

Occupational Health and Safety Plan

Company name: _____

Project name: _____

NB Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details

2. Policy Statement

3. Objectives

4. Common Vocabulary

5. Legislation

6. Statutory Obligations

7. Project Management

- 7.1. Notification of Construction Work
- 7.2. Health and Safety Specification – Client to provide
- 7.3. Health and Safety Plan
- 7.4. Health and Safety File
- 7.5. Agreement with Mandatory
- 7.6. Appointment of Contractor
- 7.7. Site Organisation
 - 7.7.1. Assignment of Duties
 - 7.7.2. Construction Work Supervisor
 - 7.7.3. Subordinate Construction Work Supervisor
 - 7.7.4. Construction Safety Officer
 - 7.7.5. List of Contractors already appointed - List to be revised at least monthly
 - 7.7.6. Health and Safety Representative
 - 7.7.8. Scaffold Inspector
 - 7.7.9. Portable Fire Equipment Inspector

8. Incident Management

- 8.1. Performance Statistics
 - 8.1. Incident and or injuries
 - 8.1.1. Identity Document – certified by a Commissioner of Oaths
 - 8.1.2. Reporting
 - 8.1.3. Recording
 - 8.1.4. Investigation
 - 8.1.5. Statistics
 - 8.1.6. Medical certificate of fitness
 - 8.1.7. Noise induced hearing loss
- 8.2. Health and Safety Committee
 - 8.2.1. Composition
 - 8.2.2. Meetings

8.3. Legal Compliance Audits

8.3.1. Audits

8.3.2. Analysis

9. Logbooks and Registers

9.1. Electric Equipment / Tools Register - Portable

9.2. Fall Protection Plan

9.3. Fire fighting appliance Register - Portable

9.4. Personal Protective Equipment and Clothing

9.5. Scaffold Register

10. Risk Management

10.1. Task descriptions

10.2. Risk Identification

10.3. Risk Assessment

11. Education and Training

11.1. Induction training

11.2. Site Specific Training

11.3. Certificate of Competence

12. Emergency Planning – Evacuation plan

12.1. Client procedure

12.2. Site Procedure

13. Environment

13.1. Environment control plan

13.2. Environment monitoring

14. Health and Safety Communications

15. Safe working procedures

16. Personal Protective Equipment and Clothing

17. Project security

18. Implementation Costs

Costing must include but is not limited to the following -

18.1. Administration

18.2. Utilisation of SMMe, Emerging Contractors and the Local Community

18.3. Education, training and certification

18.4. Legal compliance audits

18.5. Personal Protective Equipment and Clothing

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1.

PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.2. **Agent:**

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Facsimile –

Cellular:

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Assignee Sect 16(2)

Contact No:

Telephone –

Facsimile

Cellular:

Email

1.4.2. Construction Work Supervisor:

Name:

Construction Regulation 6. (1)

Contact No:

Telephone

Facsimile

Cellular telephone No:

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle contractor and the other Contractors.

1.6. Duration of contract:

Start –

Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			

Project Manager:

Safety Advisors:

Telephone

Facsimile

Email

DEPARTMENT OF LABOUR

Provincial Office

Department of Labour:

Contact No:

OCCUPATIONAL HEALTH AND SAFETY

Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3.

Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all contractors and their employees working on this project.

4.

Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

- BCEA
- COIDA
- DoL
- DoL (IES)
- FEMA
- NBR&S
- OH&SA
- CR
- PD

5.

Legislation

Definition

“client” the person for whom any construction work is performed,

“agent” means any person, appointed in writing to represents the Client,

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,

“contractor” an employer who performs construction work,

Legislation

CR 4. (1)

CR 4 (5)

CR

CR

CR

CR

“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR
“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993),	CR
“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work,	CR
“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping,	CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(c) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6.

Statutory Obligations

Description

Legislation
BCE

6.1. Basic Conditions of Employment Act

The relevant sections are to be complied with special attention to at least the following –

Working hours,

Conditions of employment and Remuneration,

Termination of employment,

Employment of child labour prohibited.

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)

COIDA

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee's duties.

All employers-Principle contractor and Contractors must register with a compensation insurer – either COIDA or FEMA.

They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insured prior to commencing work on the project with a copy on Site.

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993)

OH&SA

The OH&SA is the primary law regulating occupational health and safety matters.

The Act is a framework Act that provides for the development of detailed rules and standards through regulation.

As a framework, the Act prescribes that -

(a). the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,

(b). the duties of employers to their employees, employees to their employer and suppliers to the employer and ©. the “reasonable man” approach by the employer in decisions concerning occupational health and safety, (f). the management, application and

enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle contractor and contractor.

(g). each principle contractor and contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from contractor to Principle contractor to the client.

Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description	By whom	Legislation
7.1. Notification of Construction Work.	Principle Contractor!	CR 3.1
7.2. Health and Safety Specification The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.	Client to provide.	CR 4. (1)(a)
7.3. Health and Safety Plan This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.	Contractor	CR 5. (1)
7.4. Health and Safety File All documentation – minutes of health and safety committee meetings, risk identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.	Contractor	CR 5. (7)
7.5. Agreement with Mandatory A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.	Client / Agent / Principle and Contractor	Act Sec 37(2)
7.6. Appointment of each Contractor by the Agent.		C R 5 (3) (b)
7.7. Organisation chart		
7.7.1. Assignment of Duties Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.	Contracts Manager	Act Sec 16(2)
7.7.2. Construction Supervisor Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.	Site Agent	CR 6. (1)
7.7.3. Sub-ordinate Construction Supervisor. Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1. NB Under no circumstances may a contractor leave employees on the site unless there is a competent construction work supervisor present.		CR 6. (2)
7.7.4. Construction Safety Officer Mr _____ has been appointed a part – time construction safety officer for the duration of the project.	Part-time/Full-time	CR 6. (6)

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box 1254 –

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile
Email:

Every contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB A section 37(2) Agreement with Mandatory must be entered into between the contractors and the principle contractor.

NB Contractor who contracts out construction work

Where a contractor contracts construction work out to another contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s

Act sect 18

Mr _____ is a designated health and safety representative.
He will perform his prescribed duties in his area of responsibility.

Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator.

C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector: _____

C R 14(2)

Mr _____ is appointed for this project.
Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8.

Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project.

Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury.

Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented.

The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES

Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

C O I D Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4. Investigation.

Sect 31

The severity of the injury will dictate whom and when the investigation must be conducted.

Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence.

A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a contractor is injured the contractor and the health and safety representative for the area in which it occurred will be part of the team.

The client or his agent may if they wish form part of the team.

A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted.

The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle contractor and contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle contractor's and all contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle contractor and every contractor. The following information must be recorded and kept on the health and safety file of the principle contractor / s and the contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted.

Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

- i) working in an elevated position,
- i. suspended platform,
- ii. Cranes – mobile - tower
- iii. Construction vehicles.

R 8. (2)(b)
CR 15(12) (a)
CR 20(g)
CR21 (1) (d)(ii)
CR 7. (1)

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary.

The prescribed conditions will apply as though it was legislated.

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. Composition.

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee.

The Health and safety representatives will be required to attend the health and safety committee meetings.

The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes.

The Client, Principle Agent must receive a copy of the minutes.

The audit of the contractors must be consolidated, analysed and submitted to the principle contractor and the client.

The findings will be documented, analyses and recommendations made.

Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required.

The action agreed on i.e. the responsible man test - and the time scheduling must be implemented.

As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. First aid Equipment

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project.

The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his findings in the appropriate register.

CR 27 (g)

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible.

As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained.

Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent.

Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified.

Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working,

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____	3 Short sharp blasts
--------------------	-----------------------------

Serious Incident : _____	Long – short – long blasts
All clear : _____	5 seconds

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based.

The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is “the study of work”. Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together.

Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

16 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board.

Where appropriate Newspaper clipping may be used during “tool box” talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

17. Safe work procedures.

A programme of safe work procedures is the be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed.

The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.

All procedures need to be documented.

18. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee.

The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle contractor and contractor must take all reasonable steps to ensure that PPE issued is used, worn and maintained as described. GSR 2(6)

19. Project / Site Security.

19.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site.

Suitable information signs must be strategically positioned.

They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

19.2. Access control

The Client is responsible for the access to and egress from the construction area.

20. Implementation costs.

The cost of implementation should include but are not limited to the following-

20.1. Administration

Project registration,

Occupational health and safety plan and file,

All assignments, appointments and designation,

Risk identifications and assessments and Logbooks and registers,

Health and safety committee meetings and minutes.

20.2. Training and Education

Induction training and badges,

First aid,

Health and safety representatives

Others - specify,

20.3. Legal compliance audits and reports.

Monthly or as required by the client.

20.4. Personal Protective Equipment and Clothing.

20.5. Other.

Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted.

This approved plan will be made available to each Contractor prior to their commencing construction work on the project.

We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

_____	_____	_____	_____
Name	Signature	Designation	Date

Principle Contractor

_____	_____	_____	_____
Name	Signature	Designation	Date

Principle Contractor

_____	_____	_____	_____
Name	Signature	Designation	Date

Occupational Health and Safety Plan

Company name: _____

Project name: _____

NB Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details

2. Policy Statement

3. Objectives

4. Common Vocabulary

5. Legislation

6. Statutory Obligations

7. Project Management

- 7.1. Notification of Construction Work
- 7.2. Health and Safety Specification – Client to provide
- 7.3. Health and Safety Plan
- 7.4. Health and Safety File
- 7.5. Agreement with Mandatory
- 7.6. Appointment of Contractor
- 7.7. Site Organisation
 - 7.7.1. Assignment of Duties
 - 7.7.2. Construction Work Supervisor
 - 7.7.3. Subordinate Construction Work Supervisor
 - 7.7.4. Construction Safety Officer
 - 7.7.5. List of Contractors already appointed - List to be revised at least monthly
 - 7.7.6. Health and Safety Representative
 - 7.7.8. Scaffold Inspector
 - 7.7.9. Portable Fire Equipment Inspector

8. Incident Management

- 8.1. Performance Statistics
 - 8.1. Incident and or injuries
 - 8.1.1. Identity Document – certified by a Commissioner of Oaths
 - 8.1.2. Reporting
 - 8.1.3. Recording
 - 8.1.4. Investigation
 - 8.1.5. Statistics
 - 8.1.6. Medical certificate of fitness
 - 8.1.7. Noise induced hearing loss
- 8.2. Health and Safety Committee
 - 8.2.1. Composition
 - 8.2.2. Meetings

8.3. Legal Compliance Audits

8.3.1. Audits

8.3.2. Analysis

9. Logbooks and Registers

9.1. Electric Equipment / Tools Register - Portable

9.2. Fall Protection Plan

9.3. Fire fighting appliance Register - Portable

9.4. Personal Protective Equipment and Clothing

9.5. Scaffold Register

10. Risk Management

10.1. Task descriptions

10.2. Risk Identification

10.3. Risk Assessment

11. Education and Training

11.1. Induction training

11.2. Site Specific Training

11.3. Certificate of Competence

12. Emergency Planning – Evacuation plan

12.1. Client procedure

12.2. Site Procedure

13. Environment

13.1. Environment control plan

13.2. Environment monitoring

14. Health and Safety Communications

15. Safe working procedures

16. Personal Protective Equipment and Clothing

17. Project security

18. Implementation Costs

Costing must include but is not limited to the following -

18.1. Administration

18.2. Utilisation of SMMe, Emerging Contractors and the Local Community

18.3. Education, training and certification

18.4. Legal compliance audits

18.5. Personal Protective Equipment and Clothing

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1.

PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.2. **Agent:**

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Facsimile –

Cellular:

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Assignee Sect 16(2)

Contact No:

Telephone –

Facsimile

Cellular:

Email

1.4.2. Construction Work Supervisor:

Name:

Construction Regulation 6. (1)

Contact No:

Telephone

Facsimile

Cellular telephone No:

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle contractor and the other Contractors.

1.6. Duration of contract:

Start –

Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			

Project Manager:

Safety Advisors:

Telephone

Facsimile

Email

DEPARTMENT OF LABOUR

Provincial Office

Department of Labour:

Contact No:

OCCUPATIONAL HEALTH AND SAFETY

Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3.

Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all contractors and their employees working on this project.

4.

Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

- BCEA
- COIDA
- DoL
- DoL (IES)
- FEMA
- NBR&S
- OH&SA
- CR
- PD

5.

Legislation

Definition

“client” the person for whom any construction work is performed,

“agent” means any person, appointed in writing to represent the Client,

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,

“contractor” an employer who performs construction work,

Legislation

CR 4. (1)

CR 4 (5)

CR

CR

CR

CR

“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR
“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993),	CR
“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work,	CR
“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping,	CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(c) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6.

Statutory Obligations

Description

6.1. Basic Conditions of Employment Act

The relevant sections are to be complied with special attention to at least the following –

Working hours,

Conditions of employment and Remuneration,

Termination of employment,

Employment of child labour prohibited.

Legislation
BCE

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee's duties.

All employers-Principle contractor and Contractors must register with a compensation insurer – either COIDA or FEMA.

They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insured prior to commencing work on the project with a copy on Site.

COIDA

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993)

The OH&SA is the primary law regulating occupational health and safety matters.

The Act is a framework Act that provides for the development of detailed rules and standards through regulation.

As a framework, the Act prescribes that -

(a). the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,

(b). the duties of employers to their employees, employees to their employer and suppliers to the employer and ©. the “reasonable man” approach by the employer in decisions concerning occupational health and safety, (f). the management, application and

enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle contractor and contractor.

(g). each principle contractor and contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

OH&SA

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from contractor to Principle contractor to the client.

Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description	By whom	Legislation
7.1. Notification of Construction Work.	Principle Contractor!	CR 3.1
7.2. Health and Safety Specification The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.	Client to provide.	CR 4. (1)(a)
7.3. Health and Safety Plan This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.	Contractor	CR 5. (1)
7.4. Health and Safety File All documentation – minutes of health and safety committee meetings, risk Identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.	Contractor	CR 5. (7)
7.5. Agreement with Mandatory A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.	Client / Agent / Principle and Contractor	Act Sec 37(2)
7.6. Appointment of each Contractor by the Agent.		C R 5 (3) (b)
7.7. Organisation chart		
7.7.1. Assignment of Duties Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.	Contracts Manager	Act Sec 16(2)
7.7.2. Construction Supervisor Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.	Site Agent	CR 6. (1)
7.7.3. Sub-ordinate Construction Supervisor. Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1. NB Under no circumstances may a contractor leave employees on the site unless there is a competent construction work supervisor present.		CR 6. (2)
7.7.4. Construction Safety Officer Mr _____ has been appointed a part – time construction safety officer for the duration of the project.	Part-time/Full-time	CR 6. (6)

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box 1254 –

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile
Email:

Every contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB A section 37(2) Agreement with Mandatory must be entered into between the contractors and the principle contractor.

NB Contractor who contracts out construction work

Where a contractor contracts construction work out to another contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s

Act sect 18

Mr _____ is a designated health and safety representative.
He will perform his prescribed duties in his area of responsibility.

Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator.

C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector: _____

C R 14(2)

Mr _____ is appointed for this project.
Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8.

Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project.

Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury.

Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented.

The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES

Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

C O I D Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4. Investigation.

Sect 31

The severity of the injury will dictate whom and when the investigation must be conducted.

Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence.

A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a contractor is injured the contractor and the health and safety representative for the area in which it occurred will be part of the team.

The client or his agent may if they wish form part of the team.

A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted.

The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle contractor and contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle contractor's and all contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle contractor and every contractor. The following information must be recorded and kept on the health and safety file of the principle contractor / s and the contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted.

Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

- i) working in an elevated position,
- i. suspended platform,
- ii. Cranes – mobile - tower
- iii. Construction vehicles.

R 8. (2)(b)
CR 15(12) (a)
CR 20(g)
CR21 (1) (d)(ii)
CR 7. (1)

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary.

The prescribed conditions will apply as though it was legislated.

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. Composition.

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee.

The Health and safety representatives will be required to attend the health and safety committee meetings.

The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes.

The Client, Principle Agent must receive a copy of the minutes.

The audit of the contractors must be consolidated, analysed and submitted to the principle contractor and the client.

The findings will be documented, analyses and recommendations made.

Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required.

The action agreed on i.e. the responsible man test - and the time scheduling must be implemented.

As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. First aid Equipment

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project.

The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his findings in the appropriate register.

CR 27 (g)

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible.

As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained.

Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent.

Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified.

Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working,

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____	3 Short sharp blasts
--------------------	-----------------------------

Serious Incident : _____	Long – short – long blasts
All clear : _____	5 seconds

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based.

The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is “the study of work”. Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together.

Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

16 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board.

Where appropriate Newspaper clipping may be used during “tool box” talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

17. Safe work procedures.

A programme of safe work procedures is the be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed.

The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.

All procedures need to be documented.

18. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee.

The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle contractor and contractor must take all reasonable steps to ensure that PPE issued is used, worn and maintained as described. GSR 2(6)

19. Project / Site Security.

19.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site.

Suitable information signs must be strategically positioned.

They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

19.2. Access control

The Client is responsible for the access to and egress from the construction area.

20. Implementation costs.

The cost of implementation should include but are not limited to the following-

20.1. Administration

Project registration,

Occupational health and safety plan and file,

All assignments, appointments and designation,

Risk identifications and assessments and Logbooks and registers,

Health and safety committee meetings and minutes.

20.2. Training and Education

Induction training and badges,

First aid,

Health and safety representatives

Others - specify,

20.3. Legal compliance audits and reports.

Monthly or as required by the client.

20.4. Personal Protective Equipment and Clothing.

20.5. Other.

Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted. This approved plan will be made available to each Contractor prior to their commencing construction work on the project.

We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Occupational Health and Safety Plan

Company name: _____

Project name: _____

NB Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details

2. Policy Statement

3. Objectives

4. Common Vocabulary

5. Legislation

6. Statutory Obligations

7. Project Management

- 7.1. Notification of Construction Work
- 7.2. Health and Safety Specification – Client to provide
- 7.3. Health and Safety Plan
- 7.4. Health and Safety File
- 7.5. Agreement with Mandatory
- 7.6. Appointment of Contractor
- 7.7. Site Organisation
 - 7.7.1. Assignment of Duties
 - 7.7.2. Construction Work Supervisor
 - 7.7.3. Subordinate Construction Work Supervisor
 - 7.7.4. Construction Safety Officer
 - 7.7.5. List of Contractors already appointed - List to be revised at least monthly
 - 7.7.6. Health and Safety Representative
 - 7.7.8. Scaffold Inspector
 - 7.7.9. Portable Fire Equipment Inspector

8. Incident Management

- 8.1. Performance Statistics
 - 8.1. Incident and or injuries
 - 8.1.1. Identity Document – certified by a Commissioner of Oaths
 - 8.1.2. Reporting
 - 8.1.3. Recording
 - 8.1.4. Investigation
 - 8.1.5. Statistics
 - 8.1.6. Medical certificate of fitness
 - 8.1.7. Noise induced hearing loss
- 8.2. Health and Safety Committee
 - 8.2.1. Composition
 - 8.2.2. Meetings

8.3. Legal Compliance Audits

8.3.1. Audits

8.3.2. Analysis

9. Logbooks and Registers

9.1. Electric Equipment / Tools Register - Portable

9.2. Fall Protection Plan

9.3. Fire fighting appliance Register - Portable

9.4. Personal Protective Equipment and Clothing

9.5. Scaffold Register

10. Risk Management

10.1. Task descriptions

10.2. Risk Identification

10.3. Risk Assessment

11. Education and Training

11.1. Induction training

11.2. Site Specific Training

11.3. Certificate of Competence

12. Emergency Planning – Evacuation plan

12.1. Client procedure

12.2. Site Procedure

13. Environment

13.1. Environment control plan

13.2. Environment monitoring

14. Health and Safety Communications

15. Safe working procedures

16. Personal Protective Equipment and Clothing

17. Project security

18. Implementation Costs

Costing must include but is not limited to the following -

18.1. Administration

18.2. Utilisation of SMMe, Emerging Contractors and the Local Community

18.3. Education, training and certification

18.4. Legal compliance audits

18.5. Personal Protective Equipment and Clothing

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1.

PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.2. **Agent:**

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Facsimile –

Cellular:

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Assignee Sect 16(2)

Contact No:

Telephone –

Facsimile

Cellular:

Email

1.4.2. Construction Work Supervisor:

Name:

Construction Regulation 6. (1)

Contact No:

Telephone

Facsimile

Cellular telephone No:

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle contractor and the other Contractors.

1.6. Duration of contract:

Start –

Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			

Project Manager:

Safety Advisors:

Telephone

Facsimile

Email

DEPARTMENT OF LABOUR

Provincial Office

Department of Labour:

Contact No:

OCCUPATIONAL HEALTH AND SAFETY

Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3.

Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all contractors and their employees working on this project.

4.

Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

BCEA
COIDA
DoL
DoL (IES)
FEMA
NBR&S
OH&SA
CR
PD

5.

Legislation

Definition

“client” the person for whom any construction work is performed,

“agent” means any person, appointed in writing to represents the Client,

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,

“contractor” an employer who performs construction work,

Legislation

CR 4. (1)

CR 4 (5)

CR

CR

CR

CR

“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR
“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993),	CR
“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work,	CR
“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping,	CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(c) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6.

Statutory Obligations

Description

Legislation
BCE

6.1. Basic Conditions of Employment Act

The relevant sections are to be complied with special attention to at least the following –

Working hours,

Conditions of employment and Remuneration,

Termination of employment,

Employment of child labour prohibited.

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)

COIDA

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee's duties.

All employers-Principle contractor and Contractors must register with a compensation insurer – either COIDA or FEMA.

They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insurer prior to commencing work on the project with a copy on Site.

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993)

OH&SA

The OH&SA is the primary law regulating occupational health and safety matters.

The Act is a framework Act that provides for the development of detailed rules and standards through regulation.

As a framework, the Act prescribes that -

(a). the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,

(b). the duties of employers to their employees, employees to their employer and suppliers to the employer and ©. the “reasonable man” approach by the employer in decisions concerning occupational health and safety, (f). the management, application and

enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle contractor and contractor.

(g). each principle contractor and contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from contractor to Principle contractor to the client.

Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description	By whom	Legislation
7.1. Notification of Construction Work.	Principle Contractor!	CR 3.1
7.2. Health and Safety Specification The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.	Client to provide.	CR 4. (1)(a)
7.3. Health and Safety Plan This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.	Contractor	CR 5. (1)
7.4. Health and Safety File All documentation – minutes of health and safety committee meetings, risk Identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.	Contractor	CR 5. (7)
7.5. Agreement with Mandatory A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.	Client / Agent / Principle and Contractor	Act Sec 37(2)
7.6. Appointment of each Contractor by the Agent.		C R 5 (3) (b)
7.7. Organisation chart		
7.7.1. Assignment of Duties Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.	Contracts Manager	Act Sec 16(2)
7.7.2. Construction Supervisor Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.	Site Agent	CR 6. (1)
7.7.3. Sub-ordinate Construction Supervisor. Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1. NB Under no circumstances may a contractor leave employees on the site unless there is a competent construction work supervisor present.		CR 6. (2)
7.7.4. Construction Safety Officer Mr _____ has been appointed a part – time construction safety officer for the duration of the project.	Part-time/Full-time	CR 6. (6)

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box 1254 –

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile
Email:

Every contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB A section 37(2) Agreement with Mandatory must be entered into between the contractors and the principle contractor.

NB Contractor who contracts out construction work

Where a contractor contracts construction work out to another contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s

Act sect 18

Mr _____ is a designated health and safety representative.
He will perform his prescribed duties in his area of responsibility.

Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator.

C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector: _____

C R 14(2)

Mr _____ is appointed for this project.
Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8.

Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project.

Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury.

Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented.

The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES

Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

C O I D Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4. Investigation.

Sect 31

The severity of the injury will dictate whom and when the investigation must be conducted.

Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence.

A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a contractor is injured the contractor and the health and safety representative for the area in which it occurred will be part of the team.

The client or his agent may if they wish form part of the team.

A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted.

The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle contractor and contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle contractor's and all contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle contractor and every contractor. The following information must be recorded and kept on the health and safety file of the principle contractor / s and the contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted.

Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

- i) working in an elevated position,
- i. suspended platform,
- ii. Cranes – mobile - tower
- iii. Construction vehicles.

R 8. (2)(b)
CR 15(12) (a)
CR 20(g)
CR21 (1) (d)(ii)
CR 7. (1)

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary.

The prescribed conditions will apply as though it was legislated.

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. Composition.

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee.

The Health and safety representatives will be required to attend the health and safety committee meetings.

The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes.

The Client, Principle Agent must receive a copy of the minutes.

The audit of the contractors must be consolidated, analysed and submitted to the principle contractor and the client.

The findings will be documented, analyses and recommendations made.

Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required.

The action agreed on i.e. the responsible man test - and the time scheduling must be implemented.

As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. First aid Equipment

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project.

The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his findings in the appropriate register.

CR 27 (g)

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible.

As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained.

Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent.

Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified.

Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working,

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____	3 Short sharp blasts
--------------------	-----------------------------

Serious Incident : _____	Long – short – long blasts
---------------------------------	-----------------------------------

All clear : _____	5 seconds
--------------------------	------------------

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based.

The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is “the study of work”. Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together.

Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

16 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board.

Where appropriate Newspaper clipping may be used during “tool box” talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

17. Safe work procedures.

A programme of safe work procedures is the be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed.

The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.

All procedures need to be documented.

18. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee.

The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle contractor and contractor must take all reasonable steps to ensure that PPE issued is used, worn and maintained as described. GSR 2(6)

19. Project / Site Security.

19.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site.

Suitable information signs must be strategically positioned.

They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

19.2. Access control

The Client is responsible for the access to and egress from the construction area.

20. Implementation costs.

The cost of implementation should include but are not limited to the following-

20.1. Administration

Project registration,

Occupational health and safety plan and file,

All assignments, appointments and designation,

Risk identifications and assessments and Logbooks and registers,

Health and safety committee meetings and minutes.

20.2. Training and Education

Induction training and badges,

First aid,

Health and safety representatives

Others - specify,

20.3. Legal compliance audits and reports.

Monthly or as required by the client.

