to be adopted shall be either the client's OEL or the OEL specified in legislation, whichever is the most stringent.

These areas shall be clearly demarcated and mapped, signs shall be posted, and all employees shall be made aware of the requirements for working in such an area.

Suitable Respiratory Protection Devices (RPDs) shall be worn in all designated respirator zones and when carrying out (or working in the vicinity of) any activity where the risk assessment has identified the need for respiratory protection.

Compatibility with the work tasks and other PPE, comfort (as it affects wear-time), and the ability to communicate adequately, shall also be considered.

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The risk assessment and method statement for the work to be performed, the information contained in the relevant Material Safety Data Sheets (MSDSs), and the results of any air monitoring associated with the substances to be worked with or activities to be carried out, shall be used to ensure that the most suitable RPD is selected.

Only RPDs certified to a recognised standard and approved by the Transnet Contract Manager may be used.

Where respiratory protection is required, a respiratory protection programme (applicable to all personnel and visitors) shall be implemented.

The respiratory protection programme shall include:

- Periodic inspection of RPDs, including before each use;
- Periodic evaluation (by competent persons) of cleaning, sanitising, maintenance and storage practices;
- Performance of positive pressure and negative pressure fit checks by RPD wearers before each use to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years (the training shall cover fit testing, use, cleaning, maintenance, filter cartridge replacement, and storage). Training records shall be retained.

RPDs shall be used, maintained, and stored in compliance with the manufacturer's requirements as well as the respiratory protection programme.

Suitable facilities shall be provided for the cleaning and sanitary storage of RPD's.

As a minimum, qualitative and documented fit testing shall be carried out (although quantitative fit testing is preferred) to ensure that the use of negative pressure RPDs (including disposable RPDs) is effective. Fit testing shall be performed by a competent person when an RPD is first issued and shall be repeated periodically in accordance with legal requirements or every two years as a minimum. A policy shall be in place requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks (otherwise a positive pressure RPD shall be used). A medical evaluation including a pulmonary function test may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPDs, breathing air shall be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The supplied air shall be tested to determine if the air quality complies with the requirements of applicable standards for breathing air.

For nuisance dust, dust masks with a protection level of at least FFP2 shall be worn.

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16.21.5 Hand and Arm Protection

Gloves shall be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness.

Suitable gloves shall be selected based on the task to be performed and the specific hazard against which the employee requires protection, such as:

- Sharp edges;
- Sharp points and splinters;
- Abrasive surfaces;
- Hazardous chemical substances (toxic, corrosive, sensitising, etc.);
- Extreme temperatures; and • Viruses, bacteria and parasites.

16.21.6 Foot Protection

Safety boots shall be worn at all times whilst on site, with the exception of offices and office or administration buildings in which closed athletic, business or similar shoes may be worn. Sandals, slops, slippers, open-toed and high-heeled shoes are not permitted on any work premises.

Safety boots shall provide the following protection:

- Steel toe cap to protect against crushing (impact and compression forces);
- Leather uppers that provide resistance against water penetration and water absorption;
- Slip resistant soles;

And where a risk assessment identifies the need:

- Puncture resistant soles (i.e. steel midsoles) for protection against sharp objects;
- Chemical resistant soles for protection against spilt chemical substances (such as solvents, hydrocarbons, acids, and alkalis);
- Heat resistant soles for protection against hot surfaces or molten metal; or
- Electrical shock resistant soles for protection (insulation) against live electrical conductors.
- Gumboots with steel toe caps shall be worn when working in water or very wet conditions.

16.21.7 Clothing

All employees working on a work site shall wear high visibility protective clothing with reflective taping. Trousers shall be long and shirts shall be long-sleeved. Shirts shall be buttoned at the neck and wrists.

Protective clothing shall preferably be made of natural fibres.

Short pants, short-sleeved shirts, sleeveless shirts, and vests are prohibited as outer garments (with the exception of a high visibility vest worn over a long-sleeved shirt). Loose clothing may not be worn where it may become caught in moving machinery or equipment.

For hot work (e.g. welding, cutting, etc.), work in the vicinity of molten metal, and any work carried out in the vicinity of an open flame, the protective clothing worn (shirt

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and trousers) shall be made of a suitable fire retardant fabric. Underwear and socks shall be made of natural fibres (preferably wool) or fire retardant fabric.

No employee may tuck his trousers into his boots when working in the vicinity of molten metal.

16.21.8 Body Protection

Suitable body protection shall be provided as required to protect employees against specific hazards. A range of work activities require body protection in one form or another, including but not limited to:

- Working in extremes of temperature, such as firefighting, attending to a heating furnace, working with molten metal, working in refrigerated environments, etc.;
- Hot work (e.g. welding, burning, cutting and grinding);
- Working with hazardous chemical substances (e.g. acids, solvents, pesticides, etc.); and
- Clean up and disposal of hazardous materials and wastes (e.g. asbestos, hydrocarbons, etc.).

A wide variety of protective garments are available, such as firefighting suits, furnace suits, freezer jackets, leather aprons, leather spats, laboratory coats, chemical resistant aprons, chemical resistant (or hazmat) suits, and disposable coveralls.

16.21.9 Electrical Protective Equipment

To reduce the risk of electric shock, electrical insulating equipment appropriate for the voltage that may be encountered shall be worn when working on energised electrical installations and when working within two metres of exposed energised conductors.

All rubber electrical insulating equipment (including gloves, sleeves, matting, covers, blankets, and line hoses) shall be inspected for damage prior to and after each use, and immediately following any incident that can reasonably be suspected of having caused damage.

Rubber insulating equipment with defects and / or damage may not be used.

Rubber insulating gloves shall be electrically tested before first issue and every 12 months thereafter as a minimum. Insulating gloves shall also be given an air test along with the daily inspection. Essentially, this involves filling a glove with air and checking for any holes or leakage.

Insulating equipment that fails an inspection or electrical test may be repaired only as follows:

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- Rubber insulating line hose may be used in shorter lengths with the defective portion(s) cut off;
- A rubber insulating blanket may be repaired using a compatible patch that results in the patched area having electrical and physical properties equal to those of the blanket;
- A rubber insulating blanket may be salvaged by cutting the defective area off the undamaged portion of the blanket;
- Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by applying compatible patches. The patched areas shall have electrical and physical properties equal to those of the surrounding material.

Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.

Repaired insulating equipment shall be retested before it is put back into use.
Insulating equipment shall be cleaned as required to remove foreign substances (using a mild detergent).

Insulating equipment shall be stored in such a location and in such a manner so as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

Leather protective gloves shall be worn over rubber insulating gloves to provide mechanical protection against cuts, abrasions, and punctures.

Suitable arc flash PPE (e.g. voltage rated gloves, fire retardant clothing, arc rated face shield, arc flash hood, arc flash suit, etc.) shall be worn whenever an employee is potentially exposed to an arc flash hazard. The appropriate level of PPE shall be worn depending on the task and the potential energy exposure. These PPE requirements shall be clearly specified as part of arc flash protection programme (refer to the Electrical Safety Standard).

16.21.10 Jewellery

Necklaces, dangling earrings, and bracelets may not be worn on a work site. No ring or watch may be worn where there is a risk that it may become caught in machinery or equipment. No jewellery or other conductive apparel (such as a key chain or watch) may be worn when carrying out energised electrical work.

16.21.11 Hair

Scalp hair that is longer than the top of the shoulders shall be tied up and restrained within the person's safety helmet or within the collar of his or her overalls, shirt or jacket.

For negative or neutral pressure Respiratory Protection Devices, facial hair shall not cause the seal between the respirator and facial skin to be broken (or prevent a seal from being formed in the first place).

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16.21.12 Task-Specific PPE

In addition to the standard PPE required for a work site (including a safety helmet, safety glasses, safety boots, and high visibility protective clothing), the following task-specific PPE shall be used as a minimum by any person carrying out or assisting with such a task:

Grinding – safety glasses or goggles and full face shield (i.e. double eye protection), hearing protection, respiratory protection where dust or fumes may be generated, leather gloves, leather apron, and leather spats;

- Spray Painting – respiratory protection (air-supplied hood for confined spaces), safety goggles (if the respirator design does not provide this protection), hearing protection (where air compressors are used), chemical resistant gloves, and chemical resistant disposable coveralls.

16.22 Sun Protection

The contractor shall ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, brims, helmets and UV factored sunscreen. Shade structures shall also be made available to all employees.

The contractor shall conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

16.23 Fuel / Flammable Liquid Storage and Refuelling

No fuel (diesel, petrol, paraffin, etc.) or any other flammable liquid (paints, solvents, etc.) may be stored on site unless approved in writing by the Transnet Contract Manager.

If the on-site storage of a fuel or a flammable liquid is approved, the contractor shall ensure the following:

- The quantity of fuel / flammable liquid to be stored on site shall be kept to the minimum that is required;
- The storage area shall be located in a well ventilated area at least 10 metres away from any building, drain, boundary or any combustible material;
- If more than 200 litres of fuel / flammable liquid is to be stored, the tank shall be installed / the containers shall be positioned within a bund (see Definitions);
- If the fuel / flammable liquid are to be stored in bulk tanks / vessels, then the minimum capacity of the bund shall be 110% of the volume of the largest tank / vessel. If many small containers (e.g. 210 litre drums) are to be stored, the bund shall be able to contain 25% of the total volume of the stored products;
- The bund shall be impermeable. It shall have a solid concrete floor and the walls shall be constructed out of brick and shall be plastered on the inside;
- The bund shall be fitted with a lockable drain valve (for draining away rainwater), which shall remain locked in the closed position. The valve may only be opened under supervision and in accordance with a written procedure;

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- The fuel / flammable liquid storage area may not be used for the storage of any other materials / equipment, and shall be kept completely free of all combustible materials
  (including rubbish, brush and long grass) at all times;
- Access to the storage area shall be controlled (wire mesh fencing and gate);
- Appropriate warning signage (i.e. "Flammable Liquid", "No Smoking" and "No Naked Flames") shall be prominently displayed at the storage area. The contents and volume of each tank shall be indicated;
- In order to contain spillages, the offloading / refuelling bay at the fuel / flammable liquid storage area shall have a solid concrete base surrounded by bund walls, ramps or humps and / or spill trenches (covered with steel grating) that lead into a sump;
- Fuel dispensing pumps shall be protected against impact damage;
  All fuel / flammable liquid storage tanks and dispensing equipment shall be electrically bonded and properly earthed;
- All electrical installations and fittings shall be of an approved intrinsically safe type;
- Two 9kg dry chemical powder fire extinguishers shall be mounted in an easily accessible position near the entrance gate to the fuel / flammable liquid storage area. Depending on the size of the storage area, additional fire extinguishers may be required to ensure that an extinguisher is no further than 15 metres away from any point on the perimeter of the storage area;
- A fire extinguisher shall be at hand wherever refuelling is carried out;
- Smoking or open flames within 10 metres of a fuel / flammable liquid storage / refuelling area is strictly prohibited;
- No petrol- or diesel-powered vehicle or equipment may be refuelled while the engine / motor is running;
- Cellular phones shall be switched off in fuel / flammable liquid storage / refuelling areas;
- Spill clean-up kits (containing a suitable absorbent fibre product) shall be provided;
- Any spillages shall be cleaned up immediately and all contaminated cleaning materials shall be disposed of in accordance with the applicable legislation;
- If a flammable liquid is spilt or is leaking from a container / vessel, the area shall be cordoned off and appropriate warning signage shall be displayed to keep unauthorised personnel away from the affected area. Every effort shall be made to contain the spillage. All hot work in the vicinity shall be stopped immediately. If the spilt product is volatile and the possibility exists that a vapour cloud may form, or if the leak or spillage cannot be contained or stopped, then appropriate emergency response procedures shall be activated (refer to Section 14) including the evacuation of all persons in the vicinity. Suitable firefighting equipment shall be positioned ready for use should the spilt product ignite;
- The manual decanting of fuel or a flammable liquid from a large container should only be done using a stirrup pump (or similar) or a purpose-made frame which allows the container / drum to tilt for decanting and then return to the upright position;

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- Drip trays shall be used wherever required;
- All tanks, drums, cans, etc. containing flammable liquids shall be tightly closed and properly sealed except for when a container is being filled or when a product is being decanted;
- The transport or storage of corrosive or flammable liquids in open containers is strictly prohibited
- Daily-use quantities of fuel (up to a maximum of 20 litres) shall be handled in an approved safety can with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire;
- Where safety cans may be impracticable, only approved metal containers with screw caps may be used. Each container shall be clearly labelled to indicate its contents;
- Only small quantities of flammable liquids (paints, solvents, etc.) may be stored within a building. Each product shall be kept either in its original container or in an approved container which shall be properly sealed. Each container shall be clearly labelled to indicate its contents. When not in use, all such containers shall be stored in a well-ventilated steel cabinet which shall be kept locked to prevent unauthorised access;
- Not even small quantities of flammable liquids may be stored or dispensed in buildings or places of public assembly, in general warehouses, or in buildings containing sources

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of ignition such as space heaters, cooking devices, open electric motors, motor vehicles, or where welding, cutting, or grinding activities are being carried out;
- Safe Work Procedures shall be compiled for the transportation (including delivery), offloading, storage, handling and use of any fuel / flammable liquid on site;
- All personnel that will be required to work with or may come into contact with a flammable liquid shall be made aware of the hazards associated with the product and shall be thoroughly trained in the safe transportation, use, handling and storage thereof.

16.24 Fire Protection and Prevention

The contractor shall compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The contractor shall assess / survey his area of responsibility and identify locations where the risk of fire is high. Cognisance shall be taken of the fact that certain locations may need to be designated as high risk due to the presence of large quantities of flammable or combustible materials / substances. For all high risk areas, the contractor shall ensure that additional precautions are taken to prevent fires and strict control is exercised over any hot work (i.e. welding, cutting, grinding, etc.) that is carried out.

The contractor shall supply and maintain all required firefighting equipment. The type, capacity, positioning, and number of firefighting appliances shall be to the satisfaction of the Transnet Contract Manager and shall meet the requirements of the applicable legislation. Fire mains, hydrants and hose reels will rarely be available on site, so use shall primarily be made of portable fire extinguishers.

Firefighting equipment, fixed and portable, shall be strategically located with a view to being able to rapidly deploy the equipment in order to bring potentially dangerous and destructive fires under control while still in their infancy.

All fire extinguishers (and any other firefighting equipment) placed on site shall be:
- Conspicuously numbered;
- Recorded in a register;
- Visually inspected by a competent person on a monthly basis (the results of each inspection shall be recorded in the register and the competent person shall sign off on the entries made); and
- Inspected and serviced by an accredited service provider every six months (the Transnet Contract Manager may require that this frequency be increased depending on the environmental conditions (e.g. high dust levels, water, heat, etc.) to which the fire extinguishers are exposed).

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage shall be sent to an accredited service provider for repair and / or recharging. Details shall be recorded in the register.

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Firefighting equipment may not be used for any purpose other than fighting fires. Disciplinary action shall be taken against any person who misuses or wilfully damages any firefighting equipment.

Access to firefighting equipment, fixed or portable, shall be kept unobstructed at all times.

Approved signage shall be in place to clearly indicate the location of each permanently mounted fire extinguisher, fire hose reel, etc.

The contractor shall ensure that all persons working in / entering his area of responsibility are made aware of where all firefighting appliances and alarm points are located.

The contractor shall ensure that his employees (and those of any appointed subcontractors) are trained in firefighting procedures and the use of firefighting equipment.