20.4. Personal Protective Equipment and Clothing.

20.5. Other.

Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted. This approved plan will be made available to each Contractor prior to their commencing construction work on the project.

We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------



TECHNICAL

INFRASTRUCTURE

PARTICULAR SPECIFICATION

***PROVISION OF THREE PHASE CIRCUIT BREAKERS AT
VARIOUS SUBSTATIONS COUNTRYWIDE – STAGE 2:
PHASE 3***

Part C3

Section 7

TABLE OF CONTENTS

SECTION	CONTENTS	PAGE
7.1	SCOPE	3
7.2	DRAWINGS AND SPECIFICATIONS	3
7.3	MATERIALS	3
7.4	EQUIPMENT	3
7.5	CONSTRUCTION	4
	7.5.1 CONCRETE FOUNDATION	4
	7.5.2 STEELWORK	4
	7.5.3 PRIMARY CIRCUIT BREAKER	5
	7.5.4 CABLING AND WIRING	5
	7.5.5 EARTHING	6
7.6	TESTING	6
	APPENDIX 1 TECHNICAL DATA SHEET	
	APPENDIX 2 FUNCTIONAL TESTS	

7.1 SCOPE

Description

- 7.1.1 This particular specification covers the design, supply, installation/casting and testing of the following:
 - 7.1.1.1 SF6 gas filled circuit breakers (GCB) complete with operating mechanisms.
 - 7.1.1.2 Concrete and concrete foundations and any other work required for the proper completion of the foundations.
 - 7.1.1.3 Support steel work and other sundry steel items required for the completion of the work.
 - 7.1.1.4 It also covers the requirements for the supply and installation of cables and earthing in traction substations and any other item necessary for the completion of the works.
- 7.1.2 It includes removal of existing oil filled primary circuit breakers (OCBs), oil, foundations (where applicable) and steelwork at the various substations.
- 7.1.3 This specification also covers any other work arising out of or incidental to the above or required of the Contractor for the proper completion of the Works in accordance with the true meaning and intent of the contract document.

7.2 DRAWINGS AND SPECIFICATIONS

All work shall be done in accordance with specifications listed in section 4.1, drawings, manuals and other documentation to be supplied in compliance with requirements in section 2.4 and CEE.0224 including its Appendix.

7.3 MATERIALS

- 7.3.1 The Contractor shall supply all material needed to complete the work.
- 7.3.2 Transnet Freight Rail approved materials shall be used.
- 7.3.3 The material shall be as per applicable drawings and standard, generic and particular specifications.
- 7.3.4 Any material that does not conform to the requirements given shall be submitted to Transnet Freight Rail for approval before an order is placed.

7.4 EQUIPMENT

- 7.4.1 The Contractor shall supply all equipment necessary to perform the work.
- 7.4.2 Equipment used in the handling and erection of steelwork and circuit breakers shall comply with the requirements of Occupational Health and Safety Act (Act 85 of 1993).
- 7.4.3 Lifting and handling equipment shall have enough capacity to ensure that steelwork and circuit breakers are placed in their final position without damage.
- 7.4.4 The use of cranes, lifting devices, safety belts and harnesses shall comply with the recommendations of BS 5531.
- 7.4.5 The Contractor shall only use tools that are suitable for trenching, cutting of cables and properly terminating them.
- 7.4.6 All equipment, including testing equipment, shall be supplied by the Contractor.

7.5 CONSTRUCTION

7.5.1 Concrete Foundations

- 7.5.1.1 Before starting with the design, the Contractor shall first conduct soil type analysis and determine load bearing capabilities, where new foundations needs to be erected.
- 7.5.1.2 The foundation excavations shall be made in accordance with the design submitted by the Contractor and approved by Transnet Freight Rail.
- 7.5.1.3 Before pouring of the concrete, the Transnet Freight Rail's contract Supervisor or his Deputy shall first inspect the dimensions of the foundation holes. The concrete shall not be poured until this inspection has been made.
- 7.5.1.4 Water shall not be added to a mix after test cubes have been taken.
- 7.5.1.5 Hand mixed concrete shall not be acceptable.
- 7.5.1.6 The Contractor shall ensure that the inside of all concrete forms used is clean and free from hardened concrete.
- 7.5.1.7 The 28-day strength of all concrete used shall be a minimum of 20Mpa.
- 7.5.1.8 Equipment support foundations shall be finished off 200mm above ground level of the yard. The design must be such that it will prevent standing water.
- 7.5.1.9 All support foundations cast for the GCB's shall be at the same height.
- 7.5.1.10 All foundation edges shall be bevelled at 45°, and the surfaces must be float finished.
- 7.5.1.11 The Contractor shall also supply information regarding the curing period of concrete used.

7.5.2 Steelwork

- 7.5.2.1 The support steelwork to be supplied by the Contractor shall comply with the requirements of specification SANS 1431.
- 7.5.2.2 The Contractor shall ensure that the manufactured steel is free from defects before being transported to site. If any type of defect is found on the steel, it shall be repaired using the methods prescribed in the above specification.
- 7.5.2.3 It shall be the responsibility of the Contractor to safely transport the steelwork from the manufacturing point to the site of construction.
- 7.5.2.4 The Contractor shall ensure that the work is carried out strictly in accordance with the drawings supplied by him, and approved by the Employer's contract Supervisor.
- 7.5.2.5 All fasteners (nuts and bolts) shall be secured using flat or bevelled washers, if necessary, as well as lock washers.
- 7.5.2.6 Before erection commences, the Contractor shall submit to the Employer full details of the erection procedure and methods of erection.
- 7.5.2.7 During erection the Contractor shall ensure that each member is not bent, twisted or damaged.
- 7.5.2.8 The Contractor shall always maintain the safety standards for the duration of the construction work.
- 7.5.2.9 Care shall be taken to ensure that the handling and erection equipment does not overload the support steelwork.
- 7.5.2.10 All steelwork shall be galvanised in accordance with SANS 121.

- 7.5.2.11 For coastal areas, the steelwork shall be painted in accordance with CEE0045, in addition to hot dip galvanising.

7.5.3 Primary Circuit Breaker

- 7.5.3.1 The Contractor shall dismantle the old oil circuit breakers to be replaced.
- 7.5.3.2 The Contractor shall also remove oil from the circuit breakers and supply 210 litre drums for such purpose. The oil shall be disposed of in accordance with the requirements of section 6 of Part C3 (scope of work).
- 7.5.3.3 The circuit breakers shall be supplied and installed in accordance with the requirements of specifications BBB1267 and SANS 62271-100.
- 7.5.3.4 It shall be the responsibility of the Contractor to transport the new circuit breakers to site, and the old circuit breakers, oil and associated steelwork to the main depot (or to the sub-depot if required by the main depot).
- 7.5.3.5 Circuit breakers with a rating of 132kV shall be supplied for sites where the nominal system voltage is 88kV.
- 7.5.3.6 The Contractor shall ensure that the work is carried out strictly in accordance with the drawings supplied by him, and approved by the Employer's contract Supervisor.
- 7.5.3.7 Before erection commences, the Contractor shall submit to the Employer full details of the erection procedure and methods of erection.
- 7.5.3.8 Care shall be taken when erecting the circuit breakers by ensuring that the circuit breakers are not damaged, including their insulation.
- 7.5.3.9 The three poles of the circuit breaker at DC substations shall be colour coded according to the three phases (Red, White and Blue) of the supply voltage.
- 7.5.3.10 The two phase poles of the circuit breaker in AC substations shall be colour coded (Red, White/Blue) of the supply voltage as well.
- 7.5.3.11 The operation of the circuit breaker shall be in accordance with specification BBB2721.
- 7.5.3.12 GCB insulation shall be inculcated on site after erection of the stacks.

7.5.4 Cabling and Wiring

- 7.5.4.1 The Contractor shall supply and install new conductors to connect the primary circuit breakers to equipment on either side of it.
- 7.5.4.2 All armoured cables coming from the control equipment building and entering the GCB mechanism box shall be block jointed (50mm of armouring to be removed). The block jointing shall be done at about 150-200 mm below the gland on the GCB mechanism box. The block joint shall be covered with a heat shrink sleeve.
- 7.5.4.3 All control and power cables between the GCB and the control equipment building shall be replaced.
- 7.5.4.4 All armoured cables shall terminate in mechanical type glands and unarmoured cables shall terminate in compression glands. These glands shall be fitted with neoprene shrouds.
- 7.5.4.5 Cables and earthing conductors connected to equipment installed on steel support structures shall be supported on the steel structure vertically and horizontally by means of a cable tray. This cable tray shall be of the O-Line GS50 Gridspan Wire Mesh type or similar with the wire mesh having a diameter of 4mm and a hot dip galvanised finish.
- 7.5.4.6 The cables shall be fixed to the cable trays using UV stabilised cable ties.

- 7.5.4.7 All dissimilar metal connections (e.g. Cu to Al) shall be made using bi-metallic clamps that are specifically designed and manufactured to make that particular connection (ad hoc fabricated clamps are not acceptable).
- 7.5.4.8 All copper connections to steel (galvanised) shall be tinned.
- 7.5.4.9 Cabling and wiring shall be in accordance with CEE.0023 and SANS 10142-1.
- 7.5.4.10 In doing any cabling, the ballast stone shall be removed, trenching and laying of cables done, the soil compacted back and the ballast cleaned and placed back neatly.
- 7.5.4.11 No joining of cables or busbars will be accepted. The Contractor shall provide cables or busbars that are long enough for the application (earthing, control etc.). No junction boxes, underground, shall be used.
- 7.5.4.12 Where the existing/old circuit breaker mechanism box is currently used as a cable junction box, a polycarbonate box sized about (40cmx40cmx20cm = LxHxW) shall be used.
- 7.5.4.13 This box shall accommodate all cabling that was previously joined in the OCB mechanism box, like cabling from wave filter and AC disconnects.
- 7.5.4.14 It shall also house indoor-type AC earth leakage CT's that cannot be accommodated inside the circuit breaker mechanism box.
- 7.5.4.15 Low gas protection shall be wired into the existing control circuitry.
- 7.5.4.16 Indications for 'SF6 low gas' lockout and 'spring- charged and discharged' shall be added in the substation control panel and wired accordingly

7.5.5 Earthing

- 7.5.5.1 PVC insulated composite steel and tinned copper cable which has a resistance equivalent to a 95 millimetre square copper conductor shall be used for the earthing of the primary circuit breaker support steelwork.
- 7.5.5.2 All material supplied shall comply with the requirements of specification BBB3059 and drawing BBB3620.
- 7.5.5.3 The support steelwork for the circuit breakers shall be connected to the existing substation AC earthing system in accordance with drawing no. BBB3620 and the following clause:
 - 7.5.5.3.1 The Contractor shall supply and install insulation between the foundations and support steelwork, and also around the holding down bolts. The steel support structure shall be connected through earth leakage current transformer to AC earth mat.
 - 7.5.5.3.2 This insulation material can be fibre glass or similar.
- 7.5.5.4 The Contractor shall connect the earthing cable to the main earth system using brace welding.
- 7.5.5.5 Armouring of cables shall be bonded to the control equipment housing and the GCB mechanism box by means of a mechanical gland.
- 7.5.5.6 An earth conductor shall be provided in each cable for earthing purposes.

7.6 Tests and Measurements

7.6.1 General

- 7.6.1.1 The tests shall be conducted at the Contractor's approved testing facility, at his Sub-Contractor's facility or at the manufacturing facility.

- 7.6.1.2 At the end of the tests, the test results shall be issued to the Supervisor before any plant and material is transported to site.
- 7.6.1.3 The Employer reserves the right to witness these tests.
- 7.6.1.4 The Contractor shall notify the Employer of the tests 14 days before the start of such tests.
- 7.6.1.5 Type test certificates of the type of equipment offered shall be furnished with the tender.
- 7.6.2 Concrete**
 - 7.6.2.1 The Contractor shall arrange for sampling and testing of all concrete used and shall submit full records to the Supervisor. The method of sampling shall comply with specification S420.
 - 7.6.2.2 If ready mix concrete is used, the Contractor shall submit certificates confirming the strength of concrete to the Supervisor.
- 7.6.3 Steelwork**
 - 7.6.3.1 After the steelwork has been manufactured, it shall be inspected for any damage, twists and bends.
 - 7.6.3.2 The steelwork shall be supplied with test certificates in terms of clause 5.1 or 5.2 of SANS 1431 and these certificates shall be submitted to the Supervisor.
 - 7.6.3.3 Galvanising measurements shall be done to check compliance to specification.
- 7.6.4 Primary circuit breakers**
 - 7.6.4.1 After the circuit breakers have been manufactured, they shall be subjected to the routine tests that are prescribed in specification SANS 62271-100.
 - 7.6.4.2 Speed and contact resistance tests shall also be carried out on site.
- 7.6.5 Cabling and wiring**
 - 7.6.5.1 Before the Contractor starts laying cables in the trenches, the Supervisor or his deputy shall verify the dimensions of the trench and inspect the bedding in the trench before and after the laying of the cables.
- 7.6.6 Earthing**
 - 7.6.6.1 After the Contractor has finished trenching, the Supervisor or his Deputy shall inspect the trenching and measure the depth to confirm compliance with the requirements.
 - 7.6.6.2 The Contractor shall test and ensure that the earth resistance between the outdoor yard steelwork and earth mat, with the steelwork connected in parallel and disconnected from the AC earth system, is not less than 10 ohms.
 - 7.6.6.3 The employer shall conduct final earthing tests.

APPENDIX 1

TECHNICAL DATA SHEET – OUTDOOR

(To be filled in by the Tenderer)

1.0 DETAILS OF CIRCUIT BREAKER FOR 3KV DC AND EL&P SUBSTATIONS (3 POLE)

- 1.1 Make and manufacturer _____
- 1.2 Rated Voltage _____ kV
(Highest rated voltage for equipment)
- 1.3 Rated Insulation level _____ kV
(Rated lightning withstand Voltage)
- 1.4 Number of Poles: _____
- 1.5 Rated short circuit breaking current _____ kA
- 1.6 Rated normal current: _____ Ampere
- 1.7 Breaker operating time:
- 1.7.1 Closing: _____ ms
- 1.7.2 Opening: _____ ms
- 1.8 Number of operations after which breaker contact maintenance / measurement is required:
- 1.8.1 Under full load conditions _____
- 1.8.2 Under fault conditions _____
- 1.9 First Pole to clear factor _____
- 1.10 DC control voltage: _____ V

TECHNICAL DATA SHEET – OUTDOOR

(To be filled in by the Tenderer)

2.0 DETAILS OF CIRCUIT BREAKER FOR 25KV AC SUBSTATIONS (2 POLE)

- 2.1 Make and manufacturer _____
- 2.2 Rated Voltage _____ kV
(Highest rated voltage for equipment)
- 2.3 Rated Insulation level _____ kV
(Rated lightning withstand Voltage)
- 2.4 Number of Poles: _____
- 2.5 Rated short circuit breaking current _____ kA
- 2.6 Rated normal current: _____ Ampere
- 2.7 Breaker operating time:
- 2.7.1 Closing: _____ ms
- 2.7.2 Opening: _____ ms
- 2.8 Number of operations after which breaker contact maintenance / measurement is required:
- 2.8.1 Under full load conditions _____
- 2.8.2 Under fault conditions _____
- 2.9 First Pole to clear factor _____
- 2.10 DC control voltage: _____ V

APPENDIX 2

**COMMISSIONING TEST SHEET BY CONTRACTOR
PRIOR TO FINAL COMMISSIONING BY TRANSNET FREIGHT RAIL
TRACTION SUBSTATION**



FUNCTIONAL TESTS CARRIED OUT BY CONTRACTOR

CONTRACT NO:

SUBSTATION NAME	DEPOT	DATE

**FUNCTIONAL TESTS CARRIED OUT BY CONTRACTOR PRIOR TO
COMMISSIONING**

This document covers Functional Tests required to be done by Contractor prior to Commissioning by Transnet Freight Rail Test Officer

	FUNCTION	COMPLY (YES/NO)	COMMENTS
1.0	FUNCTIONAL TESTS IN AC YARD		
1.1	AC Disconnects to trip P.C.B when operating under load conditions		
1.2	Operation of Wave Filter Door switches to trip P.C.B		
1.3	Main Transformer Bucholz Relay to trip and lockout P.C.B giving indication		
1.4	Main Transformer Oil temp Relay to trip P.C.B giving indication		
1.5	Main Transformer Winding temp. Relay to trip and lockout P.C.B giving indication		
1.6	Winding and Oil Temp relays will only trip Unit Breaker if still in use.		
1.7	All lockout circuits will also trip the Unit Breaker with P.C.B if Unit Breakers are still in use		
1.8	Auxiliary Transformer Bucholz Relay to trip and lockout P.C.B giving indication		
1.9	P.C.B operation only when selector switch is in the Local position		

1.10	P.C.B to trip when 110V DC Supply is removed from the No Volt Coil		
1.11	All cables to Substation to be block jointed and covered with suitable heat shrink		
1.12	Operation of S.F.6 Low gas to trip and lockout P.C.B giving indication		

Contractor: _____

Name: _____

Signature: _____ **Date:** _____

Tests witnessed by: Transnet Freight Rail

Name: _____

Signature: _____ **Date:** _____



TECHNICAL

INFRASTRUCTURE

PARTICULAR SPECIFICATION

***PROVISION OF THREE PHASE CIRCUIT BREAKERS AT
VARIOUS SUBSTATIONS COUNTRYWIDE – STAGE 2:
PHASE 3***

Part C3

Section 7

TABLE OF CONTENTS

SECTION	CONTENTS	PAGE
7.1	SCOPE	3
7.2	DRAWINGS AND SPECIFICATIONS	3
7.3	MATERIALS	3
7.4	EQUIPMENT	3
7.5	CONSTRUCTION	4
	7.5.1 CONCRETE FOUNDATION	4
	7.5.2 STEELWORK	4
	7.5.3 PRIMARY CIRCUIT BREAKER	5
	7.5.4 CABLING AND WIRING	5
	7.5.5 EARTHING	6
7.6	TESTING	6
	APPENDIX 1 TECHNICAL DATA SHEET	
	APPENDIX 2 FUNCTIONAL TESTS	

7.1 SCOPE

Description

- 7.1.1 This particular specification covers the design, supply, installation/casting and testing of the following:
 - 7.1.1.1 SF6 gas filled circuit breakers (GCB) complete with operating mechanisms.
 - 7.1.1.2 Concrete and concrete foundations and any other work required for the proper completion of the foundations.
 - 7.1.1.3 Support steel work and other sundry steel items required for the completion of the work.
 - 7.1.1.4 It also covers the requirements for the supply and installation of cables and earthing in traction substations and any other item necessary for the completion of the works.
- 7.1.2 It includes removal of existing oil filled primary circuit breakers (OCBs), oil, foundations (where applicable) and steelwork at the various substations.
- 7.1.3 This specification also covers any other work arising out of or incidental to the above or required of the Contractor for the proper completion of the Works in accordance with the true meaning and intent of the contract document.

7.2 DRAWINGS AND SPECIFICATIONS

All work shall be done in accordance with specifications listed in section 4.1, drawings, manuals and other documentation to be supplied in compliance with requirements in section 2.4 and CEE.0224 including its Appendix.

7.3 MATERIALS

- 7.3.1 The Contractor shall supply all material needed to complete the work.
- 7.3.2 Transnet Freight Rail approved materials shall be used.
- 7.3.3 The material shall be as per applicable drawings and standard, generic and particular specifications.
- 7.3.4 Any material that does not conform to the requirements given shall be submitted to Transnet Freight Rail for approval before an order is placed.

7.4 EQUIPMENT

- 7.4.1 The Contractor shall supply all equipment necessary to perform the work.
- 7.4.2 Equipment used in the handling and erection of steelwork and circuit breakers shall comply with the requirements of Occupational Health and Safety Act (Act 85 of 1993).
- 7.4.3 Lifting and handling equipment shall have enough capacity to ensure that steelwork and circuit breakers are placed in their final position without damage.
- 7.4.4 The use of cranes, lifting devices, safety belts and harnesses shall comply with the recommendations of BS 5531.
- 7.4.5 The Contractor shall only use tools that are suitable for trenching, cutting of cables and properly terminating them.
- 7.4.6 All equipment, including testing equipment, shall be supplied by the Contractor.

7.5 CONSTRUCTION

7.5.1 Concrete Foundations

- 7.5.1.1 Before starting with the design, the Contractor shall first conduct soil type analysis and determine load bearing capabilities, where new foundations needs to be erected.
- 7.5.1.2 The foundation excavations shall be made in accordance with the design submitted by the Contractor and approved by Transnet Freight Rail.
- 7.5.1.3 Before pouring of the concrete, the Transnet Freight Rail's contract Supervisor or his Deputy shall first inspect the dimensions of the foundation holes. The concrete shall not be poured until this inspection has been made.
- 7.5.1.4 Water shall not be added to a mix after test cubes have been taken.
- 7.5.1.5 Hand mixed concrete shall not be acceptable.
- 7.5.1.6 The Contractor shall ensure that the inside of all concrete forms used is clean and free from hardened concrete.
- 7.5.1.7 The 28-day strength of all concrete used shall be a minimum of 20Mpa.
- 7.5.1.8 Equipment support foundations shall be finished off 200mm above ground level of the yard. The design must be such that it will prevent standing water.
- 7.5.1.9 All support foundations cast for the GCB's shall be at the same height.
- 7.5.1.10 All foundation edges shall be bevelled at 45°, and the surfaces must be float finished.
- 7.5.1.11 The Contractor shall also supply information regarding the curing period of concrete used.

7.5.2 Steelwork

- 7.5.2.1 The support steelwork to be supplied by the Contractor shall comply with the requirements of specification SANS 1431.
- 7.5.2.2 The Contractor shall ensure that the manufactured steel is free from defects before being transported to site. If any type of defect is found on the steel, it shall be repaired using the methods prescribed in the above specification.
- 7.5.2.3 It shall be the responsibility of the Contractor to safely transport the steelwork from the manufacturing point to the site of construction.
- 7.5.2.4 The Contractor shall ensure that the work is carried out strictly in accordance with the drawings supplied by him, and approved by the Employer's contract Supervisor.
- 7.5.2.5 All fasteners (nuts and bolts) shall be secured using flat or bevelled washers, if necessary, as well as lock washers.
- 7.5.2.6 Before erection commences, the Contractor shall submit to the Employer full details of the erection procedure and methods of erection.
- 7.5.2.7 During erection the Contractor shall ensure that each member is not bent, twisted or damaged.
- 7.5.2.8 The Contractor shall always maintain the safety standards for the duration of the construction work.
- 7.5.2.9 Care shall be taken to ensure that the handling and erection equipment does not overload the support steelwork.
- 7.5.2.10 All steelwork shall be galvanised in accordance with SANS 121.

- 7.5.2.11 For coastal areas, the steelwork shall be painted in accordance with CEE0045, in addition to hot dip galvanising.

7.5.3 Primary Circuit Breaker

- 7.5.3.1 The Contractor shall dismantle the old oil circuit breakers to be replaced.
- 7.5.3.2 The Contractor shall also remove oil from the circuit breakers and supply 210 litre drums for such purpose. The oil shall be disposed of in accordance with the requirements of section 6 of Part C3 (scope of work).
- 7.5.3.3 The circuit breakers shall be supplied and installed in accordance with the requirements of specifications BBB1267 and SANS 62271-100.
- 7.5.3.4 It shall be the responsibility of the Contractor to transport the new circuit breakers to site, and the old circuit breakers, oil and associated steelwork to the main depot (or to the sub-depot if required by the main depot).
- 7.5.3.5 Circuit breakers with a rating of 132kV shall be supplied for sites where the nominal system voltage is 88kV.
- 7.5.3.6 The Contractor shall ensure that the work is carried out strictly in accordance with the drawings supplied by him, and approved by the Employer's contract Supervisor.
- 7.5.3.7 Before erection commences, the Contractor shall submit to the Employer full details of the erection procedure and methods of erection.
- 7.5.3.8 Care shall be taken when erecting the circuit breakers by ensuring that the circuit breakers are not damaged, including their insulation.
- 7.5.3.9 The three poles of the circuit breaker at DC substations shall be colour coded according to the three phases (Red, White and Blue) of the supply voltage.
- 7.5.3.10 The two phase poles of the circuit breaker in AC substations shall be colour coded (Red, White/Blue) of the supply voltage as well.
- 7.5.3.11 The operation of the circuit breaker shall be in accordance with specification BBB2721.
- 7.5.3.12 GCB insulation shall be inculcated on site after erection of the stacks.

7.5.4 Cabling and Wiring

- 7.5.4.1 The Contractor shall supply and install new conductors to connect the primary circuit breakers to equipment on either side of it.
- 7.5.4.2 All armoured cables coming from the control equipment building and entering the GCB mechanism box shall be block jointed (50mm of armouring to be removed). The block jointing shall be done at about 150-200 mm below the gland on the GCB mechanism box. The block joint shall be covered with a heat shrink sleeve.
- 7.5.4.3 All control and power cables between the GCB and the control equipment building shall be replaced.
- 7.5.4.4 All armoured cables shall terminate in mechanical type glands and unarmoured cables shall terminate in compression glands. These glands shall be fitted with neoprene shrouds.
- 7.5.4.5 Cables and earthing conductors connected to equipment installed on steel support structures shall be supported on the steel structure vertically and horizontally by means of a cable tray. This cable tray shall be of the O-Line GS50 Gridspan Wire Mesh type or similar with the wire mesh having a diameter of 4mm and a hot dip galvanised finish.
- 7.5.4.6 The cables shall be fixed to the cable trays using UV stabilised cable ties.