The contractor shall compile an emergency response procedure detailing the actions that shall be taken in the event of a fire or a fire / evacuation alarm (see Section 14). All personnel working within the contractor's area of responsibility shall be trained, and all visitors shall be instructed, on this procedure. Copies of the procedure shall be prominently displayed in the workplace in all languages commonly used on the site.

A person discovering a fire shall extinguish the fire if he can do so safely, and then immediately report the incident to his supervisor. If the person cannot extinguish the fire, he shall raise the nearest alarm and then report the fire as quickly as possible to his supervisor, the person responsible for the area, and / or Security.

On hearing a fire / evacuation alarm, all persons shall make any operational plant or equipment safe, and then proceed to the nearest emergency assembly point and await instructions.

All incidents of fire (including the use or misuse of any firefighting equipment) shall be reported to the Transnet Contract Manager immediately. Used fire extinguishers shall be replaced by the contractor without delay.

No hot work (i.e. welding, cutting, grinding, etc.) or any other activity that could give rise to a fire may be performed outside of a designated workshop without a Permit to Work having been issued.

Wherever hot work is being carried out, a fire extinguisher shall be at hand. Where the risk assessment determents that it is necessary, a fire watch shall be stationed.

Supervisors shall carry out workplace inspections regularly to ensure adherence to fire prevention measures and procedures.

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At the end of every working period (i.e. before each tea / lunch break and at the end of every shift / day), the workplace shall be thoroughly inspected to ensure that no material is left smouldering and no condition / situation exists that could give rise to a fire.

The contractor shall ensure that all supervisors and all employees carrying out or assisting with any hot work or any other activity that could give rise to a fire have been trained in firefighting procedures and the use of firefighting equipment. The training shall be conducted by an accredited training provider.

When using electrical equipment, all cables shall be in good condition and the nearest convenient socket shall be used.

No power socket may be loaded beyond its rated capacity through the use of adaptors, etc.

Makeshift electrical connections are not permitted under any circumstances.

Water-based firefighting equipment shall not be used on electrical equipment or burning liquids.
Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine shall be fitted with a permanently mounted fire extinguisher.

Smoking is only permitted in designated smoking areas. Cigarette ends / butts shall be properly stubbed out in the ashtrays provided and never thrown into waste bins.

The contractor shall ensure that good housekeeping practices are enforced, as this is crucial to the prevention of fires.

All combustible waste materials shall be removed from the workplace on a daily basis (at the end of each shift) and placed in waste receptacles located at least 5 metres away from any structure.

The accumulation of waste materials in out-of-the-way places is prohibited. Offices, desks, cabinets, etc. shall always be kept tidy and uncluttered. Waste paper bins shall be emptied regularly.

The storage of combustible materials under stairways or in attics is prohibited. The storage of any materials against the exterior of a building or any other structure is prohibited.

All walkways, passages and stairways shall be kept clear (i.e. shall be unobstructed) at all times, as they may need to be used as a means of escape. The areas around and the routes to all exits, fire escape doors, fire hydrants, fire hose reels and fire extinguishers shall be kept clear (i.e. shall be unobstructed) at all times.

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"No Smoking" signs shall be conspicuously displayed in and around all storage areas / rooms.

Waste may not be burned under any circumstances.

No flammable liquid (such as petrol, acetone, alcohol, benzene, etc.) may be used for starting fires or as a solvent for cleaning clothes, tools, equipment, etc. Only solvents approved by the Transnet Contract Manager may be used for cleaning purposes.

Whenever any work is carried out involving the use of a flammable substance / material, the area shall be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") shall be displayed.

16.25 Smoking

The contractor shall not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area shall be clearly demarcated and the required signage shall be displayed.

Any person found smoking or discarding a cigarette butt outside of a designated smoking area may be removed (temporarily or permanently) from site. In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) shall be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials shall not be emptied into rubbish bins or any other container holding combustible materials.

"No Smoking" signs shall be strictly observed.

16.26 Housekeeping

The contractor shall maintain all work areas in a tidy state, free of debris and rubbish. Unless directed otherwise, the contractor shall dispose of all debris, rubbish, spoil and hazardous waste off site in a designated and authorised area or facility. The contractor shall familiarise himself with the waste management plan for the site including collection and disposal arrangements and shall align his waste management activities accordingly.

In cases where an inadequate standard of housekeeping has developed and compromised safety and cleanliness, a Transnet Contract Manager may instruct the contractor to cease work until the area has been tidied up and made safe.

Neither additional costs nor contract deadline extensions will be allowed as a result of such a stoppage. Failure to comply will result in a clean-up being arranged through another service provider at the cost of the non-complying contractor.

The contractor shall carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The contractor shall document the results of

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each inspection. These records shall be maintained and shall be made available to the Transnet Contract Manager on request.

The contractor shall implement a housekeeping plan for the duration of the contract ensuring that the site housekeeping is maintained. Furthermore, at the end of every shift, the contractor shall ensure that all work areas are cleaned, all tools and equipment are properly stored, and construction rubble is removed.

Where the contractor fails to maintain housekeeping standards, the Transnet Contract Manager may instruct the contractor to appoint a dedicated housekeeping team at the contractor's expense.
Littering is prohibited.

16.27 Waste Management

Waste may not be disposed of unless the disposal of that waste is authorised by law. The contractor shall therefore ensure that all waste that is generated is handled, stored, transported and disposed of in accordance with the requirements of the applicable legislation / local authority.

No waste may be removed from the site to a waste storage or disposal facility unless that facility has been approved or licenced waste facility. Approved/licensed waste disposal service providers shall be used for any waste removed from site. These service providers shall be audited on a two-yearly basis (or more frequently if deemed necessary based on risk) in order to ensure compliance with legislation and to help ensure that no liabilities accrue to the contract.

An adequate number of waste bins and skips shall be provided by the contractor and suitable arrangements shall be made to ensure that these bins and skis are emptied regularly. Hazardous wastes shall be kept separate from general wastes.

16.28 Stacking and Storage

All irregular shaped items will be stacked at floor / ground level in designated stacking areas on a level, firm base capable of withstanding the weight of the commodities being stacked and stacked in such a manner that the items do not topple over or change position due to subsidence or weight transfer when being moved.

Where these commodities are stacked on shelves or racks, the shelves or racks shall be designed to carry the weight of the commodity being stacked.
All racks or shelves where heavy material or commodities are stacked will have a weight carrying limitation clearly marked on the structure and have a safety factor of at least +10% of maximum total carrying capacity.

All materials, commodities or articles, which could be damaged due to inclement weather, shall be stored under cover.

Waste material that is combustible shall not be allowed to accumulate in sufficient quantities to create a hazard.

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No commodities or equipment may be stacked or stored within 500mm of rolling stock tracks or where mobile equipment travels.

The storage of material, small equipment, tools, files and general items in cupboards and on shelves shall be neat and controlled at all times. Incompatible substances shall not be stored in or on the same cupboard or shelf.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

16.29 Demarcation

Temporary demarcation in the form of hazard tape (red and white) may be used to demarcate areas where there is, for relatively simple reasons, restricted access.

Where hazards exist and entry shall be specifically excluded for safety or health reasons, hazard tape in any form shall not be used in isolation. A robust and substantial barrier of timber, rope or other material shall be used in conjunction with barrier tape, to prevent entry to unauthorised persons.

Outside storage areas where it is impractical to use floor demarcation, demarcation may take the form of creosote poles and wire rope or similar. Spans between uprights should be painted yellow.

16.30 Facilities

The Contractor shall in addition to Facilities Regulations 2004, provide at or within reasonable access of every site, clean, hygienic and maintained facilities.

Sanitary conveniences shall be provided and maintained at a rate of at least one shower facility for every 15 workers, at least one sanitary facility for each sex and for every 30 workers, separate male and female changing facilities and sheltered eating areas. (Check SANS 10400 Part F).