- 7.5.4.7 All dissimilar metal connections (e.g. Cu to Al) shall be made using bi-metallic clamps that are specifically designed and manufactured to make that particular connection (ad hoc fabricated clamps are not acceptable).
- 7.5.4.8 All copper connections to steel (galvanised) shall be tinned.
- 7.5.4.9 Cabling and wiring shall be in accordance with CEE.0023 and SANS 10142-1.
- 7.5.4.10 In doing any cabling, the ballast stone shall be removed, trenching and laying of cables done, the soil compacted back and the ballast cleaned and placed back neatly.
- 7.5.4.11 No joining of cables or busbars will be accepted. The Contractor shall provide cables or busbars that are long enough for the application (earthing, control etc.). No junction boxes, underground, shall be used.
- 7.5.4.12 Where the existing/old circuit breaker mechanism box is currently used as a cable junction box, a polycarbonate box sized about (40cmx40cmx20cm = LxHxW) shall be used.
- 7.5.4.13 This box shall accommodate all cabling that was previously joined in the OCB mechanism box, like cabling from wave filter and AC disconnects.
- 7.5.4.14 It shall also house indoor-type AC earth leakage CT's that cannot be accommodated inside the circuit breaker mechanism box.
- 7.5.4.15 Low gas protection shall be wired into the existing control circuitry.
- 7.5.4.16 Indications for 'SF6 low gas' lockout and 'spring- charged and discharged' shall be added in the substation control panel and wired accordingly

7.5.5 Earthing

- 7.5.5.1 PVC insulated composite steel and tinned copper cable which has a resistance equivalent to a 95 millimetre square copper conductor shall be used for the earthing of the primary circuit breaker support steelwork.
- 7.5.5.2 All material supplied shall comply with the requirements of specification BBB3059 and drawing BBB3620.
- 7.5.5.3 The support steelwork for the circuit breakers shall be connected to the existing substation AC earthing system in accordance with drawing no. BBB3620 and the following clause:
 - 7.5.5.3.1 The Contractor shall supply and install insulation between the foundations and support steelwork, and also around the holding down bolts. The steel support structure shall be connected through earth leakage current transformer to AC earth mat.
 - 7.5.5.3.2 This insulation material can be fibre glass or similar.
- 7.5.5.4 The Contractor shall connect the earthing cable to the main earth system using brace welding.
- 7.5.5.5 Armouring of cables shall be bonded to the control equipment housing and the GCB mechanism box by means of a mechanical gland.
- 7.5.5.6 An earth conductor shall be provided in each cable for earthing purposes.

7.6 Tests and Measurements

7.6.1 General

- 7.6.1.1 The tests shall be conducted at the Contractor's approved testing facility, at his Sub-Contractor's facility or at the manufacturing facility.

- 7.6.1.2 At the end of the tests, the test results shall be issued to the Supervisor before any plant and material is transported to site.
- 7.6.1.3 The Employer reserves the right to witness these tests.
- 7.6.1.4 The Contractor shall notify the Employer of the tests 14 days before the start of such tests.
- 7.6.1.5 Type test certificates of the type of equipment offered shall be furnished with the tender.
- 7.6.2 Concrete**
- 7.6.2.1 The Contractor shall arrange for sampling and testing of all concrete used and shall submit full records to the Supervisor. The method of sampling shall comply with specification S420.
- 7.6.2.2 If ready mix concrete is used, the Contractor shall submit certificates confirming the strength of concrete to the Supervisor.
- 7.6.3 Steelwork**
- 7.6.3.1 After the steelwork has been manufactured, it shall be inspected for any damage, twists and bends.
- 7.6.3.2 The steelwork shall be supplied with test certificates in terms of clause 5.1 or 5.2 of SANS 1431 and these certificates shall be submitted to the Supervisor.
- 7.6.3.3 Galvanising measurements shall be done to check compliance to specification.
- 7.6.4 Primary circuit breakers**
- 7.6.4.1 After the circuit breakers have been manufactured, they shall be subjected to the routine tests that are prescribed in specification SANS 62271-100.
- 7.6.4.2 Speed and contact resistance tests shall also be carried out on site.
- 7.6.5 Cabling and wiring**
- 7.6.5.1 Before the Contractor starts laying cables in the trenches, the Supervisor or his deputy shall verify the dimensions of the trench and inspect the bedding in the trench before and after the laying of the cables.
- 7.6.6 Earthing**
- 7.6.6.1 After the Contractor has finished trenching, the Supervisor or his Deputy shall inspect the trenching and measure the depth to confirm compliance with the requirements.
- 7.6.6.2 The Contractor shall test and ensure that the earth resistance between the outdoor yard steelwork and earth mat, with the steelwork connected in parallel and disconnected from the AC earth system, is not less than 10 ohms.
- 7.6.6.3 The employer shall conduct final earthing tests.

APPENDIX 1

TECHNICAL DATA SHEET – OUTDOOR

(To be filled in by the Tenderer)

1.0 DETAILS OF CIRCUIT BREAKER FOR 3KV DC AND EL&P SUBSTATIONS (3 POLE)

- 1.1 Make and manufacturer _____
- 1.2 Rated Voltage _____ kV
(Highest rated voltage for equipment)
- 1.3 Rated Insulation level _____ kV
(Rated lightning withstand Voltage)
- 1.4 Number of Poles: _____
- 1.5 Rated short circuit breaking current _____ kA
- 1.6 Rated normal current: _____ Ampere
- 1.7 Breaker operating time:
- 1.7.1 Closing: _____ ms
- 1.7.2 Opening: _____ ms
- 1.8 Number of operations after which breaker contact maintenance / measurement is required:
- 1.8.1 Under full load conditions _____
- 1.8.2 Under fault conditions _____
- 1.9 First Pole to clear factor _____
- 1.10 DC control voltage: _____ V

TECHNICAL DATA SHEET – OUTDOOR

(To be filled in by the Tenderer)

2.0 DETAILS OF CIRCUIT BREAKER FOR 25KV AC SUBSTATIONS (2 POLE)

- 2.1 Make and manufacturer _____
- 2.2 Rated Voltage _____ kV
(Highest rated voltage for equipment)
- 2.3 Rated Insulation level _____ kV
(Rated lightning withstand Voltage)
- 2.4 Number of Poles: _____
- 2.5 Rated short circuit breaking current _____ kA
- 2.6 Rated normal current: _____ Ampere
- 2.7 Breaker operating time:
- 2.7.1 Closing: _____ ms
- 2.7.2 Opening: _____ ms
- 2.8 Number of operations after which breaker contact maintenance / measurement is required:
- 2.8.1 Under full load conditions _____
- 2.8.2 Under fault conditions _____
- 2.9 First Pole to clear factor _____
- 2.10 DC control voltage: _____ V

APPENDIX 2

**COMMISSIONING TEST SHEET BY CONTRACTOR
PRIOR TO FINAL COMMISSIONING BY TRANSNET FREIGHT RAIL
TRACTION SUBSTATION**



FUNCTIONAL TESTS CARRIED OUT BY CONTRACTOR

CONTRACT NO:

SUBSTATION NAME	DEPOT	DATE

**FUNCTIONAL TESTS CARRIED OUT BY CONTRACTOR PRIOR TO
COMMISSIONING**

This document covers Functional Tests required to be done by Contractor prior to Commissioning by Transnet Freight Rail Test Officer

	FUNCTION	COMPLY (YES/NO)	COMMENTS
1.0	FUNCTIONAL TESTS IN AC YARD		
1.1	AC Disconnects to trip P.C.B when operating under load conditions		
1.2	Operation of Wave Filter Door switches to trip P.C.B		
1.3	Main Transformer Bucholz Relay to trip and lockout P.C.B giving indication		
1.4	Main Transformer Oil temp Relay to trip P.C.B giving indication		
1.5	Main Transformer Winding temp. Relay to trip and lockout P.C.B giving indication		
1.6	Winding and Oil Temp relays will only trip Unit Breaker if still in use.		
1.7	All lockout circuits will also trip the Unit Breaker with P.C.B if Unit Breakers are still in use		
1.8	Auxiliary Transformer Bucholz Relay to trip and lockout P.C.B giving indication		
1.9	P.C.B operation only when selector switch is in the Local position		

1.10	P.C.B to trip when 110V DC Supply is removed from the No Volt Coil		
1.11	All cables to Substation to be block jointed and covered with suitable heat shrink		
1.12	Operation of S.F.6 Low gas to trip and lockout P.C.B giving indication		

Contractor: _____

Name: _____

Signature: _____ **Date:** _____

Tests witnessed by: Transnet Freight Rail

Name: _____

Signature: _____ **Date:** _____

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT





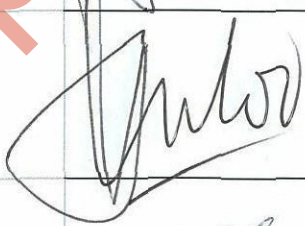

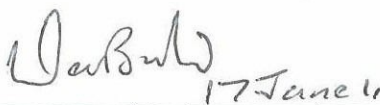

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

(This page not to be issued with contract)

SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

Author:	Project Manager Capital Program (Electrical)	G. Maposa	
Approved:	Senior Engineer Infra Engineering (Train Authorisation Systems)	J. van den Berg	
"	Principal Engineer Infra Engineering (Track)	M. Marutla	
"	Principal Engineer Infra Engineering (Structures)	J. Homan	
"	Principal Engineer Infra Engineering (Electrical)	J. Vosloo	
"	Principal Engineer Technology Management (Electrical)	W. Coetzee	
"	Chief Engineer Transport Telecoms	D. Botha	 17 June 11
Authorised:	Chief Engineer Infrastructure Engineering	J. van Aardt	 2011/06/30

Date:

May 2011

(This page not to be issued with contract)

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

CONTENTS

<u>CLAUSE</u>	<u>HEADING</u>	<u>PAGE</u>
1.0	SCOPE	3
2.0	DEFINITIONS	3
PART A - GENERAL SPECIFICATION		
3.0	AUTHORITY OF OFFICERS OF TRANSNET	4
4.0	CONTRACTOR'S REPRESENTATIVES AND STAFF	4
5.0	OCCUPATIONS AND WORK PERMITS	4
6.0	SPEED RESTRICTIONS AND PROTECTION	5
7.0	ROADS ON THE NETWORK OPERATOR'S PROPERTY	5
8.0	CLEARANCES	5
9.0	STACKING OF MATERIAL	5
10.0	EXCAVATION, SHORING, DEWATERING AND DRAINAGE	5
11.0	FALSEWORK FOR STRUCTURES	6
12.0	PILING	6
13.0	UNDERGROUND SERVICES	6
14.0	BLASTING AND USE OF EXPLOSIVES	6
15.0	RAIL TROLLEYS	7
16.0	SIGNAL TRACK CIRCUITS	7
17.0	PENALTY FOR DELAYS TO TRAINS	7
18.0	SURVEY BEACONS AND PEGS	7
19.0	TEMPORARY LEVEL CROSSINGS	8
20.0	COMPLETION OF THE WORKS	8
21.0	PROTECTION OF PERSONS AND PROPERTY	9
22.0	INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES	10
23.0	ACCESS, RIGHTS-OF-WAY AND CAMPSITES	10
24.0	SUPERVISION	10
25.0	HOUSING OF EMPLOYEES	10
26.0	OPTICAL FIBRE CABLE ROUTES	10
PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT		
27.0	GENERAL	11
28.0	WORK ON BUILDINGS OR FIXED STRUCTURES	11
29.0	WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING AND UNLOADING	11
30.0	USE OF EQUIPMENT	12
31.0	CARRYING AND HANDLING MATERIAL AND EQUIPMENT	12
32.0	PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE AND TREES ETC.	12
33.0	USE OF WATER	13
34.0	USE OF CONSTRUCTION PLANT	13
35.0	WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT	13
36.0	TRACTION RETURN CIRCUITS IN RAILS	13
37.0	HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR	14

1.0 SCOPE

- 1.1 This specification covers the network operator's requirements for general work and works on, over, under or adjacent to railway lines and near high voltage equipment.

2.0 DEFINITIONS

The following definitions shall apply:

"Authorised Person" - A person whether an employee of the network operator or not, who has been specially authorised to undertake specific duties in terms of Transnet' publication Electrical Safety Instructions, and who holds a certificate or letter of authority to that effect.

"Barrier" Any device designed to restrict access to "live" high-voltage electrical equipment.

"Bond" - A short conductor installed to provide electrical continuity.

"Contractor" - Any person or organisation appointed by the network operator to carry out work on its behalf.

"Contract Supervisor" - The person or juristic person appointed by the network operator from time to time as the Contract Supervisor, to administer the Contractor's performance and execution of the Works according to the powers and rights held by and obligations placed upon the Contract Supervisor in terms of the Contract.

"Dead" - Isolated and earthed.

"Electrical Officer (Contracts)" - The person appointed in writing by the Project Manager in terms of this specification as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

"Executive Officer" - The person appointed by the network operator from time to time as the Executive Officer to act according to the rights and powers held by and obligations placed upon him in terms of the Contract.

"High-Voltage" - A voltage normally exceeding 1000 volts.

"Live" - A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

"Near" - To be in such a position that a person's body or the tools he is using or any equipment he is handling may come within 3 metres of "live" exposed high-voltage electrical equipment.

"Occupation" - An authorisation granted by the network operator for work to be carried out under specified conditions on, over, under or adjacent to railway lines.

"Occupation Between Trains" - An occupation during an interval between successive trains.

"Optical Fibre Cable" - Buried or suspended composite cable containing optical fibres used in:

- telecommunication networks for transmission of digital information and
- safety sensitive train operations systems.

"Project Manager" - As defined in the special conditions of the contract. The person or juristic person appointed by the network operator from time to time as the Project Manager, to administer the Contract according to the powers and rights held by and obligations placed upon him in terms of the Contract.

"Responsible Representative" - The responsible person in charge, appointed by a contractor, who has undergone specific training (and holds a certificate) to supervise (general or direct) staff under his control who perform general work or to work on, over, under or adjacent to railway lines and in the vicinity of high-voltage electrical equipment.

"Total Occupation" - An occupation for a period when trains are not to traverse the section of line covered by the occupation.

"Work on" - Work undertaken on or so close to the equipment that the specified working clearances to the "live" equipment cannot be maintained.

"Work Permit" - A combined written application and authority to proceed with work on or near dead electrical equipment.

"Works" - The contractual intent for the work to be done as defined in the contract at a defined work site.

PART A - GENERAL SPECIFICATION**3.0 AUTHORITY OF OFFICERS OF TRANSNET**

- 3.1 The Contractor shall co-operate with the officers of the network operator and shall comply with all instructions issued and restrictions imposed with respect to the Works which bear on the existence and operation of the network operator's railway lines and high-voltage equipment.
- 3.2 Without limiting the generality of the provisions of clause 3.1, any duly authorised representative of the network operator, having identified himself, may stop the work if, in his opinion, the safe passage of trains or the safety of the network operator's assets or any person is affected. **CONSIDERATIONS OF SAFETY SHALL TAKE PRECEDENCE OVER ALL OTHER CONSIDERATIONS.**

4.0 CONTRACTOR'S REPRESENTATIVES AND STAFF

- 4.1 The Contractor shall nominate Responsible Representatives of whom at least one shall be available at any hour for call-out in cases of emergency. The Contractor shall provide the Contract Supervisor with the names, addresses and telephone numbers of the representatives.
- 4.2 The Contractor guarantees that he has satisfied himself that the Responsible Representative is fully conversant with this specification and that he shall comply with all his obligations in respect thereof.
- 4.3 The Contractor shall ensure that all contractor staff receives relevant awareness, educational and competence training regarding safety as prescribed.

5.0 OCCUPATIONS AND WORK PERMITS

- 5.1 Work to be done during total occupation or during an occupation between trains or under a work permit shall be done in a manner decided by the Contract Supervisor and at times to suit the network operator requirements.
- 5.2 The Contractor shall organise the Works in a manner which will minimise the number and duration of occupations and work permits required.
- 5.3 The network operator will not be liable for any financial or other loss suffered by the Contractor arising from his failure to complete any work scheduled during the period of an occupation or work permit.
- 5.4 The Contractor shall submit to the Contract Supervisor, in writing, requests for occupations or work permits together with details of the work to be undertaken, at least 21 days before they are required. The network operator does not undertake to grant an occupation or work permit for any particular date, time or duration.
- 5.5 The network operator reserves the right to cancel any occupation or work permit at any time before or during the period of occupation or work permit. If, due to cancellation or change in date or time, the Contractor is not permitted to start work under conditions of total occupation or work permit at the time arranged, all costs caused by the cancellation shall be born by the Contractor except as provided for in clauses 5.6 to 5.8.
- 5.6 When the Contractor is notified less than 2 hours before the scheduled starting time that the occupation or work permit is cancelled, he may claim reimbursement of his direct financial losses caused by the loss of working time up to the time his labour and plant are employed on other work, but not exceeding the period of the cancelled occupation or work permit.
- 5.7 When the Contractor is notified less than 2 hours before the scheduled starting time, or during an occupation or work permit, that the duration of the occupation or work permit is reduced, he may claim reimbursement of his direct financial losses caused by the loss of working time due to the reduced duration of the occupation or work permit.
- 5.8 Reimbursement of the Contractor for any loss of working time in terms of clause 5.6 and 5.7, shall be subject to his claims being submitted within 14 days of the event with full details of labour and plant involved, and provided that the Contract Supervisor certifies that no other work on which the labour and plant could be employed was immediately available.
- 5.9 Before starting any work for which an occupation has been arranged, the Contractor shall obtain from the Contract Supervisor written confirmation of the date, time and duration of the occupation.
- 5.10 Before starting any work for which a work permit has been arranged, the Responsible Representative shall read and sign portion C of the Work Permit, signifying that he is aware of the work boundaries within which work may be undertaken. After the work for which the permit was granted has been completed, or when the

work permit is due to be terminated, or if the permit is cancelled after the start, the same person who signed portion C shall sign portion D of the Work Permit, thereby acknowledging that he is aware that the electrical equipment is to be made "live". The Contractor shall advise all his workmen accordingly.

6.0 SPEED RESTRICTIONS AND PROTECTION

- 6.1 When speed restrictions are imposed by the network operator because of the Contractor's activities, the Contractor shall organise and carry out his work so as to permit the removal of the restrictions as soon as possible.
- 6.2 When the Contract Supervisor considers protection to be necessary the Contractor shall, unless otherwise agreed, provide all protection including flagmen, other personnel and all equipment for the protection of the network operator's and the Contractor's personnel and assets, the public and including trains.
- 6.2.1 The network operator will provide training free of charge of the Contractor's flagmen and other personnel performing protection duties. The Contractor shall consult with the Contract Supervisor, whenever he considers that protection will be necessary, taking into account the minimum permissible clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)
- 6.3 The Contractor shall appoint a Responsible Representative to receive and transmit any instruction which may be given by the network operator personnel providing protection.

7.0 ROADS AND ROADS ON THE NETWORK OPERATOR'S PROPERTY

- 7.1 The Contractor shall take every reasonable precaution to prevent damage to any roads or bridges used to obtain access to the site, and shall select routes, use vehicles, and restrict loads so that any extraordinary traffic as may arise from the moving of plant or material to or from the site shall be limited as far as is reasonably possible.
- 7.2 The Contractor shall not occupy or interfere in any way with the free use of any public or private road, right-of-way, path or street unless the Contract Supervisor has obtained the approval of the road authority concerned.

8.0 CLEARANCES

- 8.1 No temporary works shall encroach on the appropriate minimum clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)

9.0 STACKING OF MATERIAL

- 9.1 The Contractor shall not stack any material closer than 3m from the centre line of any railway line without prior approval of the Contract Supervisor.

10.0 EXCAVATION, SHORING, DEWATERING AND DRAINAGE

- 10.1 Unless otherwise approved by the Contract Supervisor any excavation adjacent to a railway line shall not encroach on the hatched area shown in Figure 1.

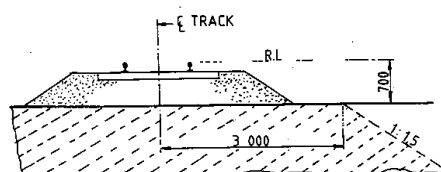


Fig. 1.

- 10.2 The Contractor shall provide, at his own cost any shoring, dewatering or drainage of any excavation unless otherwise stipulated elsewhere in the Contract.
- 10.3 Where required by the Contract Supervisor, drawings of shoring for any excavation under or adjacent to a railway line shall be submitted and permission to proceed, obtained before the excavation is commenced.
- 10.4 The Contractor shall prevent ingress of water to the excavation but where water does enter, he shall dispose of it as directed by the Contract Supervisor.
- 10.5 The Contractor shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with drainage.
- 11.0 FALSEWORK FOR STRUCTURES**
- 11.1 Drawings of falsework for the construction of any structure over, under or adjacent to any railway line shall be submitted to the Contract Supervisor and his permission to proceed obtained before the falsework is erected. Each drawing shall be given a title and a distinguishing number and shall be signed by a registered professional engineer certifying that he has checked the design of the falsework and that the drawings are correct and in accordance with the design.
- 11.2 After the falsework has been erected and before any load is applied, the Contractor shall submit to the Contract Supervisor a certificate signed by a registered professional engineer certifying that he has checked the falsework and that it has been erected in accordance with the drawings. Titles and numbers of the drawings shall be stated in the certificate. Notwithstanding permission given by the Contract Supervisor to proceed, the Contractor shall be entirely responsible for the safety and adequacy of the falsework.
- 12.0 PILING**
- 12.1 The Contract Supervisor will specify the conditions under which piles may be installed on the network operator's property.
- 13.0 UNDERGROUND SERVICES**
- 13.1 No pegs or stakes shall be driven or any excavation made before the Contractor has established that there are no underground services which may be damaged thereby.
- 13.2 Any damage shall be reported immediately to the Contract Supervisor, or to the official in charge at the nearest station, or to the traffic controller in the case of centralised traffic control.
- 14.0 BLASTING AND USE OF EXPLOSIVES**
- 14.1 When blasting within 500m of a railway line, the Contractor shall observe the requirements stipulated in this specification.
- 14.2 No blasting shall be carried out except with the prior written permission of the Contract Supervisor and under such conditions as he may impose.
- 14.3 On electrified lines the Contractor shall also obtain the permission of the Electrical Officer (Contracts) before blasting, and shall give at least 21 days notice of his intention to blast. No blasting shall be done in the vicinity of electrified lines unless a member of the network operator's electrical personnel is present.
- 14.4 The Contractor shall arrange for the supply, transport storage and use of explosives.
- 14.5 The Contractor shall have labour, tools and plant, to the satisfaction of the Contract Supervisor, available on the site to clear immediately any stones or debris deposited on the track or formation by blasting, and to repair any damage to the track or formation immediately after blasting. Repairs to the track shall be carried out only under the supervision of a duly authorised representative of the network operator.
- 14.6 The Contractor shall notify the Contract Supervisor of his intention to blast at least 21 days before the commencement of any blasting operations.
- 14.7 Before any blasting is undertaken, the Contractor and the Contract Supervisor shall jointly examine and measure up any buildings, houses or structures in the vicinity of the proposed blasting to establish the extent of any existing cracking or damage to such structures, etc. The Contractor, shall, subject to the provisions stipulated in the Contract Insurance Policy, make good any deterioration of such buildings, houses, or structures, which, in the opinion of the Contract Supervisor, was directly caused by the blasting.
- 14.8 After completion of the blasting the Contractor shall obtain a written clearance from each landowner in

the vicinity of the blasting operations to the effect that all claims for compensation in respect of damage caused by the blasting operations to their respective properties, have been settled.

14.9 The Contractor shall provide proof that he has complied with the provisions of clauses 10.17.1 to 10.17.4 of the Explosives Regulations (Act 26 of 1956 as amended).

14.10 Blasting within 500m of a railway line will only be permitted during intervals between trains. A person appointed by the Contract Supervisor, assisted by flagmen with the necessary protective equipment, will be in communication with the controlling railway station.

Only this person will be authorised to give the Contractor permission to blast, and the Contractor shall obey his instructions implicitly regarding the time during which blasting may take place.

14.11 The flagmen described in clause 14.10, where provided by the network operator, are for the protection of trains and the network operator's property only, and their presence does not relieve the Contractor in any manner of his responsibilities in terms of Explosives Act or Regulations, or any obligation in terms of this Contract.

14.12 The person described in clause 14.10 will record in a book provided and retained by the network operator, the dates and times:-

(i) when each request is made by him to the controlling station for permission to blast;

(ii) when blasting may take place;

(iii) when blasting actually takes place; and

(iv) when he advises the controlling station that the line is safe for the passage of trains.

14.13 Before each blast the Contractor shall record in the same book, the details of the blast to be carried out. The person appointed by the Contract Supervisor and the person who will do the blasting shall both sign the book whenever an entry described in clause 14.12 is made.

15.0 RAIL TROLLEYS

15.1 The use of rail trolleys or trestle trolleys on a railway line for working on high voltage equipment will be permitted only if approved by the Contract Supervisor and under the conditions stipulated by him.

15.2 All costs in connection with trolley working and any train protection services requested by the Contractor shall, be borne by the Contractor, unless otherwise agreed.

16.0 SIGNAL TRACK CIRCUITS

16.1 Where signal track circuits are installed, the Contractor shall ensure that no material capable of conducting an electrical current makes contact between rails of railway line/lines.

16.2 No signal connections on track-circuited tracks shall be severed without the Contract Supervisor's knowledge and consent.

17.0 PENALTY FOR DELAYS TO TRAINS

17.1 If any trains are delayed by the Contractor and the Contract Supervisor is satisfied that the delay was avoidable, a penalty will be imposed on the Contractor as stipulated in the contract, for the period and number of trains delayed.

18.0 SURVEY BEACONS AND PEGS

18.1 The Contractor shall not on any account move or damage any beacon, bench mark, reference mark, signal or trigonometrical station in the execution of the Works without the written approval of the Contract Supervisor.

Should the Contractor be responsible for any such occurrence, he shall report the circumstances to the Contract Supervisor who will arrange with the Director-General of Surveys for replacement of the beacon or mark at the cost of the Contractor.

18.2 The Contractor shall not move or damage any cadastral or mining beacon without the written approval of the Contract Supervisor and before it has been referenced by a registered land surveyor. Any old boundary beacon, which becomes an internal beacon on creation of new boundaries, shall not be moved without the written approval of the Contract Supervisor.

Should the Contractor move or damage any cadastral or mining beacon without authority, he shall be responsible for having it replaced, at his cost, by a land surveyor.

- 18.3 The Contractor shall preserve all pegs and bench marks. Such survey points shall not be removed without the written approval of the Contract Supervisor. Should any peg or benchmark be removed without authority, the Contract Supervisor will arrange for its replacement and the cost will be recovered from the Contractor. No claim will be considered for delay in replacing any such peg or bench mark. Each peg replaced shall be checked by the Contractor.

- 18.4 Where a new boundary has been established, beacons on the fence line shall not be disturbed, and fence posts or anchors may not be placed or excavations made within 0,6 m of any beacon without the prior written approval of the Contract Supervisor.

19.0 TEMPORARY LEVEL CROSSINGS

- 19.1 The Contract Supervisor may, on request of the Contractor, and if necessary for the purpose of execution of the Works, permit the construction of a temporary level crossing over a railway a line at a position approved by the Contract Supervisor and at the Contractor's cost. The period for which the temporary level crossing is permitted will be at the discretion of the Contract Supervisor.

- 19.2 The Contractor will provide protection and supervise the construction of the road over the track(s) and within the railway servitude at the level crossing, as well as the erection of all road signs and height gauges. All cost to be borne by the applicant.

The Contractor shall exercise extreme caution in carrying out this work, especially in respect of damage to tracks, services, overhead power and communications routes and prevent contact with "live" overhead electrical equipment.

Unless otherwise agreed, the Contractor will provide the service deviations or alterations to the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to accommodate the level crossing.

- 19.3 The Contractor shall take all necessary steps including the provision of gates, locks and, where necessary, watchmen to restrict the use of the temporary level crossing to himself and his employees, his subcontractors and their employees, the staff of the network operator and to such other persons as the Contract Supervisor may permit and of whose identity the Contractor will be advised. If so ordered by the Contract Supervisor, the Contractor shall provide persons to control road traffic using the temporary level crossing. Such persons shall stop all road traffic when any approaching train is within seven hundred and fifty (750) metres of the temporary level crossing, and shall not allow road traffic to proceed over it until the lines are clear.

- 19.4 The Contractor shall maintain the temporary level crossing within the railway servitude in good condition for the period it is in use. A temporary agreement with the road authority to be concluded for the maintenance of the level crossing outside the railway servitude.

- 19.5 When the temporary level crossing is no longer required by the Contractor, or permitted by the network operator, the Contractor shall at his own cost remove it and restore the site and the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to its original condition. Work over the tracks and within the railway servitude will be supervised by the network operator.

20.0 COMPLETION OF THE WORKS

- 20.1 On completion of the works, the Contractor shall remove all the remaining construction plant and material from the site, other than material which is the property of the network operator, and leave the site in a clean, neat and tidy condition. If material and plant is required for the liability and maintenance period the Contract supervisor must authorise it's retention on site.

21.0 PROTECTION OF PERSONS AND PROPERTY

- 21.1 The Contractor shall provide and maintain all lights, guards, barriers, fencing and watchmen when and where necessary or as required by the Contract Supervisor or by any statutory authority, for the protection of the Works and for the safety and convenience of the public.

Red, yellow, green or blue lights may not be used by the Contractor as they can be mistaken for signals. Red, yellow, green or white flags shall only be used for protection by the Contractor. Within the precincts of a port the Contractor shall obtain the permission of the Port Captain before installing any light.

- 21.2 The Contractor shall take all the requisite measures and precautions during the course of the Works to:
- (i) protect the public and property of the public,
 - (ii) protect the property and workmen of both the network operator and the Contractor,
 - (iii) avoid damage to and prevent trespass on adjoining properties, and
 - (iv) ensure compliance with any instruction issued by the Contract Supervisor or other authorised person, and with any stipulation embodied in the contract documents which affects the safety of any person or thing.
- 21.3 The network operator will provide, at its own cost, protection for the safe working of trains during such operations as the Contract Supervisor may consider necessary. Protection by the network operator for any purpose whatsoever, does not absolve the Contractor of his responsibilities in terms of the Contract.
- 21.4 The Contractor shall take all precautions and appoint guards, watchmen and compound managers for prevention of disorder among and misconduct by the persons employed on the Works and by any other persons, whether employees or not, on the work site and for the preservation of the peace and protection of persons and property in the direct neighbourhood. Any relocation of camps because of disorder shall be at the Contractor's expense.
- 21.5 All operations necessary for the execution of the Works, including the provision of any temporary work and camping sites, shall be carried out so as not to cause veldt fires, ground and environmental pollution, soil erosion or restriction of or interference with streams, furrows, drains and water supplies.
- If the original surface of the ground is disturbed in connection with the Works, it shall be made good by the Contractor to the satisfaction of the land owner, occupier or responsible authority.
- 21.6 The Contractor shall take all reasonable steps to minimise noise and disturbance when carrying out the Works, including work permitted outside normal working hours.
- 21.7 Dumping of waste or excess materials by the Contractor shall, in urban areas, be done under the direction and control of, and at sites made available by the local authority. Dumping outside local authority boundaries shall be done only with the express permission and under the direction and control of the Contract Supervisor.
- 21.8 The Contractor shall comply with environmental protection measures and specifications stipulated by the Contract Supervisor and/or local and environmental authorities.
- 22.0 INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES**
- 22.1 The Contractor shall not interfere in any manner whatsoever with an open line, nor shall he carry out any work or perform any act which affects the security, use or safety of an open line except with the authority of the Contract Supervisor and in the presence of a duly authorised representative of the network operator.
- 22.2 The Contractor shall not carry out any work or operate any plant, or place any material whatsoever nearer than three metres from the centre line of any open line except with the written permission of the Contract Supervisor and subject to such conditions as he may impose.
- 22.3 Care must be taken not to interfere with or damage any services such as overhead wire routes, cables or pipes and optical fibre cable, except as provided for the work specified. The Contractor will be held responsible for any damage to or interruption of such services arising from any act or omission on his part or of any of his employees, or persons engaged by him on the Works. The cost of repairing, replacing or restoring the services, as well as all other costs arising from any damage to services, shall be borne by, and will be recovered from the Contractor.
- 22.4 Authority granted by the Contract Supervisor and the presence of an authorised representative of the network operator in terms hereof, shall not relieve the Contractor of his duty to comply with this specification.
- 23.0 ACCESS, RIGHTS-OF-WAY AND CAMPSITES**
- 23.1 Where entry onto the network operator's property is restricted, permission to enter will be given only for the purpose of carrying out the Works and will be subject to the terms and conditions laid down by the network operator.
- 23.2 The Contractor shall arrange for campsites, workplaces and access thereto as well as for any right-of-

way over private property to the site of the Works, and for access within the boundaries of the network operator's property. The owners of private property to be traversed shall be approached and treated with tact and courtesy by the Contractor, who shall, if necessary, obtain a letter of introduction to such property owners from the Contract Supervisor.

The Contractor shall be responsible for the closing of all gates on roads and tracks used by him or his employees. Except with the prior approval of the Contract Supervisor and the owner or occupier of any private land to be traversed, the Contractor shall not cut, lower, damage, remove or otherwise interfere with any fence or gate which is either on the network operator's property or on private property and which restricts access to the Works. Where such approval has been given, the Contractor shall prevent entry of animals or unauthorised persons onto the network operator's or private property, and shall make the fences safe against trespass at the close of each day's work.

- 23.3 The Contractor shall take all reasonable steps to confine the movement of vehicles and plant to the approved right-of-way to minimise damage to property, crops and natural vegetation.
- 23.4 When access is no longer required, and before completion of the Works, the Contractor shall repair, restore or replace any fence or gate damaged during execution of the Works to the satisfaction of the Contract Supervisor and shall furnish the Contract Supervisor with a certificate signed by the owner and occupier of land over which he has gained access to a campsite, workplace and the Works, certifying that the owner and occupier have no claim against the Contractor or the network operator arising from the Contractor's use of the land. Should the Contractor be unable to obtain the required certificate, he shall report the circumstances to the Contract Supervisor.

24.0 SUPERVISION

- 24.1 The Contract Supervisor will provide overall technical superintendence of the Works, and may direct the Contractor in terms of the provisions of the Contract or in respect of any measures which the Contract Supervisor may require for the operations of the network operator, the safety of trains, property and workmen of the network operator, and for the safety of other property and persons. The Contractor shall carry out the directions of the Contract Supervisor. The superintendence exercised by the Contract Supervisor, including any agreement, approval, refusal or withdrawal of any approval given, shall not relieve the Contractor of any of his duties and liabilities under the Contract, and shall not imply any assumption by the network operator or by the Contract Supervisor of the legal and other responsibilities of the Contractor in carrying out the Works.
- 24.2 The Contract Supervisor may delegate to any deputy or other person, any of his duties or functions under the Contract. On receiving notice in writing of such delegation, the Contractor shall recognise and obey the deputy or person to whom any such duties or functions have been delegated as if he were the Contract Supervisor.
- 24.3 The Contractor shall exercise supervision over the Works at all times when work is performed or shall be represented by an agent having full power and authority to act on behalf of the Contractor. Such agent shall be competent and responsible, and have adequate experience in carrying out work of a similar nature to the Works, and shall exercise personal supervision on behalf of the Contractor. The Contract Supervisor shall be notified in writing of such appointment which will be subject to his approval.
- 24.4 The Contractor or his duly authorised agent shall be available on the site at all times while the Works are in progress to receive the orders and directions of the Contract Supervisor.

25.0 HOUSING OF EMPLOYEES

- 25.1 The Contractor shall, where necessary, make his own arrangements for suitable housing of his employees. Where temporary housing is permitted by the Contract Supervisor on any part of the site, the Contractor shall provide suitable sanitation, lighting and potable water supplies in terms of the requirements of the local authority or the current network operator's specification; Minimum Communal Health Requirements in Areas outside the Jurisdiction of a Local Authority - E.4B, as applicable.
- 25.2 Fouling the area inside or outside the network operator's boundaries shall be prevented. The Contractor will be called upon by the Contract Supervisor to dispose of any foul or waste matter generated by the Contractor.

26.0 OPTICAL FIBRE CABLE ROUTES

- 26.1 The Contractor shall not handle, impact, move or deviate any optical fibre cable without prior approval.
- 26.2 Works that in any way affect the optical fibre cable requires prior approval from the Contract Supervisor

who will determine the work method and procedures to be followed.

"Preview Copy Only"

PART B - SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT

27.0 GENERAL

- 27.1 This specification is based on the contents of Transnet's publication ELECTRICAL SAFETY INSTRUCTIONS, as amended, a copy of which will be made available on loan to the Contractor for the duration of the contract.

These instructions apply to all work near "live" high-voltage equipment maintained and/or operated by the network operator, and the onus rests on the Contractor to ensure that he obtains a copy.

- 27.2 This specification must be read in conjunction with and not in lieu of the Electrical Safety Instructions.
- 27.3 The Contractor's attention is drawn in particular to the contents of Part I, Sections 1 and 2 of the Electrical Safety Instructions.
- 27.4 The Electrical Safety Instructions cover the minimum safety precautions which must be taken to ensure safe working on or near high-voltage electrical equipment, and must be observed at all times. Should additional safety measures be considered necessary because of peculiar local conditions, these may be ordered by and at the discretion of the Electrical Officer (Contracts).
- 27.5 The Contractor shall obtain the approval of the Electrical Officer (Contracts) before any work is done which causes or could cause any portion of a person's body or the tools he is using or any equipment he is handling, to come within 3 metres of any "live" high-voltage equipment.
- 27.6 The Contractor shall regard all high-voltage equipment as "live" unless a work permit is in force.
- 27.7 Safety precautions taken or barriers erected shall comply with the requirements of the Electrical Officer (Contracts), and shall be approved by him before the work to be protected is undertaken by the Contractor. The Contractor shall unless otherwise agreed, bear the cost of the provision of the barriers and other safety precautions required, including the attendance of the network operator's staff where this is necessary.
- 27.8 No barrier shall be removed unless authorised by the Electrical Officer (Contracts).

28.0 WORK ON BUILDINGS OR FIXED STRUCTURES

- 28.1 Before any work is carried out or measurements are taken on any part of a building, fixed structure or earthworks of any kind above ground level situated within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted to ascertain the conditions under which the work may be carried out.
- 28.2 No barrier erected to comply with the requirements of the Electrical Officer (Contracts) shall be used as temporary staging or shuttering for any part of the Works.
- 28.3 The shuttering for bridge piers, abutments, retaining walls or parapets adjacent to or over any track may be permitted to serve as a barrier, provided that it extends at least 2,5 metres above any working level in the case of piers, abutments and retaining walls and 1,5 metres above any working level in the case of parapets.

29.0 WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING OR UNLOADING

- 29.1 No person may stand, climb or work, whilst on any platform, surface or foothold:
- 29.1.1 higher than the normal unrestricted access way, namely -
 - 29.1.1.1 external walkways on diesel, steam and electric locomotives, steam heat vans, etc. and
 - 29.1.1.2 walkways between coaches and locomotives.
 - 29.1.2 of restricted access ways in terms of the Electrical Safety Instructions namely -
 - 29.1.2.1 the floor level of open wagons
 - 29.1.2.2 external walkways or decks of road-rail vehicles, on-track maintenance machines and material trains.
 - 29.1.3 Unauthorised staff working on these platforms must be directly supervised by duly authorised persons in terms of clause 607.1.3 of the Electrical Safety Instructions. These persons must attend the relevant electrical safety module training. A letter of training must then be issued by an accredited training authority. A Category C Certificate of Authority must be obtained from the

local depot examining officer.

- 29.2 When in the above positions no person may raise his hands or any equipment he is handling above his head.
- 29.3 In cases where the Contractor operates his own rail mounted equipment, he shall arrange for the walkways on this plant to be inspected by the Electrical Officer (Contracts) and approved, before commencement of work.
- 29.4 The handling of long lengths of material such as metal pipes, reinforcing bars, etc should be avoided, but if essential they shall be handled as nearly as possible in a horizontal position below head height.
- 29.5 The Responsible Representative shall warn all persons under his control of the danger of being near "live" high-voltage equipment, and shall ensure that the warning is fully understood.
- 29.6 Where the conditions in clauses 30.1 to 30.4 cannot be observed the Electrical Officer (Contracts), shall be notified. He will arrange for suitable Safety measures to be taken. The Electrical Officer (Contracts), may in his discretion and in appropriate circumstances, arrange for a suitable employee of the Contractor to be specially trained by the network operator and at the Contractor's cost, as an Authorised Person to work closer than 3 metres from "live" overhead conductors and under such conditions as may be imposed by the senior responsible electrical engineer of the network operator.

30.0 USE OF EQUIPMENT

30.1 Measuring Tapes and Devices

- 30.1.1 Measuring tapes may be used near "live" high-voltage equipment provided that no part of any tape or a person's body comes within 3 metres of the "live" equipment.
- 30.1.2 In windy conditions the distance shall be increased to ensure that if the tape should fall it will not be blown nearer than 3 metres from the "live" high-voltage equipment.
- 30.1.3 Special measuring devices longer than 2 metres such as survey sticks and rods may be used if these are of non-conducting material and approved by the responsible Electrical Engineer of the network operator, but these devices must not be used within 3 metres of "live" high-voltage equipment in rainy or wet conditions.
- 30.1.4 The assistance of the Electrical Officer (Contracts) shall be requested when measurements within the limits defined in clauses 31.1.1 to 31.1.3 are required.
- 30.1.5 The restrictions described in 31.1.1 to 31.1.3 do not apply on a bridge deck between permanent parapets nor in other situations where a barrier effectively prevents contact with the "live" high-voltage equipment.

30.2 Portable Ladders

- 30.2.1 Any type of portable ladder longer than 2 metres may only be used near "live" high-voltage equipment under the direct supervision of the Responsible Representative. He shall ensure that the ladder is always used in such a manner that the distance from the base of the ladder to any "live" high-voltage equipment is greater than the fully extended length of the ladder plus 3 metres. Where these conditions cannot be observed, the Electrical Officer (Contracts) shall be advised, and he will arrange for suitable safety measures to be taken.

31.0 CARRYING AND HANDLING MATERIAL AND EQUIPMENT

- 31.1 Pipes, scaffolding, iron sheets, reinforcing bars and other material which exceeds 2 metres in length shall be carried completely below head height near "live" high-voltage equipment. For maximum safety such material should be carried by two or more persons so as to maintain it as nearly as possible in a horizontal position. The utmost care must be taken to ensure that no part of the material comes within 3 metres of any "live" high-voltage equipment.
- 31.2 Long lengths of wire or cable shall never be run out in conditions where a part of a wire or cable can come within 3 metres of any "live" high-voltage equipment unless the Electrical Officer (Contracts) has been advised and has approved appropriate safety precautions.
- 31.3 The presence of overhead power lines shall always be taken account of especially when communications lines or cables or aerial cables, stay wires, etc. are being erected above ground level.

32.0 PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE, TREES ETC.

- 32.1 A pole may be handled for the purpose of erection or removal near high-voltage equipment under the following conditions:

(i) If the distance between the point at which the pole is to be erected or removed and the nearest "live" high-voltage equipment is more than the length of the pole plus 3 metres, the work shall be supervised by the Responsible Representative.

(ii) If the distance described in (i) is less than the length of the pole plus 3 metres, the Electrical Officer (Contracts) shall be consulted to arrange for an Authorised Person to supervise the work and to ensure that the pole is earthed where possible. The pole shall be kept in contact with the point of erection, and adequate precautions shall be taken to prevent contact with "live" high-voltage equipment.

32.2 The cost of supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

32.3 The provisions of clauses 33.1 and 33.2 shall also apply to the erection or removal of columns, antennae, trees, posts, etc.

33.0 USE OF WATER

33.1 No water shall be used in the form of a jet if it can make contact with any "live" high-voltage equipment or with any person working on such equipment.

34.0 USE OF CONSTRUCTION PLANT

34.1 "Construction plant" entails all types of plant including cranes, piling frames, boring machines, excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

34.2 When work is being undertaken in such a position that it is possible for construction plant or its load to come within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted. He will arrange for an Authorised Person to supervise the work and to ensure that the plant is adequately earthed. The Electrical Officer (Contracts) will decide whether further safety measures are necessary.

34.3 The cost of any supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

34.4 When loads are handled by cranes, non-metallic rope hand lines shall be used, affixed to such loads so as to prevent their swinging and coming within 3 metres of "live" high-voltage equipment.

34.5 Clauses 35.1 to 35.4 shall apply *mutatis mutandis* to the use of maintenance machines of any nature.

35.0 WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT

35.1 If the Responsible Representative finds that the work cannot be done in safety with the high-voltage electrical equipment "live", he shall consult the Electrical Officer (Contracts) who will decide on the action to be taken.

35.2 If a work permit is issued the Responsible Representative shall-

(i) before commencement of work ensure that the limits within which work may be carried out have been explained to him by the Authorised Person who issued the permit to him, and that he fully understands these limits.

(ii) sign portion C of the permit before commencement of work;

(iii) explain to all persons under his control the limits within which work may be carried out, and ensure that they fully understand these limits;

(iv) care for the safety of all persons under his control whilst work is in progress; and

(v) withdraw all personnel under his control from the equipment on completion of the work before he signs portion D of the work permit.

36.0 TRACTION RETURN CIRCUITS IN RAILS

36.1 DANGEROUS CONDITIONS CAN BE CREATED BY REMOVING OR SEVERING ANY BOND.

36.2 Broken rails with an air gap between the ends, and joints at which fishplates are removed under "broken bond" conditions, are potentially lethal. The rails on either side of an air gap between rail ends on electrified lines shall not be touched simultaneously until rendered safe by the network operator personnel.

36.3 The Contractor shall not break any permanent bonds between rails or between rails and any structure. He shall give the Contract Supervisor at least 7 days written notice when removal of such bonds is necessary.

36.4 No work on the track which involves interference with the traction return rail circuit either by cutting or removing the rails, or by removal of bonds shall be done unless the Electrical Officer (Contracts) is consulted. He will take such precautions as may be necessary to ensure continuity of the return circuit before permitting the work to be commenced.

37.0 HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR

Where the work is undertaken on or near high-voltage electrical equipment which is not maintained and/or operated by the network operator, the Occupational Health and Safety Act No. 85 of 1993, and Regulations and Instructions, or the Mines Health and Safety Act (Act 29 of 1996), shall apply.

Such equipment includes:-

- (i) Eskom and municipal equipment;
- (ii) The Contractor's own power supplies; and
- (iii) Electrical equipment being installed but not yet taken over from the Contractor.

END

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

**THIS ISSUE CANCELS
SPECIFICATION NO.:
CEE.0023.86**

SPECIFICATION FOR THE INSTALLATION OF CABLES

This specification covers SpoorNet's requirements for the installation, laying, terminating, jointing, testing and commissioning of the high and low voltage cables.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

INDEX

SECTION	CONTENTS	PAGE NO
1.0	SCOPE	3
2.0	REFERENCE LIST	3
3.0	APPENDICES	4
4.0	DRAWINGS AND INSTRUCTIONS	5
5.0	STANDARD OF WORK	5
6.0	SAFETY INSTRUCTIONS	5
7.0	SURVEYS	5
8.0	EXCAVATIONS	6
9.0	CABLE LAYING	9
10.0	CABLE TERMINATIONS	14
11.0	CABLE JOINTS	15
12.0	COVERING, BACKFILLING AND REINSTATEMENT	17
13.0	MEASUREMENTS	19
14.0	TESTS	19
15.0	GUARANTEE	22

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 1.0 SCOPE
- 1.1 This specification covers Spoornet's requirements for the installation, laying, terminating, jointing, testing and commissioning of high and low voltage cables.
- 2.0 REFERENCE LIST
- The following publications, drawings and documents (latest edition) are referred to herein.
- 2.1 South African Bureau of Standards
- SABS 97 - Impregnated paper insulated electric cables.
- SABS 0142 - Code of practice for the wiring of premises.
- SABS 150 - Polyvinylchloride (PVC) insulated electric cables and flexible cords.
- SABS 763 - Hot-dip (galvanised) zinc coating.
- SABS 1339 - Cross-linked polyethylene insulation of electric cables.
- SABS 1299 - Direct-acting indicating electrical measuring instruments and their accessories.
- 2.2 British Standard Institution
- BS 5467 - Armoured cables with thermosetting insulation for electricity supply.
- BS 6480 - Impregnated paper-insulated cables.
- 2.3 Machinery and Occupational Safety Act, Act No. 6, 1983
- 2.4 Spoornet
- CEE.0012 - Method of Tendering
- CEE.0045 - Painting of steel components of electrical equipment.
- CEE.0089 - Drawings of electrical equipment supplied under electric light and power contracts.
- Safety Instructions - High Voltage Electrical Equipment

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

3.0 APPENDICES

The following appendices form an integral part of this specification.

3.1 Appendix 1 - "Scope of Work"

3.1.1 This appendix specifies the extent of the work required and the order of priorities.

3.2 Appendix 2 - "Drawings".

3.2.1 This appendix lists Spoornets drawings applicable to the installation,

3.2.2 Cable routes indicated on these drawings shall only be a general guide to the contractor.

3.3 Appendix 3 - "Schedule of Items, Estimated Quantities, Unit Rates and Prices".

3.3.1 To ensure a uniform basis for tendering purposes, tenders shall be based on the estimated quantities given in this schedule which shall be completed in full and returned as part of the tender.

Complies/Does not comply

3.3.2 The importance of full completion of this schedule cannot be overstressed as this will constitute the tenderer's quotation.

Complies/Does not comply

3.3.3 Rates specified in this schedule will be applicable if any adjustments to requirements become necessary.

Complies/Does not comply

3.3.4 Any additional items considered to be necessary by the tenderer for the satisfactory completion of the installation and fulfilment of his guarantee shall be added by the tenderer on a similar unit price basis to this schedule and included in his total tendered price.

Complies/Does not comply

3.3.5 Actual quantities required will be based on the final survey by the successful contractor, and payment will be based on the actual measurements.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

4.0 DRAWINGS AND INSTRUCTIONS

4.1 All drawings submitted by the tenderer shall be in accordance with Spoornets Specification No. CEE.0089

Complies/Does not comply

4.2 Where joints and terminations are to be done by others, the contractor shall submit detailed instructions regarding the procedure recommended by the cable manufacturer.

Complies/Does not comply

5.0 STANDARD OF WORK

5.1 The electrical installation shall conform to the requirements of SABS Code of Practice 0142 and shall be to the satisfaction of Spoornet.

Complies/Does not comply

5.2 Galvanising, where specified, shall be in accordance with SABS 763.

Complies/Does not comply

6.0 SAFETY INSTRUCTIONS

6.1 Work on the high voltage equipment shall be carried out in accordance with the Safety Instructions High Voltage Electrical Equipment of Spoornet.

Complies/Does not comply

6.2 All work done must comply with the requirements of the MACHINERY AND OCCUPATIONAL SAFETY ACT, Act No. 6, 1983.

Complies/Does not comply

7.0 SURVEYS

7.1 Pre-installation Route Surveys.

7.1.1 The Contractor shall within 30 days after being awarded the contract, carry out a pre-installation route survey which shall include digging test holes and, guided by the drawings contained in appendix 2, determine a suitable route.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 7.1.2 The contractor shall determine where cables are liable to be subjected to chemical, electrolytic, mechanical or other damage and shall submit his recommendation to the Engineer for approval.

Complies/Does not comply

- 7.1.3 The Contractor shall submit in triplicate plans of the cable routes selected to the Engineer for approval. Plans may be submitted in sections as the survey progresses.

Complies/Does not comply

- 7.1.4 No excavation of any section of the cable route shall commence before the Contractor is in possession of the relevant approved plans and the Engineer has authorised the commencement of work on the section concerned.

Complies/Does not comply

- 7.2 Post Installation Surveys

- 7.2.1 After completion of all cable laying and jointing and before commissioning of any cable the Contractor shall carry out a final "as laid" survey of the cable routes and submit plans on transparencies suitable for reproduction.

Complies/Does not comply

- 7.2.2 The cable route plans shall include the following information :

- 7.2.2.1 Overall length, type, size and voltage of each cable.

- 7.2.2.2 Accurate indication of the position of each cable joint by indicating two distances to each joint from permanent structures.

Complies/Does not comply

- 7.2.2.3 Pipes and chambers provided.

8.0 EXCAVATIONS

- 8.1 Excavations shall be carried out in strict compliance with the specification No. E.7 for works on, over, under or adjacent to a railway line.