Where chemical toilets are provided, one toilet for every twenty-five employees shall be allocated.

All toilets shall be cleaned daily, disinfected and provided with toilet paper. All employees making use of these facilities have the responsibility to help keep the facilities neat, clean and hygienic.

Washing facilities, including soap and towels, shall be made available for use by the contractor's employees.

Drainage from all washing / toilet facilities shall be properly designed and constructed to prevent employee exposure to wastewater (and the associated biological hazards). Wastewater may not accumulate or stand in pools at any location on the project site.

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Change rooms shall be provided and shall be kept clean and free from odours at all times.

No chemicals or equipment or items (other than those normally associated with for cleaning of these hygiene facilities) may be stored in the facilities.

All entrances shall be constructed in a way to afford privacy to users.

Drinking water shall be provided.

A sheltered (covered) area shall be set aside on site to be used as a dining facility (eating area). Adequate seating shall be provided for the maximum number of employees. The facility shall be kept clean and tidy. Food may only be consumed in authorised sheltered areas.

A suitably sized, impervious receptacle (bin) shall be provided for the disposal of waste food and other refuse generated at the dining facility. This bin shall be emptied and cleaned regularly (i.e. promptly after mealtimes).

Adequate storage shall be provided to the contractor's employees for the storage of food and drinks. Where fridges are provided, they shall not be overstocked and shall maintain sufficiently low temperatures.

16.31 Occupational Hygiene

The contractor shall ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.

- Noise;
- Thermal stress (heat and cold);
- Particulates (dust);
- Silica (free crystalline silica);
- Asbestos;
- Gases or vapours;
- Lead;
- Chemicals;
- Ionising radiation;
- Non-ionising radiation;
- Vibration (hand / arm vibration and whole body vibration); • Ergonomics; and
- Illumination.

A baseline survey shall be carried out by an Approved Inspection Authority: A plan for measuring and monitoring occupational exposure shall be developed by the contractor.

All monitoring results obtained shall be analysed on a regular basis to:

• Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);

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- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit shall be recorded, investigated and reported. Appropriate corrective actions shall be identified and implemented

16.32 Lighting

For all work areas and access ways, if the natural lighting available is inadequate it shall be supplemented by artificial lighting to meet the minimum levels required.

A lighting survey to determine luminance shall be conducted for all work areas, at least once every two years and prior to work commencing for the first time in any area.
Measurements do not need to be conducted by an Approved Inspection Authority for Occupational Hygiene

Emergency lighting shall be provided in all indoor workplaces that do have adequate natural lighting or in which persons work at night. The emergency sources of lighting that are provided shall be such that, when activated, an illuminance of not less than 0.3 lux is obtained at floor level, to enable employees to evacuate safely.

Where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance shall be not less than 20 lux.

Windows and translucent sheeting shall be kept adequately clean and clear of obstructions as far as reasonably practicable. Light fittings, i.e. lenses and reflectors shall be kept clean.

If a light intensity meter is used, a valid calibration certificate shall be available.

Neon lights shall not be installed in areas where moving parts of machinery or equipment cannot be fully guarded, i.e. lathes, bench grinders, etc. in order to eliminate the stroboscopic effect.

No person may use a portable electrical light where the operating voltage exceeds 50 volts, unless:

- It is fitted with a non-hydroscopic, non-conducting handle;
- All metal parts which may become live are protected against accidental contact; • The lamp is protected by means of a guard firmly attached to the handle; and
- The cable can withstand rough use.

No person may use a portable electric light in damp or wet conditions or in closely confined spaces, inside metal vessels or when in contact with large masses of metal,

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unless: • The lamp is connected to a source incorporating an earth leakage; and • The operating voltage of the lamp does not exceed 50 volts.

16.33 Hearing Conservation

A hearing conservation program shall be implemented and protection against the effects of noise exposure shall be provided when the noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-weighted scale of a standard sound level meter at slow response.

For the hearing conservation program to be effective it shall include as a minimum:

- Monitoring of the workplace to determine the representative exposure of employees to excessive noise levels;
- An audiometric testing program for employees, which shall include:
  - A baseline audiogram for all employees exposed to noise levels equal to or in excess of the standard;
  - Annual audiograms for each overexposed employee;
  - Analysis of audiogram results with retesting and/or referral to an otolaryngologist or qualified physician when a significant threshold shift (STS) occurs; and ◆ Written employee notification of the STS.
- A training program for all employees exposed to noise;
- Provision of personal protective equipment to all affected employees when administrative or engineering controls fail to reduce sound levels to within the levels of the standards.

Monitoring of employee exposures to noise shall be conducted by an Approved inspection Authority. The monitoring requirement may be met by either area monitoring or personal monitoring that is representative of employee exposures. Personal monitoring is preferred, and may be required based on the type(s) of noise sources.

For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with legislation.

A person-task specification shall be available for every job category and shall be submitted with an employee for audiometric testing.

Audiometric testing and an annual audiogram shall be conducted by a competent person and provided as part of the regular medical examinations. Audiometric test results obtained from the pre-employment medical examination for a new employee shall be used as the baseline audiogram. Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

Hearing protectors shall not be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise. Employees shall be notified of the need to avoid high levels of non-occupational noise exposure during this 14-hour period.

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Record-keeping for the audiogram shall include:

- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer;
- Employee's most recent noise exposure assessment.

Audiometric test results shall be maintained in the employee's medical file.

Personal protective equipment shall be provided and replaced as necessary at no cost to employees. Supervisors shall ensure that hearing protective devices are worn by all employees who are exposed to a time-weighted average of 85 decibels or greater and who have experienced a significant threshold shift. Employees shall be given the opportunity to select their hearing protectors from a variety of suitable protectors.

Noise zones shall be indicated my means of signs at every entrance to such zones. When noise levels exceed 100 dB(A), a combination of earplug and earmuff may be required to achieve protection of the worker. Hearing Protection Devices should be worn for the full noise exposure period.

16.34 Particulate and Gas / Vapour Exposures

The concentration of an HCS in the air is, or maybe, such that the exposure of employees working in that workplace exceeds the recommended limit without the wearing of respiratory protective equipment, is zoned as a respirator zone.

Designated areas shall be created where:

- It is likely that the 95 per cent upper confidence limit of a Specific Exposure Group's (SEG) mean exposure concentration for agents resulting in chronic effects (such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials) exceeds the relevant OEL; and
- Agents with an acute effect, such as particulate hazards, or gases (e.g. CO, SO2, NH3, HF, etc.), or vapours exceed 50 per cent of the relevant OEL.

Designated areas shall:

- Be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting, where necessary, shall use appropriate wording or symbols on signs to identify the hazard;
- Have a documented respiratory protection programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;
- Have regular monitoring of SEGs working in the area; and
- Have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

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Particulate and gas / vapour monitoring shall be appropriate to the exposure conditions and toxicants and based on the use of equipment approved by local regulatory authorities, as per documented methods.

Where risk assessment indicates the possible presence of levels of gas or vapour sufficient to cause health effects in less than one shift (e.g. confined space entry), continuous monitoring is required as long as the potential for harm exists.
Employees and contractors shall be covered by a medical surveillance programme when: • Their Specific Exposure Group TWA mean exposure to respirable crystalline silica, total inhalable dust, respirable dust, lead or asbestos is greater than 50 per cent of the relevant OEL;

- The medical adviser considers that it is advisable; or • There is a legal requirement for medical monitoring.

Where risk assessment indicates a risk of a respiratory condition, assessment programmes shall include chest x-rays and / or lung function tests. The test or tests chosen shall enable the earliest detection of adverse effects from the exposure of concern. Where indicated, they shall meet the following standards:

- High quality chest x-rays will be taken every five years, unless local legislation requires these to be more frequent;
- All chest x-rays for pneumoconiosis surveillance will be read to International Labour Organisation (ILO) standards by an ILO B reader, wherever possible, and if not, by a competent radiologist using verifiable quality criteria;
- Any progression of more than one step on the ILO extended scheme to a reading above 1/0 will be reviewed by a physician;
- Any reading suggesting active lung disease will be reviewed by a physician; and
- All spirometry will be performed by trained staff following the American Thoracic Society guidelines or equivalent and be offered at a frequency determined by the likely rate of detectable change in lung function.