Complies/Does not comply

- 8.2 Trenching procedure shall be programmed in advance, approved by the Engineer and shall not be departed from except with the consent of the Engineer.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.3 The Contractor will be advised of any known buried services such as cables, pipes, etc. in the vicinity of the cable route.
- 8.3.1 When trenching the contractor shall take all necessary precautions to prevent damage to underground services.
- Complies/Does not comply
- 8.3.2 On encountering any uncharted service, the Contractor shall promptly advise the Engineer who will give the necessary instructions. Additional excavations shall be paid for at scheduled rates.
- Complies/Does not comply
- 8.4 Should any underground service, water mains, road pavement, drainage system, building or any other structure be damaged by the Contractor's staff, it shall be reported immediately to the Engineer, who shall arrange for the necessary repairs. The Contractor shall be responsible for the cost of repairs.
- Complies/Does not comply
- 8.5 The removal of obstructions along the cable routes shall be subject to the approval of the Engineer and shall be paid for at the agreed rates.
- Complies/Does not comply
- 8.6 The Contractor shall not trench beneath any railway line without departmental supervision. Should the contractor wish to carry out such work, a minimum of 14 working days notice is required by the Engineer to arrange for the necessary supervision. The cost of such supervision shall not be charged to the Contractor.
- Complies/Does not comply
- 8.7 Excavations crossing oil pipe lines shall not commence until an authorised representative is present on site. The Engineer shall be advised 14 days in advance when such excavations will take place.
- Complies/Does not comply
- 8.7.1 Cable crossings of oil pipe lines shall only be at right angles.
- Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.8 Trenches across roads, access ways or foot-paths shall not be left open. If trenching, cable laying and backfilling cannot be done during the same shift, the portion of trench across the full width of the road, etc., must be temporarily backfilled and consolidated sufficiently to carry the traffic concerned without subsidence. Alternatively, adequately strong cover plates shall be laid across the trench.

Complies/Does not comply

- 8.9 Power driven mechanical excavators may be used for trenching operations. SpoorNet shall not be responsible for any damage to other Services in close proximity when using mechanical excavators.

Complies/Does not comply

- 8.10 The Contractor shall provide shuttering in places where the danger exists of the trench collapsing, and causing damage to formations or other nearby structures.

- 8.10.1 Shuttering shall be paid for at scheduled rates.

Complies/Does not comply

- 8.11 Trenches shall be as straight as possible and the bottom of each cable trench shall be firm and of smooth contour without sharp dips or rises which may cause tensile forces in the cable during backfilling.

Complies/Does not comply

- 8.11.1 Trenches shall have no sharp objects which may cause damage to the cable during laying or backfilling.

Complies/Does not comply

- 8.12 The unfinished depth of trenches unless otherwise stated shall be as follows :

- 8.12.1 HV cables and associated pilot cables = 1 000 mm

- 8.12.2 LV cables and separate pilot cables = 750 mm

- 8.13 The width of the trench unless otherwise stated shall be 500 mm for one or two HV cables and associated pilot cables, and shall increase by 300 mm for each additional HV cable and its associated pilot cable.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.13.1 The width of the trench at any bend or places where cable slack is required, shall be such that the bending radius of the cables shall not be less than that specified for the particular cable as per specifications SABS 150, SABS 97 and SABS 1339.

Complies/Does not comply

- 8.13.2 Trenching in railway formations shall be in accordance with Spoornet's Chief Civil Engineer's drawing FG 263.

- 8.14 The material excavated from each trench shall be placed in such a manner as to prevent nuisance or damage to adjacent ditches, railway lines, drains, gateways and other properties and shall not interfere with traffic.

Complies/Does not comply

- 8.14.1 Where, owing to certain considerations, this is not possible the excavated materials shall be removed from site and be returned for refilling the trench on completion of laying.

Complies/Does not comply

- 8.15 When excavating close to railway tracks, the ballast must be covered by tarpaulins or other sheeting to prevent soiling.

Complies/Does not comply

- 8.16 Removal of accumulated water or other liquid from trenches shall be done by the Contractor at his expense. The Contractor shall provide all pumps and appliances required to carry out this operation. Water or any other liquid removed shall be disposed of without creating any nuisance or hazard.

Complies/Does not comply

- 8.17 Spoornet reserves the right to alter any cable route or portion thereof prior to cable laying. Payment in respect of any additional work involved shall be at scheduled rates.

Complies/Does not comply

9.0 CABLE LAYING

9.1 General

- 9.1.1 All possible care shall be exercised in handling cables on site.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.1.2 Any drum of cable showing signs of damage shall not be used.
Complies/Does not comply
- 9.1.3 The outer covering of cables shall not be damaged in any way and cables shall not be bent at radii less than allowed by the manufacturer.
Complies/Does not comply
- 9.1.4 When cable is supplied by the contractor, the drums thereof remain the property of the Contractor and shall be removed from the site and disposed of by him.
Complies/Does not comply
- 9.1.5 Cable pulling and laying shall be done manually unless otherwise approved by the Engineer. No cable shall be subjected to a tension exceeding that stipulated by the cable manufacturer.
- 9.2 IN TRENCHES
- 9.2.1 High Voltage cables shall be spaced at a minimum of 300 mm apart (centre to centre).
- 9.2.2 Low Voltage cables shall be spaced at a minimum of 150 mm apart (centre to centre).
- 9.2.3 Pilot cables shall be laid beside the associated power cables.
- 9.2.4 High Voltage and Low Voltage cables (and pilot cables not associated with High Voltage cable) shall be spaced at a minimum of 300 mm apart.
- 9.2.5 Pilot cables, when they are routed separately from their associated power cables, may be run next to one another.
- 9.2.6 Cables shall not be buried on top of each other except where cable runs cross.
- 9.2.7 Where the cable cannot be laid down at the specified depth, prior authority shall be obtained from the Engineer by the Contractor to protect the cable by means of 150 mm diameter half round concrete pipes with 50 mm concrete slab coverings, or other approved methods.
- 9.2.8 Where cables have to be drawn around corners well lubricated skid plates shall be used. The skid plates shall be securely fixed and constantly examined during cable laying operations.
- 9.2.9 Suitable rollers may be used during the laying of cables.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.2.10 Cables shall be visually inspected for damage during and after laying. Any damage shall be reported immediately to the Engineer who will issue the necessary instructions.

Complies/Does not comply

9.3 IN SLEEVE PIPES

- 9.3.1 All cables crossing beneath roads and pavements shall be enclosed in asbestos cement pipes with a minimum internal diameter of 150mm. The Engineer shall be advised timeously of the locations and quantity of pipes to be laid and chambers to be provided by others. Separate lengths of pipe shall be properly jointed.

Complies/Does not comply

- 9.3.2 Pipes shall maintain or exceed the specified cable spacing.

Complies/Does not comply

- 9.3.3 Only one High Voltage cable shall be laid per pipe.

Complies/Does not comply

- 9.3.4 Pipes shall extend at least 1 m on either side of the road- or pavement formations and shall maintain the specified cable depth. All pipes shall be graded for water drainage : the required grade is 1:400.

Complies/Does not comply

- 9.3.5 All cables crossings underneath railway tracks shall be in pipes in accordance with Chief Civil Engineer's drawing FG 263.

9.4 IN DUCTS AND BUILDINGS

- 9.4.1 Concrete ducts and pipes within buildings will be provided by others.

- 9.4.2 Before installing cables, the ducts are to be inspected to ensure that they are suitable and clean as not to damage the cables.

Complies/Does not comply

- 9.4.3 The cables are to be neatly positioned and cross overs are to be avoided.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.4.4 Steel checker plates over ducts will be supplied by others. The tenderer will however be required to cut all the slots for emerging cables. These slots are to be neatly cut and smoothed to avoid damage to the cable.

Complies/Does not comply

- 9.4.5 The Contractor shall supply all cable trays, racks, wooden cleats or other supports required to adequately support cables not laid in ducts.

Complies/Does not comply

- 9.4.6 Cable trays or racks shall be of reinforced glass fibre or steel suitably treated to prevent corrosion, Steel trays, racks and other supports shall be galvanised in accordance with SABS 763 when used within 50 km of the sea or inland exposed conditions.

Complies/Does not comply

9.5 UNDER BRIDGES AND IN TUNNELS

- 9.5.1 Where a cable route can only be against the concrete wall of a bridge or tunnel the cable shall be supported on :

- 9.5.1.1 suitable brackets at 750 mm intervals.

or

- 9.5.1.2 straining wire secured at maximum 1 200 mm intervals.

Complies/Does not comply

- 9.5.2 Brackets shall be of robust design and shall be galvanised and painted in accordance with specification CEE.0045

Complies/Does not comply

- 9.5.3 The height of the cable route on the brackets or strain wire shall be determined and agreed upon on site.

Complies/Does not comply

- 9.5.4 The brackets or strain wire shall be supplied and installed by the contractor.

Complies/Does not comply

9.6 CROSSING OF PIPELINES AND OTHER CABLES

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.6.1 Cables shall pass beneath pipelines with a 300 mm minimum clearance between the top of any cable and the bottom of any oil pipe.

Complies/Does not comply

- 9.6.1.1 The level of any cable at an oil pipeline crossing shall be maintained for not less than 3 m on either side of the centre line of the pipeline or on either side of the centre line of the outermost pipelines where there is more than one pipeline on the same route.

Complies/Does not comply

- 9.6.2 Where cables cross communication or signal cables, at least 300 mm of fill shall be provided between the two cables. In addition a concrete slab in accordance with Spoornets drawing No. CEE 55/027367 shall be placed between the two cables parallel to the lower cable.

Complies/Does not comply

9.7 IN RAILWAY FORMATIONS

- 9.7.1 Cables to be accommodated in railway formations shall be laid in accordance with Chief Civil Engineer's drawing No. FG 263.

Complies/Does not comply

9.8 SECURED TO POLES

- 9.8.1 Cables to be terminated at disconnectors (isolators) mounted on wood, concrete or steel poles, shall be clamped onto such structures by means of stainless steel straps applied at such a tension that the cable or cable sheath is not damaged. Straps shall be located at intervals of not more than 1,2 m.

Complies/Does not comply

- 9.8.2 Cables shall be protected by a pipe or boxed section of galvanised steel or other approved material for a distance of 250 mm below and 600 mm above ground level, strapped or screwed to the pole at a minimum of two points and connected to the earth connection, if of steel construction.

Complies/Does not comply

- 9.8.3 Straps and pipes shall be supplied and installed by the Contractor.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

9.9 EXPOSED CONDITIONS

- 9.9.1 Whenever cables enter buildings or tunnels, or where excavations are not permitted down banks or cuts, the exposed portion shall be suitably protected by means of concrete slabs, or suitable steel pipes or boxed sections which shall be galvanised in accordance with SABS 763.

Complies/Does not comply

- 9.9.2 These pipes or boxed sections shall be firmly secured to the bank or cut, at regular intervals.

Complies/Does not comply

- 9.9.3 All such material shall be supplied and installed by the Contractor.

Complies/Does not comply

- 9.9.4 Stake routes shall only be supplied when specifically called for in Appendix 1.

10.0 CABLE TERMINATIONS

10.1 General

- 10.1.1 All cables shall be terminated and connected to the respective equipment, whether provided by the Contractor or by others.

Complies/Does not comply

- 10.1.2 Jumpers between cable end boxes and disconnectors shall either be short enough to be rigidly self supporting, or shall be supported on suitably placed pin insulators.

Complies/Does not comply

- 10.1.3 Termination of cables on outdoor equipment shall not be done during inclement weather conditions.

Complies/Does not comply

- 10.1.4 Both ends of each cable shall be identified by means of embossed stainless steel strips clamped around the cables. The characters shall have a minimum height of 6 mm.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 10.1.5 All materials necessary for cable termination shall be provided by the Contractor.
Complies/Does not comply
- 10.1.6 The contractor shall ensure that correct phase rotation is maintained throughout.
- 10.1.7 Glands of cables terminating on equipment provided with frame leakage protection shall be insulated from the frame by high grade non-deteriorating, non-hygroscopic insulation, at least 2 mm thick, capable of withstanding a test voltage of 4 kV DC for one minute.
Complies/Does not comply
- 10.2 HV Cables
- 10.2.1 The cable armouring shall be bonded with an approved copper bond to the cable end box at one end of the cable only as directed by the Engineer. This bond shall be easily removable for testing purposes.
Complies/Does not comply
- 10.2.2 Where for any reason a cable cannot be terminated, sufficient length of cable shall be left to reach the cable end box position. The cable shall be coiled and buried or otherwise protected. The cable end of paper insulated cables shall be capped immediately with a plumbed lead seal. Other cables shall be sealed with suitable tape.
Complies/Does not comply
- 10.3 LV Cables (and Pilot Cables)
- 10.3.1 All cut ends of cables are to be sealed with suitable tape, or other approved means until they are ready to be terminated.
Complies/Does not comply
- 10.3.2 The cables shall terminate in compression type glands, brass or bronze, suitable for PVC SWA ECC cables.
Complies/Does not comply
- 10.3.2.1 The glands shall be fitted with neoprene shrouds.
Complies/Does not comply
- 11.0 CABLE JOINTS
- 11.1 General

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 11.1.1 Jointing shall be carried out strictly in accordance with the manufacturer's jointing instructions and by artisans thoroughly experienced and competent in jointing the classes of cables used. They shall be adequately supervised to ensure the highest quality of workmanship.
Complies/Does not comply
- 11.1.2 Jointing shall not be carried out during inclement weather.
Complies/Does not comply
- 11.1.3 The cores of cables shall be jointed number to number or colour to colour.
Complies/Does not comply
- 11.1.4 The joints shall not impair the anti-electrolysis characteristics of the cables.
Complies/Does not comply
- 11.1.5 The conductor bridging the armouring shall be adequate to carry the prospective earth fault current.
Complies/Does not comply
- 11.1.6 A through joint shall only be permitted after every full drum length of cable.
Complies/Does not comply
- 11.1.7 Each cable joint shall be identified by a non-corrodible label fixed securely to the top of the joint. Each label shall have stamped on it, in characters having a minimum height of 10 mm, the identification of equipment at each end of the cable concerned.
Complies/Does not comply
- 11.1.8 Spoornet reserves the right to be present during jointing operations to familiarise themselves with any special techniques.
Complies/Does not comply
- 11.1.9 No joint shall be situated inside a cable pipe.
Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 12.0 COVERING, BACKFILLING AND REINSTATEMENT
- 12.1 Filling of trenches shall not commence before the Engineer or his authorised representative has inspected and approved the cables and cable joints in situ in the section of trench concerned.
- Complies/Does not comply
- 12.2 Trenches in railway formations shall be backfilled and reinstated in accordance with SpoorNet's Chief Civil Engineer's drawing No. FG 263.
- Complies/Does not comply
- 12.3 All other trenches shall be backfilled and reinstated as follows:
- 12.3.1 Two 75 mm thick layers of soil sifted through a 6 mm mesh shall be laid directly under and over the cables respectively and consolidated by hand ramming only.
- Complies/Does not comply
- 12.3.1.1 Only soil with a thermal resistivity of 1,5 degrees C.m/watt, or lower may be used for this purpose.
- Complies/Does not comply
- 12.3.1.2 When necessary imported fill shall be arranged by the Contractor and paid for at scheduled rates.
- Complies/Does not comply
- 12.3.2 HV cables shall, where likely to be mechanically damaged as decided by the engineer, be protected by concrete slabs (to Drawing No. CEE 55/027367) to be supplied and laid by the Contractor on top of the sifted soil. These slabs shall be laid close-butt, convex end to concave end, directly above each HV cable throughout the underground portion except where otherwise protected as by pipes, etc. Only unbroken cable protection slabs may be used, and only slabs actually laid will be paid for.
- Complies/Does not comply
- 12.3.3 The minimum dry densities of backfilling after compaction shall be not less than 1 600 kg/cubic metre.
- Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 12.3.4 All excavations made (whether for the purpose of cable laying, joint bays or trial holes) shall be back-filled in 150 mm layers, the earth in each layer being well rammed and consolidated and sufficient allowance being made for settlement. The back-filling shall be completed to the satisfaction of the Engineer. If necessary, water shall be used to obtain the specified compacted density. Any cable damaged during backfilling shall be replaced by the Contractor at his own expense.

Complies/Does not comply

- 12.3.4.1 Backfilling at pipe entries shall be such as not to stress or damage the cable during compaction from the top.

- 12.3.5 A continuous plastic cable warning tape, to drawing No. CEE-MA-307 shall be laid directly above each HV cable, 150 mm below the normal surface level and run for the full length of the cable before completing the back-filling.

Complies/Does not comply

- 12.4 The back filled trench shall be maintained in a thoroughly safe condition by the contractor for the duration of the contract.

Complies/Does not comply

- 12.5 All back filling of road crossings shall be mechanically rammed.

Complies/Does not comply

- 12.6 Final surfacing of roads shall be restored by others unless called for under "Scope of Work", Appendix 1.

Complies/Does not comply

- 12.7 Concrete cable route markers shall be provided and installed by the contractor in accordance with drawing CEE-PK-14.

Complies/Does not comply

- 12.8 Pipes shall be filled with a sand/water mixture to also have a thermal resistivity of 1,5 degrees C.m/watt or lower when dry. The sand used in the mixture shall be chemically tested not to be harmful to the cable outer sheath.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

13.0 MEASUREMENTS

13.1 All measurements for payment purposes shall be made jointly by representatives of the Contractor and SpoorNet and shall be agreed upon by both parties. The Contractor shall be responsible for obtaining the Engineer's signed approval of such measurements.

Complies/Does not comply

13.2 Measurements of cable length shall be made from centre to centre of cable joints and to the cable ends and will exclude any wastage due to jointing and terminating.

Complies/Does not comply

13.3 When cable is drawn through pipes, only the portion remaining in the pipe will be paid for at the rates quoted for "as installed in pipes".

Complies/Does not comply

13.4 Determination of trench volume for measurement purposes shall be based on measured length and specified width and depth. No allowance shall be made where trenches have to be widened at the bottom to accommodate cables, cable joints and protection slabs.

Complies/Does not comply

13.5 The classification of different types of ground for measurement purposes shall be as follows:

13.5.1 Soft rock will be taken as broken or friable rock which can be removed by pick or mechanical excavator or paving breaker. This includes hard clay.

13.5.2 Hard rock will be taken as rock which cannot be removed by a mechanical excavator and requires drilling and blasting or splitting. This includes reinforced or plain concrete.

14.0 TESTS

14.1 The costs of all post-installation tests shall be borne by the Contractor.

Complies/Does not comply

14.2 The Contractor shall be responsible for remedial work necessary due to damages caused during tests.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 14.3 Spoornet reserves the right to carry out any further tests deemed necessary, using either the Contractor's instruments and equipment or its own, or both. The costs of such tests will not be charged to the Contractor.

Complies/Does not comply

- 14.4 Test instruments shall be of the accuracy class 1.0 or better in accordance with SABS 1229. Calibration certificates from a recognised testing authority shall be available for inspection and shall not be older than one year.

Complies/Does not comply

- 14.5 Time measurements shall be carried out using an approved digital timer.

Complies/Does not comply

- 14.6 The final commissioning site tests will be carried out by Spoornet.

Complies/Does not comply

- 14.6.1 A suitably qualified staff member of the Contractor shall assist Spoornet during the tests and shall carry out any remedial work where necessary.

Complies/Does not comply

- 14.7 The contractor shall notify the Engineer in writing 4 weeks before the commissioning date and shall have carried out the following site tests before such date :

Complies/Does not comply

- 14.7.1 Prove the continuity and insulation resistance of the multicore pilot cables.

Complies/Does not comply

- 14.7.2 Verify that the insulation level between frame and earth of switchboards fitted with frame leakage protection is not reduced by the installation of the cables.

Complies/Does not comply

- 14.7.3 The following voltage withstand tests on each completed cable run:

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

14.7.3.1 Paper insulated cables:

(i) rating up to 12,7/22 kV : test specified in paragraph D-3 of SABS 97.

Complies/Does not comply

(ii) rating 19/33 kV : test specified in paragraph B-3 of BS 6480, Part 1.

Complies/Does not comply

The extruded PVC impermeable serving shall withstand a test voltage of 10 kV DC between armouring and earth for 1 minute.

Complies/Does not comply

The insulation between armouring and lead sheath shall withstand a test voltage of 10 kV DC for 1 minute.

Complies/Does not comply

14.7.3.2 XLPE Insulated Cables:

All cables rated up to 19/33 kV shall be tested as specified in appendix E, clause 1.4, of SABS 1339, and cables rated up to 1,9/3,3 kV shall be tested as specified in appendix B, clause B.6, of BS 5467.

Complies/Does not comply

Note :

Where a new XLPE cable is to be joined to an existing XLPE Cable, the test shall differ, in that a 4 kV DC test voltage shall be applied for one minute between the brass screens of the cores and the armouring. The outer sheath shall withstand a test voltage of 10 kV DC for 1 minute between the armouring and earth.

Complies/Does not comply

14.7.4 PVC insulated cables shall be tested as specified in paragraph D-3 of SABS 150.

Complies/Does not comply

14.7.5 The Contractor shall submit three copies of certified test reports to the Engineer within three weeks after completion of the tests.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

15.0 GUARANTEE

15.1 All work undertaken by the Contractor shall be subject to a guarantee for a period of one year against faulty and/or inferior workmanship and material.

Complies/Does not comply

15.2 The guarantee period shall commence the day the installation is formally handed over to and accepted by Spoornet.

Complies/Does not comply

15.3 The Contractor shall undertake to repair all faults or defects due to bad workmanship and/or faulty materials, and to replace all defective equipment or materials during the guarantee period.

Complies/Does not comply

15.4 Any defects that may become apparent during the guarantee period shall be rectified to the satisfaction of, and free of cost to Spoornet.

Complies/Does not comply

15.5 The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of his being notified by Spoornet of such defects.

Complies/Does not comply

15.6 Should the Contractor fail to comply with the requirements stipulated above, Spoornet shall be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contractor shall reimburse Spoornet the total cost of such repair or replacement, including the labour costs incurred in replacing defective material.

Complies/Does not comply

TENDERER'S SIGNATURE

DATE

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 1

PAGE 1 OF 1

SCOPE OF WORK

1.0 Site inspection required/not required.

Date :

Time :

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 2

PAGE 1 OF 1

DRAWINGS

DRAWING NO.	TITLE
CEE 55/027367	Concrete slab, cable protection
CEE-PK-14	Route marker, cable, electrical.
CEE-MA-307	Tape, cable warning, underground
FG 263	Accommodation of cables in Railway formations.

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 1 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
1.0	Route surveys (clause 7.0)		complete		
2.0	Excavations in				
a)	Hard rock		/cubic metre		
b)	Soft rock		/cubic metre		
c)	Soil		/cubic metre		
3.0	Transportation of soil		/cubic metre		
4.0	Shuttering (clause 8.10)		/m		
5.0	Concrete slabs supplied and installed (clause 12.3.2)		each		
6.0	Plastic cable warning tape supplied and installed (clause 12.3.5)		/m		
7.0	150 mm dia. half round concrete pipes supplied and installed (clause 9.2.7.)		/m		
8.0	150 mm dia. asbestos cement pipes supplied and installed		/m		
9.0	Cutting of checker plates (clause 9.4.4)		/m cut		
10.0	Backfilling of trenches with soil (clause 12.3)		/cubic metre		
11.0	Backfilling of trenches with 10:1 soil/cement mix (clause 12.2)		/cubic metre		

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 2 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
12.0	Importation of soil		/cubic metre		
13.0	Concrete cable route markers		each		
14.0	Reinstate tarred surface		/cubic metre		
15.0	Reinstate concrete surface		/cubic metre		
16.0	Installation of cables				
16.1	Installed in trenches (Clause 9.2)				
16.1.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
16.1.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
16.2	Installed in sleeve pipes (clause 9.3)				
16.2.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 3 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
16.2.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
16.3	Installed in ducts (clause 9.4)				
16.3.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
16.3.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.0	Installation of cables (Special conditions)				
17.1	Cable supports (clause 9.4.5 and 9.4.6)				
17.1.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 4 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.1.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.2	Securing cables to poles (clause 9.8)				
17.2.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
17.2.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.3	Securing cables to concrete/tunnel walls				
17.3.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 5 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.3.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.4	Installation of cables in track formations				
17.4.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
17.4.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
18.0	Cable terminations complete (Supply material, terminate and connect up).				
18.1	XLPE cable				
18.1.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 6 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
18.1.2	Low Voltage terminations		each		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
18.2	PILC SWA cable				
18.2.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
18.2.2	Low Voltage terminations		each		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
19.0	Cable joints complete (Supply material, terminate and connect up)				
19.1	PVC to PVC		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 7 OF 7

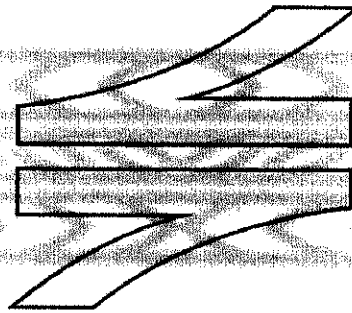
SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
19.2	XLPE to XLPE 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		
19.3	PILC to PILC 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		
19.4	XLPE to PILC 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		

TENDERER'S SIGNATURE

DATE

CHIEF ENGINEER (ELECTRICAL)
(INFRASTRUCTURE)

**SPOORNET**

A division of Transnet limited

TECHNICAL RAILWAY ENGINEERING SPECIFICATION

PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Author: Senior Technologist
Railway Engineering

H.A.Slier

Approved: Senior Engineer
Railway Engineering

L.O.Borchard

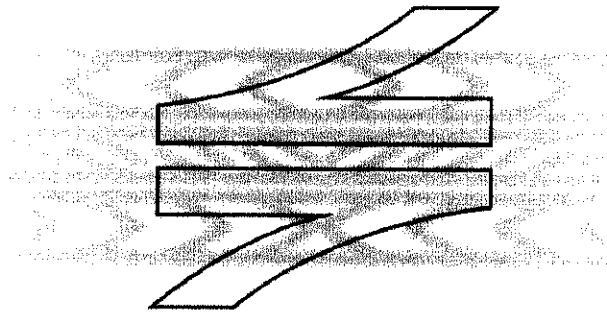
Authorised: Principal Engineer
Locomotive Environment

W.A.Coetzee

Date: 27 February 2002

Circulation restricted to:
Technical: Maintenance (Infrastructure)
Technical: Maintenance

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.



SPOORNET

A division of Transnet limited

**TECHNICAL
RAILWAY ENGINEERING
SPECIFICATION**

**PAINTING OF STEEL COMPONENTS OF
ELECTRICAL EQUIPMENT**

Circulation restricted to:

Technical: Maintenance (Infrastructure)

Technical: Maintenance

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

INDEX

SECTION	CONTENTS	PAGE
1.0	SCOPE	3
2.0	REFERENCES	3
3.0	METHOD OF TENDERING	3
4.0	SURFACE PREPARATION	3
5.0	PRODUCT APPLICATION	5
6.0	PAINT SYSTEMS	7
7.0	COATINGS AND WORKMANSHIP	7

1.0 SCOPE

This specification covers the surface preparation, paint systems and painting of steel components of electrical equipment.

2.0 REFERENCES AND GLOSSARY

The following standards and specifications are referred to herein:

2.1 South African Bureau of Standards: -

SABS 064 : Code of Practice for the Preparation of Steel Surfaces for Coating.

SABS 1091 : National Colour Standards for Paint.

2.2 Trade names :

OptiDegreaser

OptiPrime^{Aqua}

Noxyde

2.3 Classification of level of surface degradation:

RE1 – 0.05% of surface rusted

RE2 – 0.5% of surface rusted

RE3 – 1.0% of surface rusted

RE4 – 3.0% of surface rusted

RE5 – 8.0% of surface rusted

3.0 METHOD OF TENDERING

3.1 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance. Tenderers to elaborate on their response to a clause can use this document.

4.0 SURFACE PREPARATION

4.1 NON-GALVANISED STEELWORK

4.1.1 New Steelwork

SURFACE PREPARATION (Read: NOTES and SPECIAL INSTRUCTIONS)	PRODUCT REQUIREMENTS & APPLICATION (See Variations for Specific Environmental Conditions)
<ul style="list-style-type: none"> ➤ Sandblast to a standard of Sa2 to remove mill scale and/or flash rust ➤ Remove dust with <u>clean</u> compressed air (Check air for oil contamination) 	<ul style="list-style-type: none"> ➤ Apply a stripe coat to edges, bolts, crevices, nuts and rivets. ➤ Apply one thick coat of Noxyde to the entire structure with contrasting color. ➤ Apply a final thick coat of Noxyde at a consumption rate of minimum 400g/m²

4.1.2 Previously Coated Steelwork

4.1.2.1 COATING START FAILING TO A LEVEL OF RE 2

<ul style="list-style-type: none"> ➤ Test for adhesion (refer to supplier) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle 	<ul style="list-style-type: none"> ➤ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices. ➤ Apply one coat of Noxyde to entire substrate in a contrasting color
---	--

4.1.2.2 COATING FAILURE AND RUSTING TO A LEVEL OF RE 4

<ul style="list-style-type: none"> ➤ Remove all visible traces of rust by mechanical means ST2 (chip/grind/sand) OR shotblasting /spotblasting) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle. 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply one coat of Noxyde at a consumption rate of minimum 400g/m² to the entire substrate using a contrasting color.
---	---

4.1.2.3 BITUMEN COATED

<ul style="list-style-type: none"> ➤ Remove all visible rust and loosely adhering bitumen coating by means of chipping and scraping (ST2) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle. 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply two coats of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using contrasting colors
---	---

4.1.2.4 BADLY RUSTED STEEL WITH PITTING & CRUST FORMATION TO RE 5

<ul style="list-style-type: none"> ➤ 1.Degrease thoroughly with OptiDegreaser ➤ 2.Hydro Blast complete substrate using a spinner tip and minimum 250 bar at the nozzle ➤ Shotblast/sandblast complete substrate giving particular attention to bolts nuts rivets and crevices. Sa2 ➤ 4.Dedust 	<ul style="list-style-type: none"> ➤ Apply a first thick coat of Noxyde to the entire substrate ➤ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices using a contrasting color ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m²
---	--

4.2 GALVANISED STEELWORK

4.2.1 NEW AND WEATHERED GALVANISING WITH A SMOOTH GLOSSY FINISH

<ul style="list-style-type: none"> ➤ Degrease thoroughly with OptiDegreaser ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply one thin coat of OptiPrime^{Aqua} (100 micron wet/35 micron dry) ➤ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➤ Apply two coats of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using contrasting colors
---	---

4.2.2 WEATHERED GALVANISING

4.2.2.1 White rust (zinc oxide)

<ul style="list-style-type: none"> ➤ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply one thin coat Noxyde ➤ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using a contrasting color
---	---

4.2.2.2 Combination of red rust (iron oxide) and white rust (zinc oxide)

<ul style="list-style-type: none"> ➤ Remove all traces of red rust ➤ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using a contrasting color
--	---

NOTES and SPECIAL INSTRUCTIONS:		
1 Sand or Grit-blasting a) Always use clean, non-recycled grit b) Always use fine or extra fine grit c) Always use oil free air d) Always use a moisture trap e) Dedust	2 Degreasing: a) Use only OptiDegreaser b) Dilute according to instructions – see data sheet c) Always follow up with hydro-blasting to remove all chemical residues	3 Hydro-blasting: a) Always use clean potable water b) Use a rotating nozzle and ensure a pressure of minimum 250 bar at the nozzle c) Remove ALL traces of dirt and any form of salt contamination and residues of the degreasing agent d) Concentrate in crevices and other similar "collection" areas

5. PRODUCT APPLICATION

5.1 METHOD OF APPLICATION

OptiPrime ^{Aqua}	Noxyde
Temperature-Min 5 °C Relative humidity-Max 80% R.H. <ul style="list-style-type: none"> ➤ Apply by brush, lacquer roller or airless spray using a no. 11 nozzle ➤ Apply one thin coat only - 100 micron wet = 35 micron dry (DFT) ➤ Small parts can be dipped - dilute with 10% water for dipping 	Temperature-Min. 8 °C, Max. 55 °C Relative Humidity-Max 80% R.H. <ul style="list-style-type: none"> ➤ Apply by brush, roller or airless spray ➤ For airless spray applications refer to "Tips for airless spraying of Noxyde"

5.2 DRYING TIME AND OVERCOAT PERIODS

<ul style="list-style-type: none"> ➤ Do not overcoat within 12 hours ➤ Wash down with clean potable water (100 bar) before over coating to remove dust or any other form of intermediate contamination 	<ul style="list-style-type: none"> ➤ Drying time is dependant on ambient conditions and can vary from a few minutes (in dry windy conditions) to a few hours (in humid shaded conditions) ➤ Overcoat as soon as possible to avoid contamination of previous coat ➤ Wash down with clean potable water (100 - 150 bar) before over coating if danger of contamination exists or if left more than 4 hours before over coating
--	---

5.3 CURING TIME

n/a	<ul style="list-style-type: none"> ➤ 7 - 14 days to "full cure". During this period the product is prone to mechanical damage - the longer time it is allowed to cure, the tougher it becomes
-----	--

5.4 DRY FILM THICKNESS (DFT) READINGS

35 micron	<ul style="list-style-type: none"> ➤ Severe coastal & marine environments (in the spray zone) - TWO stripe coats & overall minimum DFT of 400 micron ➤ Normal coastal environment (1 5 km from the coast line) - a single stripe coat & overall minimum DFT of 400 micron ➤ Non coastal high rainfall areas, in the immediate vicinities of rivers, dams, lakes, etc., and in industrial areas with high levels of chemical pollution - a single stripe coat & overall minimum DFT of 400 micron ➤ Dry non aggressive environments - a single stripe coat & overall minimum DFT of 250 micron <p>NOTE: DFT readings can only be taken after 72 hours</p>
-----------	--

5.5 Notwithstanding the above requirements, all surfaces shall be cleaned according to the appropriate method described in SABS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.

5.6 Blast cleaning of components shall be in accordance with clause 4.3 of SABS 064 to a degree of cleanliness of at least Sa 2 for inland exposure components and Sa 2 ½ for coastal exposure components. See Table 1 of SABS 064 for the appropriate profile.

5.7 Sheet metal that cannot be blast cleaned shall be cleaned by pickling according to clause 4.6 of SABS 064.

5.8 Components that will be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SABS 064 to a medium weight classification of table 2 of that specification.

5.9 Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SABS 064.

6.0 PAINT SYSTEM

A choice of two systems is available to suit the contractors equipment.

6.1 Noxyde paint system

1st coat: OptiPrime^{Aqua}

Wet film thickness: 100 micrometers. Dry film thickness: 35 micrometers.

2nd coat: Noxyde Topcoat

Dry film thickness: 165 micrometers @ 400g/m².

6.1.1 Paint application:

6.1.1.1 The primer and paint is normally applied by brush at supply viscosity (no reducer required).

6.1.1.2 The practical spreading rate of the primer and paint is a function of the ambient temperature, wind velocity and the application technique, but will generally fall in the range of 400g/m² in low to mild corrosive areas, and 500g/m² in severely corrosive areas.

6.1.1.3 Once the applied coat of primer/paint is touch dry, the next coat of paint may be applied.

6.1.1.4 If painted steelwork is to be bolted onto structures, it is imperative that the paint has been allowed to hard dry before the steelwork is bolted onto structures. This is to prevent the soft paint being damaged when tightening the bolts securing the steelwork to the structures.

6.2 Powder Coating System.

The powder-coating process shall be in accordance with SABS 1274 type 4: Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coatings.

7.0 COATINGS AND WORKMANSHIP

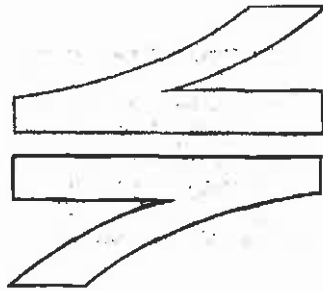
7.1 All specified coatings shall be applied according to the relevant specification and the manufacturer's instructions shall be followed.

7.2 Coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.

7.3 When examined visually, the finished products shall have a uniform appearance and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

TENDERER'S SIGNATURE.....

DATE.....



SPOORNET

A division of Transnet limited

**TECHNICAL
CONFIGURATION MANAGEMENT
SPECIFICATION CONTROL PAGE**

**DRAWINGS, CATALOGUES, INSTRUCTION MANUALS
AND SPARES LISTS FOR ELECTRICAL EQUIPMENT
SUPPLIED UNDER CONTRACT**

Statement of authorisation:

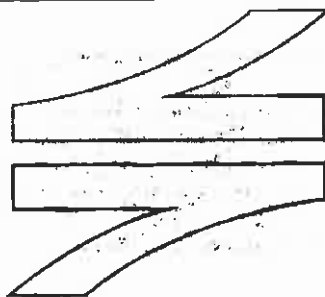
There is no SABS specification available for similar material / equipment and as far as can be ascertained no other specification / standard suitably covers Spoornet requirements. The specification has been compiled in a manner which shall favour / encourage local manufacture of material / equipment to a maximum degree.

Author:	Chief Engineering Technician Documentation management	J C van Tonder
Approved:	Senior Engineer Railway Engineering	L O Borchard
Authorised:	Senior Technologist Configuration Management	J H Hancock

[Signatures]

Date: January 2002

This page is for control purposes only and shall not be issued with the specification.



SPOORNET

A division of Transnet limited

**TECHNICAL
CONFIGURATION MANAGEMENT**

SPECIFICATION

**DRAWINGS, CATALOGUES, INSTRUCTION MANUALS
AND SPARES LISTS FOR ELECTRICAL EQUIPMENT
SUPPLIED UNDER CONTRACT**

Circulation restricted to:

Technical

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

INDEX

SECTION	CONTENTS	PAGE NO
1.0	SCOPE	3
2.0	DEFINITIONS	3
3.0	STANDARDS AND SPECIFICATIONS	3
4.0	APPENDIX	3
5.0	METHOD OF TENDERING	3
6.0	LANGUAGE AND UNITS OF MEASURE	4
7.0	DRAWINGS	4
8.0	INFORMATION REQUIRED ON DRAWINGS	5
9.0	CERTIFICATION OF DRAWINGS	8
10.0	CHANGES TO DRAWINGS	8
11.0	SUBMISSION OF TENDER DRAWINGS	8
12.0	DRAWINGS TO BE SUPPLIED BY SUCCESSFUL TENDERER	8
13.0	CATALOGUES	9
14.0	INSTRUCTION MANUALS	10
15.0	COMBINED DOCUMENT	11
16.0	SPARES LISTS	11
17.0	PACKING OF DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS	11
18.0	SUBSTITUTION	11

1.0 SCOPE

This specification covers Spoornet's requirements for drawings, catalogues, and instruction manuals and spares lists of electrical equipment supplied under contract.

2.0 DEFINITIONS

- 2.1 "Design drawings for approval" defines those drawings, which have to be submitted to Spoornet for approval prior to manufacture of equipment.
- 2.2 "Installation drawings" defines those drawings, which are required for the installation of the equipment.
- 2.3 "As Built drawings" defines those drawings, which reflect all the various approved designs, layouts, etc., of the actual final accepted state of the equipment.

3.0 STANDARDS AND SPECIFICATIONS

- 3.1 The following standards and specifications are referred to:

CEE.0012: Method of Tendering

SABS 0111: Engineering Drawings.

BS 308: Engineering Drawing Practice.

NRS 002: Graphical Symbols for Electrical Diagrams.

IEC 617: Graphical Symbols for Diagrams.

ASHRAE: American Society of Heating Refrigeration Air-conditioning Engineers Standard.

- 3.1.1 The following Spoornet standard (Electrical) symbol drawings are listed for reference:

CEE-PA-19: Symbols for Electrical Installations.

CEE-PA-42: Symbols for Distribution and Transmission Layout.

CEE-PA-101: Symbols for Air-conditioning installations.

CEE-TA-62: Standard Electrification Symbols.

- 3.2 Tenderers and contractors shall ensure that they work to the latest issues and amendments of the above standards and specifications.

4.0 APPENDIX

The following appendix forms an integral part of this specification:

Appendix 1: SCHEDULE OF REQUIREMENTS

This appendix calls for specific requirements applicable to the contract.

5.0 METHOD OF TENDERING

- 5.1 Tendering shall be in accordance with Spoornet (Electrical) specification CEE.0012.

- 5.2 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance.
- 5.3 The Schedule of Requirements, Quantities and Prices, Appendix 1 to this specification shall be fully completed by Tenderers. Failure to submit a fully completed sheet may preclude a tender from further consideration.
- 6.0 LANGUAGE AND UNITS OF MEASURE**
- Drawings and documents shall be prepared in English and the ISO unit of measure. Other offers will be considered on merit.
- 7.0 DRAWINGS**
- 7.1 Drawings shall be generated in either Microstation or any CAD format, which can be read by Microstation, but offers on other media will be considered on merit.
- 7.2 Drawings shall be prepared in such a manner that they fully comply with the requirements of SABS 0111 and/or BS 308.
- 7.3 Symbols, with their explanations used on the drawings but not covered by the NRS 002, IEC 617, ASHRAE or Spoornet's symbol drawings shall be furnished i.e. then included on the drawing or supplied on a separate symbol list which is to be cross referenced to the drawing.
- 7.4 Where the publications referred to in clause 3.1 are at variance, the practice detailed in SABS 0111 shall take preference.
- 7.5 Drawings shall be prepared for ISO; "A" series size sheets and shall not be greater than A1 size except as detailed below.
- 7.5.1 Where under exceptional circumstances the nature of the work is such that a size A1 is impractical, then the A0 size may be used.
- 7.5.2 Long drawings, where necessary for wiring/circuit diagrams, cable run diagrams, track layouts, etc., shall be prepared with widths equal to the widths of the "A" series sheets as required, but preferably not exceeding the length of an A0 sheet.
- 7.6 All interrelated drawings shall be clearly and adequately cross-referenced.
- 7.7 The Contractor hereby grants to Transnet a non-exclusive licence, in accordance with the provisions of section 22 of the Copyright Act, 1978;
- 7.7.1 to copy any plan, diagram, drawing, specification, bill of quantities, design calculation or other similar document made by the Contractor, other than under the direction or control of Transnet, in connection with the extent of work;
- 7.7.2 to make free and unrestricted use thereof for its own purposes;
- 7.7.3 to provide copies thereof to consultants to Transnet to be used by them for the purpose of such consultations and consulting services and-
- 7.7.4 to provide other parties with copies thereof for the purpose of tenders invited by Transnet.

- 7.7.5 Such non-exclusive licence shall apply *mutatis mutandis* to any plan, diagram, drawing, specification, bill and/or schedule of quantities, design calculation or other similar document made, other than under the direction or control of Transnet, by any principal or sub-contractor of the Contractor. The provisions of this clause shall not apply to documents made, in the case of plant or equipment to be supplied, for the manufacturing process of such equipment, but only to the equipment supplied itself.
- 7.7.6 Transnet shall make no separate or extra payment in respect of any non-exclusive licence granted in terms hereof.
- 8.0 INFORMATION REQUIRED ON DRAWINGS**
- 8.1 A title block shall be provided in the lower right hand corner of each drawing, indicating:
- 8.1.1 Descriptive title.
- 8.1.2 Contractor's drawing number.
- 8.1.3 Space for Spoornet's drawing number (as requested in clause 7.7).
- 8.1.4 Place of installation.
- 8.1.5 Contract / Order number.
- 8.1.6 Contractor's name.
- 8.1.7 Signature or name of approving officer (as requested in clause 8.0).
- 8.1.8 Approval date.
- 8.1.9 Issue number.
- 8.1.10 Projection symbol for multi-view drawings, if required.
- 8.2 Successful Tenderers can obtain a copy of Spoornet's standard title block (Microstation or DXF formats) free of charge by contacting the Documentation Management section.
- 8.3 On wiring and circuit diagrams, the following shall be specified:
- 8.3.1 Cable and wire sizes.
- 8.3.2 Values of resistance.
- 8.3.3 Breaking capacity of switches.
- 8.3.4 Ratings of equipment.
- 8.4 On each assembly or sub-assembly drawing, the following shall be given:
- 8.4.1 Description of item.
- 8.4.2 Quantity required for assembly depicted.
- 8.4.3 Material manufactured from.
- 8.4.4 The classification of the material according to the relevant SABS specification or other specifications referred to herein.

-
- 8.4.5 The class or process of finish and/or coating.
 - 8.4.6 Where special parts are specified, the name of the manufacturer, the size, capacity and the name or catalogue number of each part shall be furnished.
 - 8.4.7 The mass of finished item depicted on the drawing.
 - 8.4.8 Dimensions from a proper reference surface.
 - 8.4.9 Dimension tolerances.
 - 8.5 *On electrification drawings, the following shall be specified:*
 - 8.5.1 Kilometre distances.
 - 8.5.1.1 Kilometre distances of all new and existing masts measured from the preceding kilometre post.
 - 8.5.2 Civil
 - 8.5.2.1 The following civil information shall be shown:
 - 8.5.2.1.1 Bridges.
 - 8.5.2.1.2 Tunnels.
 - 8.5.2.1.3 Pipes.
 - 8.5.2.1.4 Culverts.
 - 8.5.2.1.5 Subways.
 - 8.5.2.1.6 Manholes.
 - 8.5.2.1.7 Off track platforms.
 - 8.5.2.1.8 Water-furrows along track.
 - 8.5.2.1.9 Service roads that may influence electrification.
 - 8.5.2.1.10 Level crossings.
 - 8.5.2.1.11 All banks and cuttings.
 - 8.5.2.1.12 Retaining walls.
 - 8.5.2.1.13 Gradient markers and gradients.
 - 8.5.2.1.14 Boundary fences (where relevant).
 - 8.5.2.1.15 The beginning and ending of transition and circular curves and the radius.
 - 8.5.2.3 On all station plans the beginning and ending of the platforms to be indicated, as well as all buildings and structures on the platform which may effect electrification. All secondary platforms/structures/obstacles, which may effect electrification, must also be shown.
 - 8.5.2.4 All points with stock rail joints, intersection of centre lines and all ends of point positions to be shown, as well as the type of point, e.g. 1:9 LH (left hand).
-

-
- 8.5.3 Electrical
- 8.5.3.1 The following electrical information shall be shown:
- 8.5.3.1.1 New and existing masts and structures with appropriate sizes.
- 8.5.3.1.2 Span lengths.
- 8.5.3.1.3 Tension lengths.
- 8.5.3.1.4 Mast to track centres.
- 8.5.3.1.5 Tension type (spring or weight).
- 8.5.3.1.6 Transmission lines, Transnet and Eskom (Showing crossing heights above rail level).
- 8.5.3.1.7 Telkom lines.
- 8.5.3.1.8 Height gauges.
- 8.5.3.1.9 Power and Lighting kiosks.
- 8.5.3.1.10 Electrical cables nearer than 3,2m from track centre, as well as cables crossing the track.
- 8.5.3.2 Wire profiles showing clearances/wire heights for all transmission and telecommunication lines that cross the tracks shall be shown on the drawing at the point of crossing, in either tabular or graphic format.
- 8.5.3.3 *Wire profile for all bridges and tunnels shall be shown on separate drawings.*
- 8.5.3.4 Important information that shall be noted are:
- 8.5.3.4.1 Basic span.
- 8.5.3.4.2 Ruling contact wire height.
- 8.5.3.4.3 Reference to bonding drawings.
- 8.5.3.4.4 Wire sizes.
- 8.5.3.4.5 Types of structures and foundations.
- 8.5.3.4.6 Tables for traction and transmission line (Showing wire heights).
- 8.5.3.4.7 Dropper chart.
- 8.5.3.4.8 Overlaps.
- 8.5.3.4.9 Jumpers.
- 8.5.3.4.10 Staggering.
- 8.5.3.4.11 References to switching diagram drawings.
- 8.5.3.4.12 Any other relevant Information.
- 8.5.4 Signal.
- 8.5.4.1 The following signal information shall be shown:
-

-
- 8.5.4.1.1 Signal gantries (showing direction of aim).
 - 8.5.4.1.2 Independent signals (showing direction of aim).
 - 8.5.4.1.3 Signal kiosks.
 - 8.5.4.1.4 Telephones.
 - 8.5.4.1.5 Signal relay rooms.
 - 8.5.4.1.6 Radio repeater rooms.
 - 8.5.4.1.7 Signal cables nearer than 3,2m from track centre, as well as cables crossing the track.
 - 8.5.5 Electrification information must be clearly indicated on drawings (see also drg no CEE-TA-62 for Standard Electrification Symbols).
 - 8.7 The successful tenderer shall obtain Spoornet's drawing numbers from the Documentation Management section of Spoornet well in advance in writing, wherein details of all relevant drawings, i.e. titles and makers numbers are quoted. Against this information Spoornet will allocate its own numbers for inclusion by the Contractor on the original drawings.
 - 9.0 CERTIFICATION OF DRAWINGS**
The contractor against a date to certify that the drawing has been checked and is correct in all respects shall approve each drawing. This also includes changes.
 - 10.0 CHANGES TO DRAWINGS**
Any drawing returned to the Contractor for changes shall be re-submitted to Spoornet within 21 days with the appropriate changes endorsed thereon.
 - 11.0 SUBMISSION OF TENDER DRAWINGS**
The Tenderer shall submit drawings of all major items of equipment with the tender. The drawings shall be sufficiently detailed (e.g. safety factors) to enable suitability of the design to be judged and to enable Spoornet to prepare a reasonably accurate estimate of the cost of maintenance.
 - 12.0 DRAWINGS TO BE SUPPLIED BY SUCCESSFUL TENDERER**
 - 12.1 Two prints of each design drawing for approval to be submitted prior to commencement of work or manufacture of any equipment to Spoornet. This includes drawings of general layouts, cable routes, schematic diagrams, foundations, equipment etc.
 - 12.2 Two prints of each installation and/or erection drawing to be submitted to Spoornet. This includes drawings of modular steel buildings, structures etc. and shall be delivered at the same time the delivery of the equipment commences.
 - 12.3 The successful tenderer shall supply one complete set of approved (signed) "As Built" working drawings as well as the electronic files thereof. Drawings shall be fully dimensioned, fully detailed, clear and neat. The set shall comprise all electrical and mechanical drawings considered necessary by Spoornet and shall include drawings of all renewable parts or items. "As Built" drawings of all enclosures, structures and foundations shall also be supplied.
-

-
- 12.4 All relevant "As Built" drawings required shall be delivered to Spornet within 90 days of completion of the installation and delivery of equipment.
- 12.5 Until all relevant drawings called for in the contract are delivered, the contract will be considered incomplete.
- 13.0 CATALOGUES**
- 13.1 Tenderers shall submit a separate quotation for the supply of the itemised part catalogues when specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).
- 13.2 The information contained in the catalogues shall be classified into convenient sectors and be indexed. Thumb tabs shall be provided for quick reference to sections. All apparatus shall be illustrated by means of photographs or detailed sketches on which both the parts and the catalogue numbers of the parts are clearly shown. Catalogues shall have exploded views of components for clarity where needed.
- 13.3 The following information shall be given in tabular form:
- 13.3.1 Designation of apparatus or item of equipment.
- 13.3.2 Description of part including information such as dimensions, sizes, resistance values, stranding, material, current ratings, etc.
- 13.3.3 Catalogue number.
- 13.3.4 Manufacturer's name.
- 13.3.5 "As Built" drawing and item number where applicable.
- 13.3.6 Quantity of parts required for each piece of apparatus.
- 13.3.7 Illustrating photographs or sketch number.
- 13.3.8 Nato registration where applicable.
- 13.4 In a suitable section of the catalogue the following information shall be given:
- 13.4.1 Index to "As Built" Drawings.
- 13.4.1.1 "As Built" drawing number.
- 13.4.1.2 Heading.
- 13.4.1.3 Parts shown on drawing.
- 13.4.2 Index to catalogue numbers.
- 13.4.2.1 Catalogue numbers in numerical order.
- 13.4.2.2 Catalogue volume number, where applicable.
- 13.4.2.3 Section in which part is listed.
- 13.4.2.4 Page number.
-

-
- 13.4.3 Special tools.
- 13.4.3.1 Designation and description of special tools.
- 13.4.3.2 Catalogue number.
- 13.5 Each volume shall be neatly bound in hard serviceable cover on which the contract numbers volume number and titles are printed. All the information in the catalogues shall be given in a clear legible manner. The catalogues shall include all items of equipment to be supplied by the successful tenderer.
- 13.6 *Catalogues shall be delivered before date of completion of the contract.*
- 14.0 INSTRUCTION MANUALS**
- 14.1 Tenderers shall submit a separate quotation for the supply of the number of copies of instruction manuals specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).
- 14.2 The successful tenderer shall submit draft instruction manuals for approval prior to final printing/compiling and delivery.
- 14.3 The approved instruction manuals shall be delivered before commissioning the equipment. If this cannot be met, the successful tenderer shall furnish at least three copies of preliminary instruction manuals, suitable for the use of maintenance staff, until the final instruction manuals are to hand (which shall be before the date of completion of the contract).
- 14.4 The construction, method of operation and purpose of all items of equipment shall be fully explained by means of descriptions and photographs, sketches, drawings or circuit diagrams showing all details.
- 14.5 The information contained in the instruction manuals shall be classified into convenient sections and indexed. Where multiple models are produced each model shall be described in a separate section in such a manner that models not applicable can be omitted. Where possible the sections shall be subdivided as follows:
- 14.5.1 Installation and commissioning.
- 14.5.2 General description and method of operation.
- 14.5.3 Maintenance and inspection.
- 14.5.4 Overhaul and repair of equipment.
- 14.5.5 Technical and maintenance data.
- 14.5.6 Test procedure flow charts.
- 14.5.7 Fault finding and trouble shooting.
- 14.6 The method of calibrating, setting or adjusting all equipment requiring such attention shall be described and where necessary illustrated. The necessary data shall be given in each case to enable the equipment to be checked by measurement if required.
-

14.7 Full step-by-step instructions regarding the servicing and repair of the equipment shall be given together with all the necessary data such as dismantling and assembling procedures, working clearances, tolerances, limits, fits, maximum permissible wear, recommended lubricants, use of special tools, insulation and winding data, spring pressures and tensions, brush data, fuse data, etc. Recommended servicing/rework/replacement of parts frequencies shall also be included in the maintenance and inspection section of the instruction manual.