Controls shall be of an adequate standard such that surfaces are adequately cleaned to avoid:

- Dust generation due to material dislodgment (e.g. windblown), where practicable; or • Fume generation from accumulated dust during welding / heating or cutting operations.

Where risk assessment indicates the need to reduce exposures to toxic substances for employees or their families, good personal hygiene shall be enforced. The programme shall include:

- No smoking, eating or drinking in designated hazard areas;
- Washing of hands and face prior to drinking, eating or smoking; • Showering at work post shift or after exposure to 'dirty' conditions; and
- Laundering of contaminated clothing by the contractor.

Abrasive blast cleaning shall be conducted so as to protect worker health and minimise dust emissions. Substitutes shall be used whenever practicable for abrasives

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containing crystalline silica. However, if such abrasives are used, workers shall be aware of the hazards and exposure monitoring conducted. The hazardous properties of alternative materials shall be considered before use.

Where required, training in the recognition of signs and symptoms of hazardous particulate and gas / vapour exposure, emergency procedures and preventative measures shall be provided.

16.34.1 Respiratory Protection Devices

The selection of Respiratory Protection Devices (RPD's) shall be based on:

- The potential particulate size distribution, gas / vapour types, substance toxicity and likely concentrations;
- Compatibility with the work tasks and other PPE; and
- Comfort (as it affects wear-time) and allowance for adequate communication.
- The type(s) of airborne contaminants that are present (gases, vapours, and particulates and aerosols including dusts, fumes, sprays, mists, and smoke);

Only RPD's approved by the Transnet Contract Manager may be used. Suitable facilities shall be available for cleaning and sanitary storage of RPD's.

Half-mask and full-face air-purifying respirators shall NOT be used where:

- The atmosphere is oxygen deficient (< 19.5 per cent);
- The atmosphere is immediately dangerous to life or health (e.g. in areas where CO concentrations are > 1500 ppm, HF > 30 ppm or NH4 > 300 ppm);
- Gases and vapours are more than ten times their OEL or greater than 1000 ppm for half-mask respirators, or more than 100 times their OEL for full-face respirators; or • Particulates are more than five times their OEL for half-mask respirators, or more than 50 times their OEL for full-face respirators.

For atmospheres that are oxygen deficient, or contain unknown hazards, or have concentrations of gases and vapours that are unknown or could potentially exceed levels that are immediately dangerous to life or health, an air-supplied type respirator shall be worn.

For effective use of negative pressure RPD's (including disposable RPD's), fit testing shall be qualitative and documented as a minimum, although quantitative fit testing is preferred. Fit testing shall be performed by a competent person when RPD's are first issued and shall be repeated periodically according to legal requirements or two-yearly as a minimum frequency. There shall be a policy requiring a clean-shaven face when using a negative or neutral pressure RPD for routine tasks, or the use of a positive pressure RPD will be required. A pulmonary function test and medical evaluation may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPD's, breathing air shall be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The

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quality of the breathing air shall be checked for conformance with applicable standards.

The respiratory protection programme shall include:

- Periodic inspection of RPD's, including before each use;
- Periodic evaluation of cleaning, sanitising, maintenance and storage practices by competent persons;
- Performance of positive and negative fit checks before each use by RPD wearers to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years.

16.34.2 Asbestos and Non-asbestos Fibrous Silicates

This section applies to asbestos and bio-persistent non-asbestos fibrous silicates that may display asbestos-like toxicity, related to fibre diameter and length. Local regulations shall be followed as a minimum. The following requirements shall be met:

- A management program shall be in place and actively pursued;
- No new products containing these materials may be purchased;
- Installed materials of this type shall be identified and assessed annually for current safety. Where 'safe in place', it should not be removed, unless there is an opportunity for removal during renovation or construction of buildings or equipment;
- Work areas shall be barricaded off and signposted to restrict entry; and
- Contaminated material shall be promptly placed in appropriate marked plastic disposal bags or covered containers for disposal to an approved landfill.

All workers exposed to these materials shall be on a register. "Exposed" means working on or near such material that has been disturbed, abraded or cut. The register shall contain details of their annual medical examination and the results of occupational hygiene monitoring.
Asbestos contractors shall be competent, registered and have adequate equipment, procedures and monitoring.

Where required, the asbestos / bio-persistent non-asbestos fibrous silicates management programme shall cover work practices, training, monitoring, medical surveillance, and waste handling and disposal.

Maintenance operations shall be made aware of potential cristobalite exposure hazards when disturbing non-asbestos fibrous silicates that have undergone high temperature conditions.

The potential for occurrence of naturally occurring asbestos materials in exploration or mining production activities shall be assessed, the risk of exposure determined and appropriate control measures implemented where required.

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16.35 Hazardous Chemical Substances

No chemical substance may be brought onto site unless it appears on the Chemical Substances Register which will be developed and kept by the contractor.
The register will contain the following information:

- Trade name / product name of substance;
- Manufacturer / supplier of substance;
- Maximum inventory;
- Storage requirements and precautions;
- Inventory of special emergency items held for handling spillages, fires, etc. (e.g. reagents to neutralise spillages, firefighting foam, etc.); and
- Approved disposal methods.

The contractor shall ensure that a Material Safety Data Sheet (MSDS) is obtained for each chemical substance brought onto site. A file, or files, containing all of the MSDS's shall be maintained and shall be readily available to all personnel on site (particularly first aiders) as well as other potentially affected parties (e.g. emergency services personnel, persons from the local community, etc.). The MSDS's shall be in the language(s) commonly used on site.

The contractor shall appoint a trained and competent Hazardous Chemical Substances Coordinator who understands and is able to evaluate the risks associated with a wide variety of substances. This person shall be responsible for:

- Assessing the hazardous properties and risks associated with all chemical substances brought onto site by the contractor and appointed sub-contractors (using the MSDS's);
- Determining precautions and safe practices for transportation, use, handling, storage and disposal (including PPE requirements) (using the MSDS's);
- Determining first aid and emergency response requirements / procedures (using the MSDS's);
- Maintaining the MSDS file;
- Managing and monitoring the consumption of inventory; and • Providing an "as needed" service to site personnel and suppliers.

The risks associated with the transportation, use, handling, storage and disposal of all hazardous chemical substances brought onto site shall be assessed and managed by the contractor through a process that incorporates risk reduction using the hierarchy of controls. The contractor shall provide Safe Work Procedures for the transportation, use, handling, storage and disposal of all hazardous chemical substances to be used on site.

Whenever a task-based risk assessment is carried out, consideration shall be given to the use of chemical substances (e.g. greases, solvents, etc.).

The contractor shall provide his employees with all of the Personal Protective Equipment that is necessary to prevent exposure / injury while handling / using the hazardous chemical substances that they will be required to work with. Appropriate

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PPE shall be selected with consideration given to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

The contractor's employees shall be trained in the safe transportation, use, handling, storage and disposal of the hazardous chemical substances that they will be required to work with or may come into contact with. The training shall specifically address PPE requirements (including the correct selection, fitment and use thereof).

All personnel shall be trained to understand the potential health effects associated with exposure to hazardous chemical substances and therefore the importance of Safe Work Procedures and PPE. All personnel shall be trained on emergency response procedures and first aid measures.

Behaviour-based observations and coaching shall include the use / handling of hazardous chemical substances.

An appropriate occupational exposure monitoring and medical surveillance programme shall be in place for all personnel potentially exposed to hazardous chemical substances which have the potential to cause immediate or long-term harm.