14.8 Any delay in delivery of the complete supply of satisfactory instruction manuals/preliminary manuals as provided for in this clause, will subject the Contractors to a deduction from the contract sum, of a penalty as defined in the tender, counting from the specified delivery time until such time as the said manuals are delivered.

15.0 COMBINED DOCUMENTS

If desired the catalogues and instruction manuals specified in clauses 12.0 and 13.0 may be combined into single volumes. Tenderers shall state whether or not it is their intention to do so. In this case the delivery shall be as specified in clause 13.3, alternatively the conditions described in clause 13.8 applies.

16.0 SPARES LIST

16.1 To enable Spoornet to catalogue and timeously acquire all spares required, the following information shall be submitted before commissioning of equipment:

16.1.1 An itemised schedule of the spares (with reference to alternatives) which are recommended for normal maintenance purposes.

16.1.2 The quantity recommended to be held against each item on the spares list and where sets are supplied, the types and quantity per type to make up a set.

16.1.3 A full and complete ordering description and number of each individual spare with drawing number if relevant.

16.1.4 Where the ordering description and number differs from that of the original manufacturer's catalogue, description and number, the original manufacturer's name, description, type and ordering number shall be listed as well as all other relevant data available.

16.1.5 The national stock number - Nato - number of each spare where the particular spare was imported from a Nato country and where a national stock number was allocated.

16.2 Initially the spares list containing the above information will suffice, but this list shall not in any way replace or supersede the spare parts catalogue mentioned in clause 12.0.

17.0 PACKING OF DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS

All items shall be packed in such a way that they are received in good condition.

18.0 SUBSTITUTION

This specification replaces specification CEE.0224.94

TENDERER'S SIGNATURE: _____

DATE: _____

FOR SPOORNET: _____

GRADE: _____

END

"Preview Copy Only"

Appendix 1

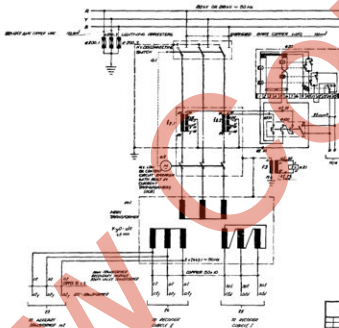
SCHEDULE OF REQUIREMENTS

- 1.1 Sets of maintenance and instruction manuals, wiring diagrams, quality assurance test and quality control sheets complete with 'as built drawings' of the equipment installed shall be provided by the Contractor. Results of measurements
- 1.1.1 For the substation:-
- One set of documentation consisting of specific information for that substation.
- 1.1.2 For the depot:-
- Two sets of documentation consisting of generic information per equipment type.
 - Two sets of documentation consisting of specific information per substation in the depot area.
- 1.1.3 For head office:-
- One set of documentation consisting of generic information per equipment type.
 - One set of documentation consisting of specific information per substation in this contract.
- 1.2 One copy of the documentation containing generic and specific information must be available at the commissioning and handing over of equipment.

FOR SPOORNET: _____

GRADE: _____

.....END.....

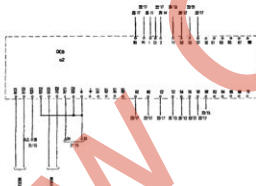
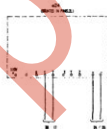
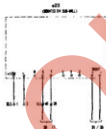
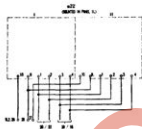


1. THIS BRANCH IS TO BE PAID IN CONNECTION WITH
RELEVANT CHARGES.
SMA-4000-B SHEET 1
3 OF NORTH 47-10-17
(SMA-4000-B)
SMA-4000-17
SMA-4000-18
SMA-4000-19, 20, 21, 22
2. INSULATIONS (S.F.) AND (S.E.) ARE OPERATED BY
STANDARD (S.F.)
3. EQUIPMENT (S.F.) SUPPLIED BY S.M.R.
4. INSULATION (S.F.) ARE INDICATED THROUGH (S.F.)
STANDARD (S.F.)
5. EQUIPMENT (S.F.) OF THE (S.F.) ARE ALL
CONNECTED TO THE (S.F.) STANDARD (S.F.) SHEET
STANDARD (S.F.) EQUIPMENT (S.F.) IS (S.F.)
AND IS (S.F.) WITH (S.F.) EQUIPMENT (S.F.)
6. OUTDOOR (S.F.) IS (S.F.) TO S.M.R.
7. DRAWING (S.F.) 7-10-1
8. ALL CONNECTIONS TO BE (S.F.) LEASE
RELAY (S.F.) OF A (S.F.) FOR
SAFETY WHEN PART OF THIS CIRCUIT IS
DISCONNECTED

CEE-TBB-94 sheet 2

[illegible]

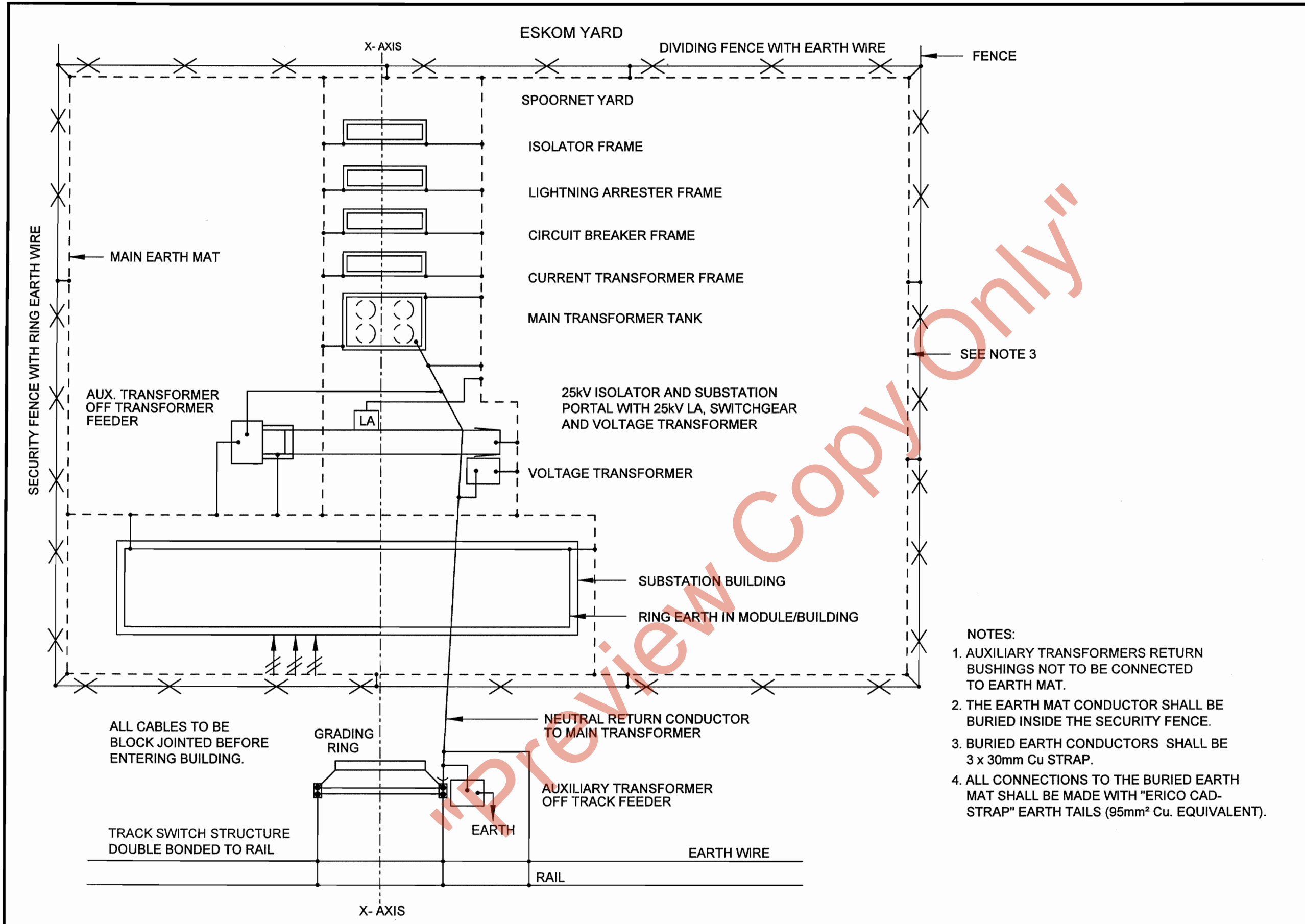
This document and the information contained herein is confidential. It shall not, without prior written notice of Siemens AG, be reproduced or otherwise made available to third parties. Siemens AG shall not accept any liability for errors or omissions. The text and any other information may change without notice. © 2007, all rights reserved. All trademarks are the property of their respective owners.



The drawings and the information contained herein are the property of Siemens AG. They are not to be used for any other purpose than the one for which they were prepared. The drawings are not to be used for any other purpose than the one for which they were prepared.

S.A.R. CONTRACT JCK 97 00 0		S.A.R. SILICON SUBSTATIONS		NO.
DATE	1997-01-01	DATE	1997-01-01	1
DESIGN	DESIGN	DESIGN	DESIGN	2
CONSTRUCTION	CONSTRUCTION	CONSTRUCTION	CONSTRUCTION	3
OPERATION	OPERATION	OPERATION	OPERATION	4
MAINTENANCE	MAINTENANCE	MAINTENANCE	MAINTENANCE	5
REPAIRS	REPAIRS	REPAIRS	REPAIRS	6
REPLACEMENT	REPLACEMENT	REPLACEMENT	REPLACEMENT	7
REVISIONS	REVISIONS	REVISIONS	REVISIONS	8
REVISIONS	REVISIONS	REVISIONS	REVISIONS	9
REVISIONS	REVISIONS	REVISIONS	REVISIONS	10
REVISIONS	REVISIONS	REVISIONS	REVISIONS	11
REVISIONS	REVISIONS	REVISIONS	REVISIONS	12
REVISIONS	REVISIONS	REVISIONS	REVISIONS	13
REVISIONS	REVISIONS	REVISIONS	REVISIONS	14
REVISIONS	REVISIONS	REVISIONS	REVISIONS	15
REVISIONS	REVISIONS	REVISIONS	REVISIONS	16
REVISIONS	REVISIONS	REVISIONS	REVISIONS	17
REVISIONS	REVISIONS	REVISIONS	REVISIONS	18
REVISIONS	REVISIONS	REVISIONS	REVISIONS	19
REVISIONS	REVISIONS	REVISIONS	REVISIONS	20
REVISIONS	REVISIONS	REVISIONS	REVISIONS	21
REVISIONS	REVISIONS	REVISIONS	REVISIONS	22
REVISIONS	REVISIONS	REVISIONS	REVISIONS	23
REVISIONS	REVISIONS	REVISIONS	REVISIONS	24

CEE-TBB-94 sheet 10

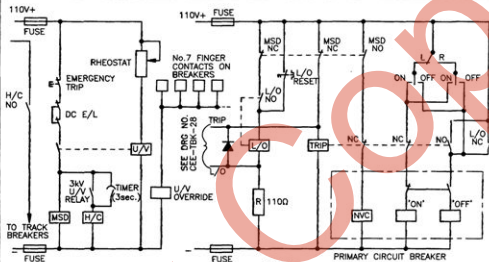


- NOTES:
- 1. AUXILIARY TRANSFORMERS RETURN BUSHINGS NOT TO BE CONNECTED TO EARTH MAT.
 - 2. THE EARTH MAT CONDUCTOR SHALL BE BURIED INSIDE THE SECURITY FENCE.
 - 3. BURIED EARTH CONDUCTORS SHALL BE 3 x 30mm Cu STRAP.
 - 4. ALL CONNECTIONS TO THE BURIED EARTH MAT SHALL BE MADE WITH "ERICO CAD-STRAP" EARTH TAILS (95mm² Cu. EQUIVALENT).

AMENDMENTS		
NO	NAME	DATE
2	A MACPHERSON	98-07-08
REDRAWN AND REVISED DO REF: T98/030		
3	LO BORCHARD	98-10-30
DRAWING REVISED DO REF: T98/054		
4	LO BORCHARD	2003-02-26
LIGHTNING ARRESTER BETWEEN TRANSFORMER AND EARTH MAT REMOVED. NOTES REVISED. ECP REF: 2003-031 DO REF: CDO/2392		
5	LO BORCHARD	2003-03-25
MOVED MAIN EARTH MAT TO INSIDE OF SECURITY FENCE. NOTE 2 REVISED. ECP REF: 2003-040 DO REF: CDO/2552		
6	<i>[Signature]</i>	2003-08-29
TWO LIGHTNING ARRESTERS REMOVED. EARTH STRAPS ADDED TO BOTH AUX. TRANSFORMERS AND VOLTAGE TRANSFORMER. ECP REF: 2003-067 DO REF: CDO/2914		
DIMENSIONS: mm SCALE: NTS		
		A3
DRAWING NO CEE- TBD - 8		
SHEET - OF -		

DO REF: T80/49	GEN TOL: LIN±	ANG±
DRN: B STEWART	CKD: H E MANTHE	DATE: 80-08-14
ENG: _____	R S MANN	for CHIEF ENG
CENTRAL DRAWING OFFICE		

EARTHING ARRANGEMENT: 25kV AC TRACTION SUBSTATION



AMENDMENTS		
NO	NAME	DATE

DO REF: T98/005	GEN TOL: LIN±	ANG±
DRN: M SITHOLE	CKD: JVT	DATE: 98-01-21
ENG: LO BORCHARD	LO BORCHARD	for CHIEF ENG

**CONTROL CIRCUIT DIAGRAM:
NO-VOLT COIL PROTECTION**

INFRASTRUCTURE
(ELECTRICAL)

SPOORNET

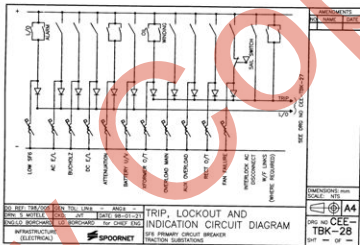
SF6 PRIMARY CIRCUIT BREAKER
TRACTION SUBSTATIONS

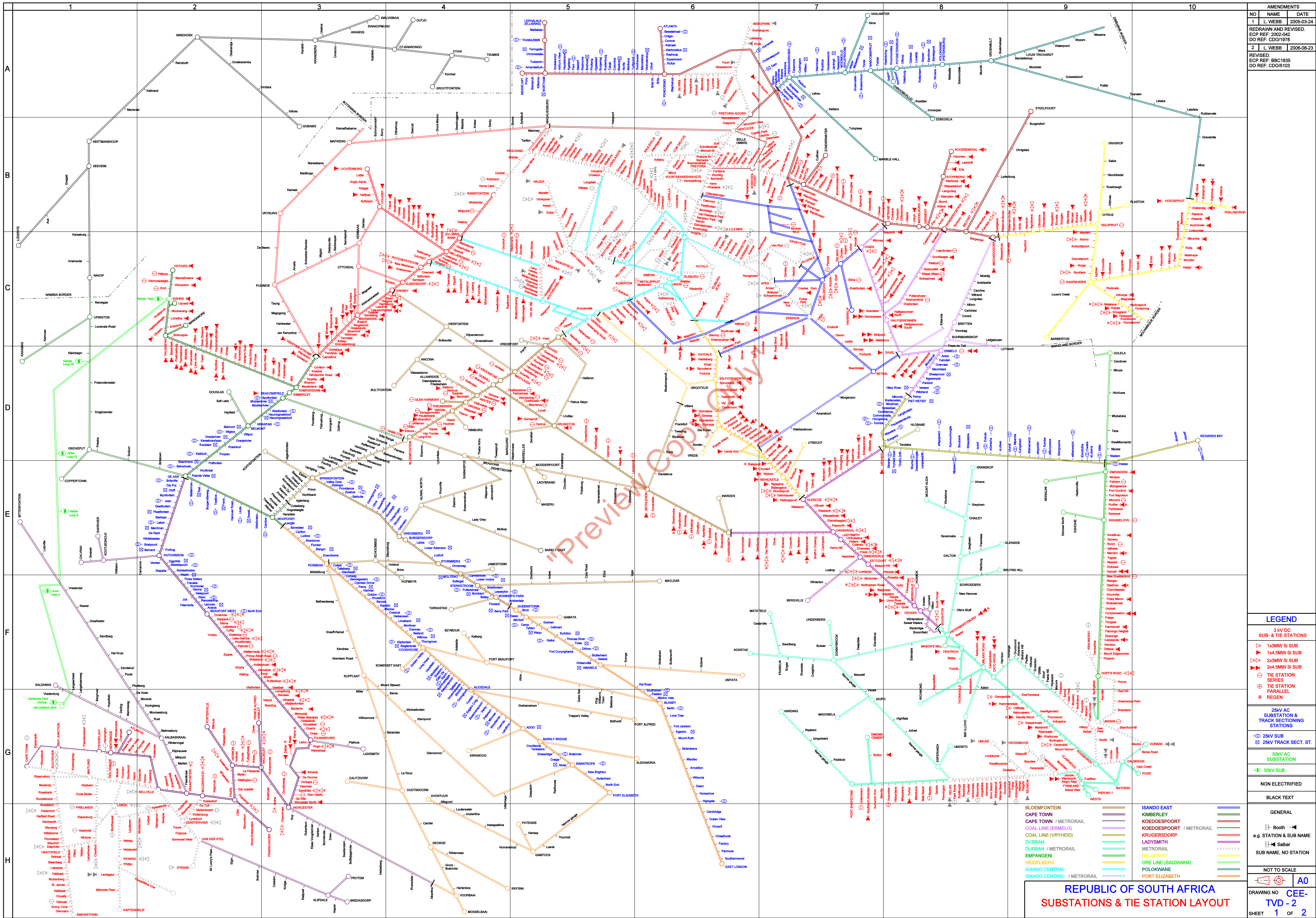
DIMENSIONS: mm
SCALE: NTS

A4

ORG NO **CEE-TBK-27**

SHT — OF —





AMENDMENTS		
NO	NAME	DATE
1	L. WEBB	2005-03-24
REDRAWN AND REVISED. ECP REF: 2002-042 DO REF: CDO/1978		
2	L. WEBB	2006-08-23
REVISED. ECP REF: 88C1836 DO REF: CDO/5103		

LEGEND

- 3 kV DC
SUB-STATION & TIE STATIONS
- 1x3MW SI SUB
 - 1x4.5MW SI SUB
 - 2x3MW SI SUB
 - 2x4.5MW SI SUB
 - TIE STATION
 - SERIES
 - STATION
 - PARALLEL
 - REGEN

- 25kV AC
SUBSTATION &
TRACK SECTIONING
STATIONS
- 25kV SUB
 - 25kV TRACK SECT. ST.
 - 50kV AC
SUBSTATION
 - 50kV SUB

NON ELECTRIFIED

BLACK TEXT

GENERAL

- Both
- e.g. STATION & SUB NAME
- Salbar
- SUB NAME, NO STATION

NOT TO SCALE

A0

DRAWING NO CEE-

TVD-2

SHEET 1 OF 2

TRANSNET

S417 (1988)

SPECIFICATION FOR VEGETATIVE EROSION CONTROL

CONTENTS

	<u>PAGE</u>
<u>PART A</u> : TOPSOILING AND HYDROSEEDING	2
<u>PART B</u> : SUPPLY, LAYING AND ESTABLISHMENT OF GRASS SODS	8
<u>PART C</u> : GRASS PLANTING	12

PART A - TOPSOILING AND HYDROSEEDING

A1. SCOPE

This part covers soil preparation, materials and techniques required for topsoiling, the application of seeds and achievement of acceptable grass cover by the hydroseeding process.

A2. DEFINITIONS

Acceptable Grass Cover means that treated areas shall display hydroseeded grasses not less than 100mm high, over 80% of the area. Bare or poorly established areas not larger than 5m² will be deemed to be acceptable, provided that the length of such areas as measured down a slope does not exceed the width as measured across the slope.

Hydroseeding means the process whereby seeds, fertiliser and mulching agents are combined in suspension in a water based slurry, which is then applied from a tank through a nozzle to the prepared soil surface.

A3. MATERIAL

A3.1 TOPSOIL

Topsoil shall be free of weeds, roots, stumps, excessive clay, stones larger than 75mm, litter and extraneous matter. Naturally occurring grasses shall be retained.

A3.2 FERTILIZER

A3.2.1 One or more of the following fertilizers will be used:

- Single superphosphate
- 2-3-2 (22%)
- Limestone ammonium nitrate (LAN) 28%
- Calcitic agricultural lime.
- Dolomitic agricultural lime.

A3.2.2 Fertilizers shall comply with the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) as amended.

A3.3 SEEDS

A3.3.1 Seed types and mixes shall be as specified by the Engineer and shall comply with the Plant Improvement Act (Act 53 of 1976) and the Plant Improvement Amendment Act (Act 10 of 1979) as amended.

A3.3.2 At least 30 days prior to the intended date of sowing, the Contractor shall provide the Engineer with samples of the required mass of each batch of each variety of seed for random germination and purity tests to be undertaken by the Department of Agricultural Economics and Marketing.

A3.3.3 Seeds shall be mixed on site under the supervision of the Engineer.

A4. PLANT

The seeding mixture consisting of seed, fertilizer and mulch shall be applied by a "hydroseeder" type distributor which shall incorporate a built-in agitator system, and be capable of even and regulated distribution at the rate of application specified in the Project Specification.

A5. CONSTRUCTION

A5.1 SOIL CONDITIONS

Soil surfaces will not necessarily be topsoiled, and may vary considerably in their organic content, growth supporting potential, and nutritional value. Growth establishment procedures shall take into account all classes of material encountered.

A5.2 TOPSOILING

A5.2.1 Soil Preparation Prior to Topsoiling

Batters to be topsoiled should be left sufficiently rough to ensure an adequate bond between the topsoil and the batter. Where this has not been achieved the Contractor shall prepare the slopes by forming horizontal ledges not less than 100mm wide and at centres of not more than 300m when measured down the slope.

A5.2.2 Selection, Loading, Hauling and Spreading of Topsoil

A5.2.2.1 Selection and stockpiling of topsoil, if required, shall be carried out as specified in the Project Specification

A5.2.2.2 Topsoil shall be loaded from designated stockpiles and hauled to the points of spreading.

A5.2.2.3 Topsoil shall be spread to an average thickness of 75mm, but shall nowhere be less than 50mm nor more than 100mm thick. Topsoil shall be worked with rakes or other suitable equipment to achieve a firm and regular surface.

A5.3 SOIL PREPARATION PRIOR TO HYDROSEEDING

A5.3.1 The Contractor shall prepare the surface of areas to be hydroseeded, whether topsoiled or not, so that eroded areas are filled and excessive quantities of stones removed from the surface.

A5.3.2 Prior to hydroseeding, excessive growth of any nature which may be detrimental to the growth and establishment of seeded grasses shall be removed at the direction of the Engineer.

A5.3.3 Where directed by the Engineer, the surface of specified slopes shall be scarified or formed into horizontal ledges not less than 100mm wide and at centres of not more than 300mm, when measured down the slope.

A5.4. APPLICATION OF FERTILIZERS

A5.4.1. Soil Analysis

The Contractor shall arrange for the chemical analysis of representative samples of soil types encountered on the site. Based on the results of the soil analysis the Engineer, in consultation with the Contractor, shall direct the use of one or more of the specified fertilizers, or as detailed in the Project Specification.

A5.4.2. Fertilizers shall be applied as follows :

- i) During the hydroseeding process at the time of seeding, where fertilizers form part of the seeding slurry.
- ii) A single maintenance application after germination.

- A5.4.3. Fertilizers shall be applied uniformly, irrespective of the method of application employed by the Contractor.

A5.5. HYDROSEEDING

- A5.5.1. The Contractor shall not proceed with any hydroseeding until the Engineer has approved the preparation of the area.

- A5.5.2. Paper or woodfibre pulp shall be added to the seeding slurry at a rate not less than 250kg per hectare.

- A5.5.3. Hydroseeding shall be such that all materials in the mix are evenly and effectively applied at the rate specified.

A5.6. ESTABLISHMENT OF GROWTH

The Contractor shall be solely responsible for any measures required to achieve acceptable grass cover as defined.

Growth establishment measures shall include remedial seeding of bare areas, repair of all erosion, removal of vegetation likely to suppress the growth of seeded grasses, and any other measures necessary to achieve acceptable grass cover as defined. No payment will be made for any material or work required for remedial work or maintenance in order to achieve acceptable grass cover.