Emergency showers and eyewash stations shall be provided where required by law, or where a risk assessment indicates a need. The emergency showers and eyewash stations shall be appropriately located, signposted, and regularly tested and maintained. Employees shall receive training on the location and use of the showers / eyewash stations.

An emergency response plan for incidents involving hazardous chemical substances shall be in place. Regular and appropriately staged emergency drills (possibly involving external spill response and ambulance support services) shall be held and lessons learnt shall be incorporated into the emergency response plan.

The contractor shall provide appropriate storage facilities for all hazardous chemical substances to be used on site. The storage facilities shall be secure and protected from damage. They shall also be designed for easy access for firefighting purposes. Where applicable, the storage facility shall protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

The inventory of hazardous chemical substances stored on site shall be kept to a minimum. The quantity of each chemical stored shall be justifiable.

Storage and segregation requirements for all hazardous chemical substances to be used on site shall be based on:

- The quantities of the substances stored;
- The physical state of the substances (solid, liquid or gas);
- The degree of incompatibility; and • The known behaviour of the substances.

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Access to areas where hazardous chemical substances are stored and handled shall be limited and controlled.

Every chemical substance container shall be adequately and clearly labelled to identify its contents, to indicate precautionary requirements for the substance, and to indicate the date of expiry (if applicable). Pipes used to transfer / convey / distribute chemical substances shall be clearly identified (e.g. colour coding). Directional flow shall be indicated where practical.

Before any item, equipment or empty container containing a chemical residue is disposed of as general waste, it shall be properly decontaminated (where applicable). Before being disposed of, empty chemical containers shall also be rendered unusable for carrying water (by puncturing, cutting or crushing them).

Hazardous chemical substance waste (i.e. redundant / expired hazardous chemical substances, containers containing residues, contaminated items / materials, etc.) shall be disposed of in accordance with the applicable legislation.

Maintenance, inspection and testing schedules and procedures shall be in place for critical equipment associated with hazardous chemical substances. A system shall be in place to ensure that the risks are assessed before any changes are made to equipment and / or processes for the transportation, storage, handling, use or disposal of a hazardous chemical substance.

A programme shall be in place to continually investigate possibilities / opportunities for replacing hazardous substances with safer alternatives.

16.36 Radiation

The risks associated with ionising (from naturally occurring radioactive minerals (NORM), radon, and man-made sources), ultra violet (UV) and electromagnetic field (EMF) radiation exposure shall be assessed by a competent person.

There shall be an inventory of all radiation sources that have the potential to cause adverse health effects. For each radiation source, the type of radiation (e.g. radioisotope, radon, x-ray, EMF, laser, etc.), the strength of the radiation, and the location shall be recorded.

Where risk assessment indicates the need, a documented radiation management programme shall be developed such that:

- All types of radiation sources are adequately characterised and described;
- Exposures are eliminated or reduced to as low as reasonably practicable (ALARP);
- A clearly defined chain of responsibility (with duties) is provided; and
- Education is provided for employees regarding radiation safety, including the radiation management programme elements.

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The ionising radiation management programme shall meet all applicable regulatory requirements, and as a minimum shall include the following elements (as applicable):

- Surveyed radiation areas and quantification of exposure sources / levels;
- Exposure and medical monitoring programmes based on established investigation levels;
- Transport of radioactive materials in compliance with international radiation transport regulations, when no local regulations are in place;
- Waste monitoring and disposal programmes;
- Feedstock and equipment checks for naturally-occurring ionising radiation;
- Clearance and control procedures for all contaminated materials and equipment leaving or arriving at site (including scrap);
- Leak (wipe) tests on sealed radioactive containment equipment;
- Lock-out procedures for vessels and equipment containing radioactive sources and radon decay product measurement prior to entry;
- Emergency procedures;
- Environmental impact risk assessment (air, water, waste, foods, etc.);
- Product / waste life cycle control; and
- Dose assessment for employees and critical exposure groups, according to documented methods and by a competent person.

Areas with ionising radiation with annual doses greater than 5 milli Sieverts (mSv) shall be designated as restricted access or controlled areas. These areas shall be identified and mapped, signposted or otherwise clearly communicated to employees working in the area.

Each person whose potential exposure exceeds 5 mSv per annum or who is a designated radiation worker shall undergo periodic personal radiation monitoring and medical surveillance designed to show continued fitness for radiation work.

All sources of ionising radiation shall be managed in use and when they are either disposed of or securely stored in accordance with local regulations. Each operation where individual worker's exposures could exceed 5 mSv per annum shall have a trained radiation protection adviser or ready access to a trained protection consultant.

There shall be documented procedures for the inspection, assessment and maintenance of the controls, and emergency procedures to deal with incidents involving ionising radiation sources (including fire and explosions). All controls shall be reassessed annually to ensure their continued effectiveness and that operating practices are in accordance with written procedures.

16.37 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress shall be identified and described.

Where a risk of thermal stress is determined, a competent person shall conduct monitoring surveys on site, in consultation with workers.

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For defined extreme thermal conditions and job activities, medical examinations shall include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress shall be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects shall be adequately characterised and described. Workplace exposure assessment shall be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs shall be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss shall be worn.

Detailed cold stress assessment of identified tasks or jobs shall be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls shall be implemented:

- An acclimatisation period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls shall be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

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Where thermal stress is assessed to be a risk, the operation shall develop a suitable emergency response plan.

16.38 Fitness for Work and Fatigue Management

The contractor shall develop and implement a programme to manage employee fitness for work. All employees working on site for whom the contractor is responsible (i.e. direct employees of the contractor as well as the employees of any appointed sub-contractors) shall be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) shall be identified and the risks associated with reduced fitness for work in these roles shall be assessed.

A programme to manage these risks shall be implemented, and it shall include:

- Mechanisms for managing fatigue, stress and lack of fitness;
- An alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing;
- An Employee Assistance Programme providing confidential access to resources and counsellors; and
- Training and awareness programmes.

Each employee has an obligation to present himself fit for work at the start of the day / shift, and to remain fit for work throughout the work period. Reporting for work under the influence of alcohol or any other intoxicating substance will not be tolerated. Any transgression concerning the alcohol and other drugs policy applicable to the project may result in the offending employee's access to the project premises being temporarily or permanently withdrawn.

Alcohol and drug testing on the project premises will be carried out randomly (as employees report for duty and during the course of the day / shift), following significant incidents (all persons involved), and whenever there is reasonable suspicion. Alcohol and drug testing may also be carried out as part of a Pre-Employment Medical Examination.

The Contractor shall ensure that it complies to the requirements of RSR 00-4-1.2016 Edition 1, Part 4-1 Human Factors Management-Fatigue Management standard, Transnet Fatigue Risk Management Plan (FRMP) and Fatigue Risk Management System (FRMS).

The Contractor shall document, implement and maintain processes and procedures to identify, assess and mitigate the risks associated with fatigue's contributory factors.

The Contractor shall collect data and report on their management of fatigue as outlined in Clause 8.3 of Part 4-1 Human Factors Management-Fatigue Management standard.

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Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design shall consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours; • The impact on sleep cycles of activities such as commuting to and from site; and
- The monitoring and control of working hours.

The contractor is responsible for the administration of the working hours of his employees and of any appointed sub-contractors. The maximum working hours per day and the minimum rest times between shifts shall be specified in the contractor's SHE Management Plan and shall comply with all applicable legislation.

All employees engaged in safety critical jobs shall undergo fitness assessments (medical examinations) which shall be carried out prior to the commencement of employment on the contract, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the contract:

Note: The results of an Exit Medical Examination from previous employment will not be accepted as a Pre-Employment Medical Examination.

Note: The medical examinations described above may only be carried out by an occupational health practitioner.

A detailed job (role) description and an exposure profile (noise, dust, heat, fumes, vapours, etc.) shall be provided for each employee or group of employees. The medical examinations that an employee undergoes shall be based on (i.e. the employee's fitness shall be assessed against) the information contained in these documents as well as the baseline risk assessment for the work. This information shall be made available to the occupational health practitioner performing the medical examination.

For each role, the medical criteria for fitness shall be documented and these shall be based on an evaluation of the physical and medical requirements for the role.

Depending on the circumstances, certain vaccinations may need to be provided to employees.

The medical examinations carried out for all drivers and operators shall include testing / assessment for medical conditions that could affect the safe operation of vehicles or equipment.

Specific testing / questioning shall be carried out to determine if an individual:

- Suffers from epilepsy or any other medical condition deemed to be a risk by the occupational health practitioner;
- Makes use of chronic medication that could affect performance;

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- Is colour-blind; or
- Has poor day or night vision.

The medical examinations carried out for employees that are required to work at height shall include testing / questioning to determine if an individual suffers from epilepsy, hypertension (high blood pressure) or any other medical condition deemed to be a risk (with regard to working at height) by the occupational health practitioner. Electricians shall be tested for colour-blindness.

With regard to the placement of new employees:
- Prospective employees shall be referred to a suitable occupational medical practitioner (doctor) for a "Pre-Employment Medical Examination";
- If an individual is found to be medically "unfit for placement", the doctor will indicate which work activities cannot be performed by the person;
- The individual may still be employed on the project if his medical restrictions can be accommodated and provided that no legislation is transgressed.

A process shall be established to manage medical restrictions that may be placed on an employee. For every employee with a medical restriction, regular follow up visits with the occupational health practitioner shall be arranged to ensure that each case is proactively managed.

An employee in a safety critical job shall report (to his supervisor) any condition that might impair his ability to safely perform the duties associated with his role. A mechanism shall be in place for such reports to be referred to an occupational health practitioner to determine if the employee is fit to continue with his work.

Proof of all medical examinations (i.e. certificates of fitness signed by an occupational health practitioner) shall be kept on site and these records shall be readily available for inspection by the Transnet Contract Manager. An employee's certificates of fitness shall be included in his Personal Profile (dossier). If an Employee Personal Profile (dossier) hasn't already been compiled for a particular employee, then this shall be done without delay following the employee's Pre-Employment Medical Examination. No employee in a safety critical role may commence work on site without proof that he has undergone a Pre-Employment Medical Examination.

Occupational medical examinations and data interpretation may only be carried out by medical practitioners that are appropriately qualified and certified to do so. Occupational medical data contained in reports to management shall be grouped and summarised to ensure that the confidentiality rights of each individual employee are maintained. All occupational medical data and records shall be retained for at least 40 years.

16.39 Legionnaires Disease

All equipment with the potential for generating Legionella (such as cooling towers and associated equipment, air-handling systems, hot water services and showers) shall be identified and the risks of contamination and aerosol generation assessed.

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Where there is an assessed risk that Legionella could grow in the system and cause harm, a programme shall be in place such that:

- All such equipment is identified on a register. The register shall contain details of the regular maintenance, cleaning and checking programmes;
- Control measures are in place to minimise aerosol emissions;
- There shall be a documented water treatment programme, including procedures for inspection, assessment and maintenance of the controls; and
- New or retrofitted equipment is designed and constructed to minimise the risk of Legionella growth.

Where available, the Legionella plate count test should be used if more effective methods are not available.

Good maintenance procedures shall be followed to minimise the risk of significant contamination of equipment with other bacteria and microbial organisms.

Adequate procedures shall be available for disinfecting systems if significant concentrations of Legionella bacteria are present. Once disinfected, systems shall be retested to confirm effectiveness of treatment.

16.40 HIV / AIDS

The contractor shall assess the risks posed by HIV. Appropriate mitigation strategies shall be implemented as required.

Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.

All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, shall be maintained in medical confidence.

HIV / AIDS screening may not be a requirement for recruitment or a condition of employment.

16.41 Ballast Screeners

The contractor shall assess the risks posed by the activities associated with ballast screening. Appropriate mitigation strategies shall be implemented as required, including the control of silica dust.

The contractor shall ensure that the ballast screening is undertaken in such a manner that it does not pose a risk to the health and safety of employees, members of the public or damage to property.

All employees involved in the ballast screening are trained on the risks to their health and safety, appropriate mitigation strategies to be implemented.

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The contractor shall ensure that the operator of any equipment/machine used during the ballast screening is trained to operate such an equipment.

The contractor shall ensure that any equipment/machine used during the ballast screening are properly maintained and inspected at appropriate intervals. General machine safety checks including brake tests shall be done once a month and reports shall be available on the contractor compliance file/safety file.

The contractor shall ensure that technical and safety audits of the machinery and equipment shall be done at least twice a year and a report of such an audit is available in the contractor's compliance file. Appropriate mitigation strategies shall be implemented as required.

The contractor shall ensure that the welding activities in connection with the ballast screening are undertaken in such a manner that it does not pose a risk to the health and safety of employees, members of the public or damage to property.

17. Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the contractor will be audited by the Transnet Contract Manager, any person delegated by him or Transnet Health and Safety Specialist to assess compliance with the project health and safety requirements. Any deviation from these requirements (i.e. nonconformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the contractor shall identify and implement appropriate corrective actions.

For each corrective action, a responsible person shall be designated and an appropriate timeframe (target date) for completion of the corrective action shall be specified. Progress on implementing corrective actions (i.e. closing non-conformances) shall be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

Should it be determined that the contractor's level of compliance is unsatisfactory, all work being performed by the contractor on the project site may be stopped (at the contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Transnet Contract Manager or Health and Safety Specialist, the contractor shall carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the contractor's Health and Safety Management

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Plan). Furthermore, the contractor shall ensure that each appointed sub-contractor is audited and measured to the same standard. Copies of these audit reports shall be submitted to the Transnet Contract Manager on a monthly basis.
The contractor shall carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections shall be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections shall be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

18. Structure

The contractor shall ensure that,

- all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;
- No structure or part of a structure is loaded in a manner which would render it unsafe; and
- all drawings pertaining to the design of the relevant structure are kept on site and are available on request to an inspector, other contractors, the client and the client's agent or employee.

19. Emergency Preparedness and Response

The contractor shall develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the contractor's team and work activities. The plan shall be risk-based and shall detail the procedures that shall be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The contractor's Emergency Response Plan shall be aligned with the Emergency Response Plan developed by Transnet.
Potential off-site emergency scenarios shall be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

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Consideration shall be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers shall be included.

The Emergency Response Plan shall satisfy and comply with all applicable legal requirements. The plan shall be adequately resourced to ensure effective implementation. These resources shall include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices shall be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan shall be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan shall be established. The roles and responsibilities of each team member shall be clearly defined in the plan. Each team member shall receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting shall be incorporated into the Emergency Response Plan. The responsible person(s) shall be clearly identified, and the protocols for communicating with internal and external stakeholders shall be defined.

Emergency evacuation procedures shall be developed and included in the Emergency Response Plan. A copy of the plan shall be provided to the Transnet Contract Manager for approval prior to site establishment.

The Emergency Response Plan shall be formally reviewed (and amended if necessary) on at least an annual basis, and following any emergency situation, to ensure that it remains appropriate and effective.

At each work site:

- A suitable evacuation alarm (siren) shall be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the contractor shall be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded shall respond to it immediately.
- Suitable fire-fighting equipment shall be provided and maintained, and personnel shall be trained in fire-fighting procedures and the use of fire-fighting equipment.
- Suitable first aid equipment and supplies shall be provided and maintained, and an adequate number of appropriately trained First Aiders shall be in place (refer to Section 14.2).
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment shall be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) shall assemble and be accounted for at these emergency assembly points.

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- All personnel shall receive awareness training on the applicable emergency response procedures, and all visitors entering the site shall be properly instructed in these procedures.
- The emergency response procedures shall be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) shall be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.
- An up-to-date list of emergency telephone numbers shall be compiled and maintained. A copy of this list shall be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills shall be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills shall include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios shall be tested including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill shall be carried out one month after site establishment and six-monthly thereafter.

Each drill shall be monitored and the outcomes (highlights and shortcomings) shall be documented. Corrective actions shall be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures shall be amended as required.

19.1 First Aid Kits

A suitable first aid kit (i.e. appropriate to the level of training) shall be readily available to each First Aider. All kits shall be provided and maintained by the contractor.

Taking into account the type of injuries that are likely to occur in the workplace, each first aid kit shall contain suitable equipment and supplies. First aid equipment and supplies required by applicable legislation shall be provided as a minimum. Additional items / supplies may need to be provided depending on the nature of the workplace (specific hazards) and the level of training of the first aider in position of the kit.

The contents of each first aid kit shall be kept clean and dry. Access to first aid equipment / supplies shall be limited to train First Aiders only. Access to portable kit bags shall be controlled and steel first aid boxes in the workplace shall be kept locked.

Approved signage shall be in place to indicate the locations of the first aid boxes / bags.

A record of each treatment administered shall be kept in a suitable register.

20. Management Review

A review of the contractor's Health and Safety Management System shall be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

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The review shall evaluate if there is any need for change and shall identify actions to improve the system. The review shall be led by senior management and the following shall be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;
- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the contractor's scope, schedule, designs, etc.;
- Changes to the contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review shall be retained and it shall include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.

21. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the contractor shall develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process shall take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process shall aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;
- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised; • The right people are involved in the change process; and • All statutory requirements are met.

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All risks associated with a proposed change shall be evaluated and ranked. The risks that are ranked as moderate or higher shall be managed to prevent serious injury or illness.

It shall not simply be assumed that a change will not result in significant risks. All proposed changes shall be formally evaluated. The evaluation or review shall include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

22. Sub-contractor Alignment / Stakeholder management

Processes shall be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications shall be in place. A prospective sub-contractor's health and safety management expertise, experience and capability (including previous health and safety performance) shall be formally assessed prior to any contract or purchase order being awarded.

Each appointed sub-contractor shall develop and implement a detailed SHE Management Plan based on the requirements of the contractor's SHE Management Plan and the Health and Safety Specification for the contract. This plan shall be reviewed and approved by the contractor prior to the commencement of any work.

The properties of all materials provided to the project shall be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, shall be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all sub-contractor personnel shall receive comprehensive orientation and induction training

All work carried out by a sub-contractor shall be managed (activity supervised) throughout the contract period and performance shall be reviewed (audited) on a monthly basis

23. Section 37(2) Mandatary Agreement

Transnet and the Contractor shall enter into an agreement in terms of section 37(2) of the Occupational Health and Safety Act to the arrangements and procedures

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between them to ensure compliance by the contractor with the provisions of the OHS Act.

The agreement shall be completed and signed by the contractor mandated representative as soon as possible and returned to the relevant Transnet Contract Manager for his/her signature on behalf of Transnet.

The contractor shall enter into a Section 37(2) Agreement with their respective subcontractors. Signed copy of such agreement shall be kept on the contractor's compliance file.

24. Incident Reporting and Investigation

All incidents referred to in Regulation 9 of General Administration Regulations of the OHS Act and in terms of Railway Safety Act 30 of 2024 (and applicable SANS Codes) involving the contractor and his subcontractor on TRIM premises, shall be reported to the TRIM Contract Manager and Department of Labour as prescribed by the OHS Act

The contractor shall establish a procedure for the management of all health and safety incidents. This procedure shall define the responsibilities, methodologies and processes that shall be followed for: • Reporting an incident;

- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome shall be evaluated. Each impact shall be evaluated independently, with the most significant classification forming the primary rating of the incident.

A Near Hit is an incident. All Near Hits shall be reported.

An incident shall be reported on the same work day or shift on which it occurs and preliminary details shall be recorded. Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties shall be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work shall cease and shall only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence.

Work shall only be permitted to recommence once formal authorisation has been granted by the Transnet Contract Manager. In the case of incidents with an Actual

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Consequence of Major or Catastrophic, work shall not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Construction Manager shall ensure that an investigation is completed within 7 calendar days for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations shall be facilitated by competent and experienced persons who have been trained in the appropriate methodology.

Each incident (including Near Hits) shall be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident. Each incident shall be analysed to determine the root cause, and corrective actions shall be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person shall be designated and an appropriate timeframe (target date) for completion of the corrective action shall be specified. Progress on implementing corrective actions (i.e. closing incidents) shall be monitored and reported on. The implementation of corrective actions shall be verified during monthly audits by the Health and Safety Officers but also no later than 30 calendar days after the conclusion of the incident investigation.

The contractor shall document the results of each investigation and a report shall be submitted to the Transnet Contract Manager within five working days of the incident occurring.

As a minimum, each incident report shall include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);
- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident shall be summarised for its lessons learnt following the investigation. This information shall be reviewed by the contractor's Construction Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

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25. Non-conformance and Action Management

The contractor shall establish a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- Safety observations and coaching (safety interactions).

The contractor shall establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;
- Tracking and reporting on implementation status; and • Monitoring and verifying the effectiveness of the actions.

26. Performance Assessment and Auditing

The contractor shall establish and maintain programmes for measuring and monitoring HEALTH AND SAFETY performance on a regular basis. Metrics shall include leading and lagging indicators abe based on qualitative and quantitative data.

26.1 Reporting on Performance

Reports summarising the contractor's health and safety performance on the contract shall be compiled and reported to the Transnet Contract Manager on a monthly basis.

The contractor shall be prepared to discuss the content of these reports at scheduled health and safety meetings.

The reports shall contain the following information:

- Number of contractor and sub-contractor employees on site;
- Total hours worked on site by contractor and sub-contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;
- Details of all health and safety training carried out during the reporting period;
- Number of SOC's (Safety Observations and Coaching) carried out during the reporting period;

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- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);
- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) shall be analysed, and any negative trends identified with regard to unsafe behaviour or conditions shall be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) shall be investigated in detail to determine the root causes. Corrective actions shall be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

27. Safety permits (Railway Safety Act, 2024)

An operator or other person who intends to undertake or operates any railway or railway operation shall apply to the Regulator, for a safety permit.

The safety permit holder shall annually pay the safety permit fee applicable to the safety permit, in respect of every type of railway or railway operation authorised in that safety permit, irrespective of the period of validity of that safety permit. A permit holder shall, in the prescribed manner, apply to the Regulator for the renewal of a safety permit, at least three months prior to the expiry of the existing safety permit. A safety permit issued is not transferable. Any person who undertakes a railway or railway operation without a valid safety permit is guilty of an offence. Train Operating Company contracted to TRIM shall comply to Railway Safety Act 30 of 2024.

28. SANS 3000-2-6:2013 – Part 2-6: Management of Interfaces

The railway operators shall develop, review, implement or amend interface agreements signed with the network operator to enhance safe railway operations and conform with SANS 3000 -2-6. Parties will enter into the interface agreement with Network operator and other interfacing parties to conform with SANS 3000-2-6:2013

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– Part 2-6: Technical requirements for engineering and operational standards – Interoperability, and interface and interface management.

29. Confidentiality

The Contractor shall, at all times, consider all data or information given to him or that is required in connection with the work of the Company, as confidential and not makes unauthorized use of it.

He/she shall ensure that such data or information is not given to any non-employee of the contractor without written consent of the TRIM Contract Manager.

The Contractor shall be aware of the confidentiality of the mentioned information and is compelled to treat it accordingly.

The contractor shall provide adequate physical protection for any confidential documents, etc, which were obtained from Transnet in connection with the contract work as well as any copies made thereof. If any documents or sketches are lost, the TRIM Contract Manager must be notified immediately.

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