A6. COMPLETION OF WORK

- A6.1. The Contractor shall complete all seeding or planting work as early as practicable within the contract period.

- A6.2. Contrary to the requirements of the E5 General Conditions of Contract, the maintenance period for vegetative erosion control works is the period required to achieve acceptable grass cover.

7. VOID

A8. MEASUREMENT AND PAYMENT

A8.1 BASIC PRINCIPLES

A8.1.1 Topsoiling

A8.1.1.1 Payment for forming of ledges as described in A5.2.1 will be made per m².

A8.1.1.2 Selection and stockpiling of topsoil will be measured as specified in the Project Specification.

A8.1.1.3 Loading from designated stockpiles, hauling and spreading of topsoil will be measured per m² of area topsoiled as specified.

A8.1.1.4 Designated stockpiles shall be inspected to determine the work required to comply with A3.1, since no separate payment will be made for this work.

A8.2 SCHEDULED ITEMS

A8.2.1 Preparation Prior to Topsoiling by Forming Ledges (m²)

A8.2.2 Topsoiling (m²)

The rate tendered shall allow for loading topsoil from designated stockpiles, hauling and spreading, including all the work required to attain compliance with specifications.

NOTE Payment will also be made under this item for topsoiling of areas which are to be planted with sods or grass roots.

A8.2.3 Provide and Apply Fertilizers (t)

The rate tendered shall allow for provision, transport, storage and application of fertilizers, and shall include all incidental costs including provision for refertilization required for growth establishment.

Separate payment will be made for the provision and application of each specific fertilizer.

A8.2.4 Provide and Apply Seeds (kg)

The rate tendered shall allow for provision, transport, storage and application of seeds as well as all incidental costs

A8.2.5 Soil Preparation Prior to Hydroseeding (m²)
The rate tendered shall allow for all labour and incidental costs required to prepare areas by forming ledges as specified.

A8.2.6 Hydroseeding (m²)

A8.2.6.1 The rate tendered shall allow for erosion repairs up to 300 mm deep, application of fertilizers and seeds, supply and application of pulp and materials not measured elsewhere, growth establishment as described and any incidental work required for the achievement of acceptable grass cover. The rate shall allow for all soil types encountered

A8.2.6.2 Payment for hydroseeding will be made as follows :

As a progress payment, 70% will be payable after acceptable completion of hydroseeding. The balance will be paid after achieving acceptable grass cover.

PART B : SUPPLY, LAYING AND ESTABLISHMENT OF GRASS SODS

B1. SCOPE

This part covers the provision, laying and establishment of grass sods required for landscaped areas, and for the erosion protection of slopes of cuttings and embankments.

B2. DEFINITIONS

Acceptable Grass Cover means that 90% of the area shall be established with living sods of the grass species specified, and that there shall be no bare patches with any dimensions larger than 150mm. Sodding shall display vigorous growth and shall achieve reasonable root penetration. The area shall be finished to the required contour and be free of weeds and erosion damage to the surface.

B3. MATERIALS

B3.1.1 PLANT MATERIAL

Nursery - grown sods shall be either *Pennisetum clandestinum* (kikuyu) or *Cynodon dactylon* (kweek), as specified or allowed by the Engineer.

The grass shall have been grown specifically for sod purposes, mowed regularly and maintained to provide an approved quality of uniformity, and sods shall be not less than 0,5m² in area.

B3.1.2 Grass sods shall be fresh and living and shall be harvested, delivered and planted within 36 hours unless otherwise authorised by the Engineer. Grass sods shall contain a minimum of 20mm of soil to ensure proper growth when planted, and shall be free of noxious weeds and diseases.

B3.1.3 Pasture or veld sods will only be accepted under exceptional circumstances, but will not be permitted for use in landscaped areas. The source and quality of pasture or veld sods shall be subject to the Engineer's approval.

B3.1.4 Sodds shall be such that they do not crumble, break or tear during handling or placing.

B3.2 FERTILIZER

The terms of A3.2 shall apply.

B4. PLANT

Grass sods shall be harvested by special machines manufactured for this purpose, so as to ensure a uniform thickness of sods.

B5. CONSTRUCTION

B5.1 PURPOSE OF GRASS SODDING

The establishment of sodding is required as an anti-erosion measure on slopes or in areas where immediate coverage is essential. The supply of sods and the procedures adopted for the laying and establishment thereof, shall be directed towards the rapid establishment of growth. The Contractor shall be liable for any remedial work made necessary by non-compliance with the abovementioned principles.

B5.2 SITE CONDITIONS AND ACCESS

In addition to landscaped areas, sodding may be required at bridge abutments, culverts, tunnel portals, adjacent to concrete lined drains and on the side slopes of earthworks. The Contractor shall therefore make due allowance for restricted access; and for work carried out on steep slopes and in small localised areas.

B5.3 SOIL CONDITIONS AND TOPSOIL

All conditions relevant to topsoil and the upper soil layers as described in A3.1, A5.1 and A5.2 shall be applicable to the establishment of sods, except that stones larger than 25mm and naturally occurring grasses shall be removed from the topsoil.

B5.4 SOIL PREPARATION PRIOR TO SODDING

B5.4.1 The terms of A5.3.1 and A5.3.2 shall apply mututis mutandis.

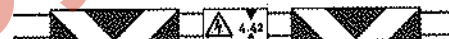
B5.4.2 The area to be sodded shall be contoured and trimmed to the required shape such that contact with the soil over the full area of the sod may be achieved.

B5.4.3 The area shall be ploughed or raked to achieve a loose surface. Ploughing of landscaped areas shall be done to a depth of not less than 100mm.

B5.4.4 Preparation of sloped earthworks shall include the repair of erosion and the work necessary for the forming of the desired surface shape in the case of vegetated downlets or sodded drains.

Name of Certificate Holder											
ID. Nr:											
have been inducted by											
Inductor Contact Nr:											
()						
Date of Induction:											
At											
Valid Until:											
Signed:						Signed:					
(Inductee)						(Inductor)					

- Heavy machinery and fast moving trains (be especially careful where there are multiple tracks)!
- High Voltage Areas
- Uneven walkways
- Unmanned Level Crossings
- Noise
- Dust
- Handling and transportation of Hazardous Substances



Hazards you would encounter on Transnet Freight Rail's Premises (Continued)

Contractors and visitors are expected to follow some simple rules to keep yourself and those around you safe:

- ❖ You may not be under the influence of alcohol or drugs – alcohol tests are mandatory for all contractors
- ❖ Do not talk on a cell phone – it will distract you
- ❖ Do not stand on the railhead – step over it
- ❖ Do not climb through or underneath stationery trains – rather walk around a train, approx. 2m clear!
- ❖ No objects to be placed on the tracks – you could jam the points and cause derailments!
- ❖ Always walk alongside the tracks (minimum of 2m from the edge of the track) and not between the tracks. You may get run over by passing trains
- ❖ Vehicles must be parked well clear of tracks or as per instruction by operator
- ❖ Obey all speed limits and adjust speed according to road conditions (service roads and yards)

- ❖ Take extra care when crossing at level crossings!
- ❖ When exposed to noisy machinery wear hearing protection
- ❖ Beware of danger of working in elevated positions – Fall Protection Plan is to be in place (where applicable)
- ❖ Only TFR approved PPE is allowed in close proximity to the track. The wearing of Red, Green or Yellow clothing is not permitted
- ❖ Employees are not allowed to sit or lie on ballast or track when taking a rest
- ❖ When working in the veld beware of Snakes, Ticks, Bee's, Scorpions and other hidden hazards etc!!



ADDENDUM NO. 1

TO THE

SECONDARY AND GENERAL SPECIFICATIONS

OF THE CONTRACT

- 1) Where ever the word "Spoornet" appears in these specifications, please replace it with "Transnet Freight Rail".
- 2) Wherever reference is made to the E5(M.W.)(1996), the E5(Nov.1996) or E160 General Conditions of Contract, please refer to the Conditions of Contract of the ECC3 Contract.
- 3) Where ever the words "Technical Officer" appear in these specifications, please replace with "Supervisor".



(REGISTRATION NO.1990/000900/06)

TRADING AS TRANSNET Freight Rail

MINIMUM COMMUNAL HEALTH REQUIREMENTS IN AREAS OUTSIDE THE JURISDICTION OF A LOCAL AUTHORITY: TEMPORARY FACILITIES FOR CONTRACTOR'S PERSONNEL

1. CAMPS

- 1.1 Prior to the erection of any camp, the Contractor shall submit to the Technical Officer, for his approval, details of his proposals as to the site, water supply, sanitation, and size and type of buildings. Where the site is on private land, the Contractor shall submit the written approval for the use of the site of the relevant statutory authority and of the owner and occupier of the land (as applicable).
- 1.2 Camps must not be erected on land infested with field rodents.
- 1.3 Adequate drainage shall be provided to carry off storm and waste water.
- 1.4 Buildings shall be built to a neat and orderly pattern.
- 1.5 All buildings shall have smooth, hard, impervious floors, graded to provide effective drainage and to permit washing.
- 1.6 Camps shall be maintained by the Contractor at his own expense in a clean and tidy condition. The Contractor shall take such steps as the Technical Officer and landowner/occupier may demand to prevent the creation of a nuisance.
- 1.7 When so instructed by the Technical Officer, the Contractor shall, at his own expense, erect suitable screens between the camp and any public road, thoroughfare or railway line.
- 1.8 After removal of a camp, the Contractor shall, at his own expense, restore the site to its original condition to the satisfaction of the Technical Officer and of the landowner and occupier where the site is on private land.

2. HOUSING

- 2.1 Every living room shall have cross ventilation, both constant and occasional. Where only one window is provided, it shall not be in the same wall as the door.

- 2.2 Dimensions of living rooms shall be sufficient to allow 3.5 square metres of floor area and 11 cubic metres of air space for each person over the age of 10 years. The floor area of any living room shall not be less than 7,8 square metres.
- 2.3 Flat-roofed quarters shall have a minimum roof height of 3 metres above floor level. For quarters with pitched roofs, the wall height shall be not less than 2,6 metres above the floor with a minimum height above floor of 3 metres at the top of the pitch.
- 2.4 Doors shall not be less than 2m x 0,75m and must be halved.
- 2.5 Windows of each living room shall have an area not less than one twelfth of the floor area and shall be capable of opening to at least half their full area.
- 2.6 In areas where malaria is prevalent, doors and windows must be fitted with gauze screens.
- 2.7 Cooking shelters shall comprise roofed structures, three sides of which shall be enclosed by a weatherproof material, approved by the Technical Officer to a height of at least 1m above ground level.
 - 2.7.1 Sleeping quarters shall not accommodate more than 8 persons per room.
 - 2.7.2 Pegboards shall be carried on metal or concrete supports and shall be separated by partitions not less than 0,4 metres high extending to within 150mm of the end of the bunk. Pegboards shall be removable for cleaning.

3. **WATER SUPPLY AND ABLUTION FACILITIES**

- 3.1 The Contractor shall ensure that an adequate and conveniently situated supply of potable water is provided.
- 3.2 Separate buildings for ablution facilities shall be provided. Where approval has been obtained for the housing of both males and females, separate facilities for each sex shall be provided. The proportion shall be 1 cubicle for 20 persons.
- 3.3 Waste water shall be hygienically disposed of.

4. **SANITATION**

- 4.1 Separate buildings for latrine facilities shall be provided. Where housing are provided for both males and females, separate facilities for each sex shall be provided. The proportions shall be at least one squatting seat for every 15 persons or less in the case of pit latrines, or one for every 10 persons or less in case of pail latrines.

Latrines shall be fly proof and sited at least 10 metres from any other building, and shall not face on any public road, thoroughfare, railway line or residential property. Pits shall not be less than 2,5 metres deep and sited not less than 120 metres from nearest underground water source.

- 4.2 Latrines shall be so constructed, situated and maintained, and night soil so disposed of as to prevent access by animals, breeding of flies, pollution of streams and domestic water supplies, and other nuisances. Where a night soil removal service is operated by a competent authority, use of such service shall be obligatory, and the use of pit latrines and atria pits will not be permitted.
- 4.3 At least one refuse bin of adequate size with close fitting lid shall be provided for each building. Refuse bins shall be emptied and cleaned out daily.
- 4.4 Labour shall be employed on camp sanitation duties on the following basis:-
- 4.4.1 Where the number of persons living at the camp is 20 or less - one unit.
- 4.4.2 For additional numbers over 20 living at the camp - one unit per 100 or part thereof.
- 4.5 Unless refuse is removed by a competent authority, it shall be disposed of in pits and covered over daily with a layer of earth or ash of sufficient thickness to prevent depredations by rodents and the breeding of flies.
- 4.6 Adequate measures shall be taken against all vermin and insects responsible for the spread of disease. Any instructions of a competent health authority shall be carried out promptly and implicitly.
- 4.7 Buildings and bedboards shall be treated whenever necessary with an approved insecticide.
- 4.8 The Contractor shall permit and facilitate inspection of the camp and structures on the site by the staff of Transnet or any other competent authority, and shall comply with any reasonable request by such staff or any other competent authority to eliminate any unsanitary condition.
- 4.9 Any outbreak of infectious disease shall immediately be reported telephonically and confirmed in writing to the Technical Officer.
- 4.10 The keeping of animals of any sort is not permitted.
- 4.11 The Contractor shall have on hand at the camp the necessary tools, disinfectants and cleaning materials to maintain and clean the sanitary facilities.

5. **RATIONS**

Rations, where supplied by the Contractor, shall be stored in a suitable and rodent proof building with sufficient shelving.

P02b-06 (JLH)



TRANSNET LIMITED
(Registration no. 1990/000900//06)

**SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE
WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT
(ACT 85 OF 1993) AND APPLICABLE REGULATIONS**

1. General

- 1.1 The Contractor and Transnet Limited (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.
- 1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.
- 1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.
- 1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Project Manager or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.
- 1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

2. Definitions

- 2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -

- 2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "**Construction Work**", which, in terms of the Construction Regulations, 2003 means any work in connection with: -
- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
 - (b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;
 - (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
 - (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;
- 2.3 "**competent person**" in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;
- 2.4 "**contractor**" means principal contractor and "subcontractor" means contractor as defined by the Construction Regulations, 2003.
- 2.5 "**fall protection plan**" means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;
- 2.6 "**health and safety file**" means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;
- 2.7 "**Health and Safety Plan**" means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;
- 2.8 "**Risk Assessment**" means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;
- 2.9 "**the Act**" means the Occupational Health and Safety Act No. 85 of 1993.

3. Procedural Compliance

- 3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-
- (a) includes the demolition of a structure exceeding a height of 3 metres; or

- (b) includes the use of explosives to perform construction work; or
- (c) includes the dismantling of fixed plant at a height greater than 3m,

and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-

- (a) includes excavation work deeper than 1m; or
- (b) includes working at a height greater than 3 metres above ground or a landing.

- 3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Project Manager or employee.
- 3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Project Manager. Copies should also be retained on the health and safety file.
- 3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Project Manager.
- 3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.
- 3.6 The Contractor shall, before commencing any work, obtain from the Project Manager an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Project Manager with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Transnet's safety requirements and procedures.

4. Special Permits

Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Project Manager or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.

5. Health and Safety Programme

- 5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -
- (i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;
 - (ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;
 - (iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.
- 5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.
- 5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:
- (a) The identification of the risks and hazards that persons may be exposed to;
 - (b) the analysis and evaluation of the hazards identified;
 - (c) a documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;
 - (d) a monitoring and review plan.
- 5.4 The Health and Safety Plan shall include full particulars in respect of: -
- (a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;
 - (b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;
 - (c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;

- (d) the site access control measures pertaining to health and safety to be implemented;
 - (e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Project Manager with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and
 - (f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.
- 5.4 The Health and Safety programme shall be subject to the Project Manager's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Project Manager's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Project Manager or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.
- 5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between the them, but at least once every month.
- 5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.
- 5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Project Manager, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.
- 5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.
- 5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.

- 5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.

6. Fall Protection Plan

- 6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;
- 6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 6.3 The fall protection plan shall include:-
- (a) A Risk Assessment of all work carried out from an elevated position;
 - (b) the procedures and methods to address all the identified risks per location;
 - (c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;
 - (d) the training of employees working from elevated positions; and
 - (e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

7. Hazards and Potential Hazardous Situations

The Contractor and the Project Manager shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

8. Health and Safety File

- 8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Project Manager, or subcontractor upon request.
- 8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Project Manager.
- 8.3 The Contractor shall hand over a consolidated health and safety file to the Project Manager upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

ANNEXURE 1

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

Regulation 3(1) of the Construction Regulations

NOTIFICATION OF CONSTRUCTION WORK

-
-
- 1(a) Name and postal address of principal contractor:

- (b) Name and tel. no of principal contractor's contact person:

2. Principal contractor's compensation registration number: _____
- 3.(a) Name and postal address of client:

- (b) Name and tel no of client's contact person or agent:

- 4.(a) Name and postal address of designer(s) for the project:

- (b) Name and tel. no of designer(s) contact person:

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1).

6. Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).

7. Exact physical address of the construction site or site office:

8. Nature of the construction work:

9. Expected commencement date: _____
10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site: _____

12. Planned number of contractors on the construction site accountable to the principle contractor:

13. Name(s) of contractors already chosen.

Principal Contractor

Date

Client

Date

* THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.

* **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

ANNEXURE 2

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

SECTION/REGULATION: _____

REQUIRED COMPETENCY: _____

In terms of _____ I, _____
representing the Employer) do hereby appoint _____

As the Competent Person on the premises at _____
(physical address) to assist in compliance with the Act and the applicable Regulations.

Your designated area/s is/are as follows :-

Date : _____

Signature :- _____

Designation :- _____

ACCEPTANCE OF DESIGNATION

I, _____ do hereby accept this Designation and acknowledge that I
understand the requirements of this appointment.

Date : _____

Signature :- _____

Designation :- _____

ANNEXURE 3

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

DECLARATION

In terms of the above Act I, _____ am personally assuming the duties and obligations as Chief Executive Officer, defined in Section 1 of the Act and in terms of Section 16(1), I will, as far as is reasonably practicable, ensure that the duties and obligations of the Employer as contemplated in the above Act are properly discharged.

Signature :- _____

Date : _____

ANNEXURE 4

(LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET LIMITED)

SITE ACCESS CERTIFICATE

Access to : _____ (Area)
Name of Contractor/Builder :- _____
Contract/Order No.: _____

The contract works site/area described above are made available to you for the carrying out of associated works

In terms of your contract/order with
(company) _____

Kindly note that you are at all times responsible for the control and safety of the Works Site, and for persons under your control having access to the site.

As from the date hereof you will be responsible for compliance with the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended, and all conditions of the Contract pertaining to the site of the works as defined and demarcated in the contract documents including the plans of the site or work areas forming part thereof.

Signed : _____ **Date :** _____
PROJECT MANAGER

ACKNOWLEDGEMENT OF RECEIPT

Name of Contractor/Builder :- _____ **I,**
_____ **do hereby acknowledge and accept the duties**
and obligations in respect of the Safety of the site/area of Work in terms of the Occupational Health and
Safety Act; Act 85 of 1993.

Name : _____ **Designation :** _____

Signature : _____ **Date :** _____



TRANSNET SOC LTD
(Registration no. 1990/000900//06)

**SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE
WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT
(ACT 85 OF 1993) AND APPLICABLE REGULATIONS**

1. General

- 1.1 The Contractor and Transnet SOC Ltd (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.
- 1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.
- 1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.
- 1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Project Manager or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.
- 1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

2. Definitions

- 2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -

2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "**Construction Work**", which, in terms of the Construction Regulations, 2003 means any work in connection with: -

- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
- (b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;
- (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
- (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;

2.3 "**competent person**" in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;

2.4 "**contractor**" means principal contractor and "subcontractor" means contractor as defined by the Construction Regulations, 2003.

2.5 "**fall protection plan**" means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;

2.6 "**health and safety file**" means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;

2.7 "**Health and Safety Plan**" means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;

2.8 "**Risk Assessment**" means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;

2.9 "**the Act**" means the Occupational Health and Safety Act No. 85 of 1993.

3. Procedural Compliance

3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-

- (a) includes the demolition of a structure exceeding a height of 3 metres; or

- (b) includes the use of explosives to perform construction work; or
- (c) includes the dismantling of fixed plant at a height greater than 3m,

and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-

- (a) includes excavation work deeper than 1m; or
- (b) includes working at a height greater than 3 metres above ground or a landing.

- 3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Project Manager or employee.
- 3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Project Manager. Copies should also be retained on the health and safety file.
- 3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Project Manager.
- 3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.
- 3.6 The Contractor shall, before commencing any work, obtain from the Project Manager an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Project Manager with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Transnet's safety requirements and procedures.

4. Special Permits

Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Project Manager or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.

5. Health and Safety Programme

- 5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -
- (i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;
 - (ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;
 - (iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.
- 5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.
- 5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:
- (a) The identification of the risks and hazards that persons may be exposed to;
 - (b) the analysis and evaluation of the hazards identified;
 - (c) a documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;
 - (d) a monitoring and review plan.
- 5.4 The Health and Safety Plan shall include full particulars in respect of: -
- (a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;
 - (b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;
 - (c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;

- (d) the site access control measures pertaining to health and safety to be implemented;
 - (e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Project Manager with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and
 - (f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.
- 5.4 The Health and Safety programme shall be subject to the Project Manager's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Project Manager's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Project Manager or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.
- 5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between the them, but at least once every month.
- 5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.
- 5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Project Manager, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.
- 5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.
- 5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.

- 5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.

6. Fall Protection Plan

- 6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;
- 6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 6.3 The fall protection plan shall include:-
- (a) A Risk Assessment of all work carried out from an elevated position;
 - (b) the procedures and methods to address all the identified risks per location;
 - (c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;
 - (d) the training of employees working from elevated positions; and
 - (e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

7. Hazards and Potential Hazardous Situations

The Contractor and the Project Manager shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

8. Health and Safety File

- 8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Project Manager, or subcontractor upon request.
- 8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Project Manager.
- 8.3 The Contractor shall hand over a consolidated health and safety file to the Project Manager upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

ANNEXURE 1

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

Regulation 3(1) of the Construction Regulations

NOTIFICATION OF CONSTRUCTION WORK

-
-
- 1(a) Name and postal address of principal contractor:

- (b) Name and tel. no of principal contractor's contact person:

2. Principal contractor's compensation registration number: _____
- 3.(a) Name and postal address of client:

- (b) Name and tel no of client's contact person or agent:

- 4.(a) Name and postal address of designer(s) for the project:

- (b) Name and tel. no of designer(s) contact person:

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1).

6. Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).

7. Exact physical address of the construction site or site office:

8. Nature of the construction work:

9. Expected commencement date: _____
10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site: _____

12. Planned number of contractors on the construction site accountable to the principle contractor:

13. Name(s) of contractors already chosen.

Principal Contractor

Date

Client

Date

* THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.

* **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

ANNEXURE 2

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

SECTION/REGULATION: _____

REQUIRED COMPETENCY: _____

In terms of _____ I, _____
representing the Employer) do hereby appoint _____

As the Competent Person on the premises at _____
(physical address) to assist in compliance with the Act and the applicable Regulations.

Your designated area/s is/are as follows :-

Date : _____

Signature :- _____

Designation :- _____

ACCEPTANCE OF DESIGNATION

I, _____ do hereby accept this Designation and acknowledge that I
understand the requirements of this appointment.

Date : _____

Signature :- _____

Designation :- _____

ANNEXURE 3

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

DECLARATION

In terms of the above Act I, _____ am personally assuming the duties and obligations as Chief Executive Officer, defined in Section 1 of the Act and in terms of Section 16(1), I will, as far as is reasonably practicable, ensure that the duties and obligations of the Employer as contemplated in the above Act are properly discharged.

Signature :- _____

Date : _____

ANNEXURE 4

(LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET SOC LTD)

SITE ACCESS CERTIFICATE

Access to : _____ (Area)
Name of Contractor/Builder :- _____
Contract/Order No.: _____

The contract works site/area described above are made available to you for the carrying out of associated works

In terms of your contract/order with
(company) _____

Kindly note that you are at all times responsible for the control and safety of the Works Site, and for persons under your control having access to the site.

As from the date hereof you will be responsible for compliance with the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended, and all conditions of the Contract pertaining to the site of the works as defined and demarcated in the contract documents including the plans of the site or work areas forming part thereof.

Signed : _____ Date : _____
PROJECT MANAGER

ACKNOWLEDGEMENT OF RECEIPT

Name of Contractor/Builder :- _____ I,
_____ do hereby acknowledge and accept the duties
and obligations in respect of the Safety of the site/area of Work in terms of the Occupational Health and
Safety Act; Act 85 of 1993.

Name : _____ Designation : _____

Signature : _____ Date : _____

Occupational Health and Safety Plan

Company name: _____

Project name: _____

Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details
2. Policy Statement
3. Objectives
4. Common Vocabulary
5. Legislation
6. Statutory Obligations
7. Project Management
8. Incident Management
9. Logbooks and Registers
10. Risk Management
11. Education and Training
12. Emergency Planning – Evacuation plan
13. Environment
14. Ergonomics
15. Health and Safety Communications
16. Safe working procedures
17. Personal Protective Equipment and Clothing
18. Project security
19. Implementation Costs

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1. PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

P O Box

Contact person - Name:

Contact No:

Telephone –

Cellular No:

Facsimile –

Email

1.2. Agent:

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Cellular No:

Facsimile –

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Cellular:

Facsimile –

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Contact No:

Telephone –

Cellular:

Assignee Sect 16(2)

Facsimile

Email

1.4.2. Construction Work Supervisor:

Name:

Contact No:

Telephone

Cellular telephone No:

Construction Regulation 6. (1)

Facsimile

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle Contractor and the other Contractors.

1.6. Duration of contract: Start – Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			
Project Manager:			
Safety Advisors:			
Telephone			
Facsimile			
Email			

DEPARTMENT OF LABOUR

Provincial Office
Department of Labour:
Contact No:

OCCUPATIONAL HEALTH AND SAFETY

2. Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle Contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3. Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all Contractors and their employees working on this project.

4. Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

- BCEA
COIDA
DoL
DoL (IES)
FEMA
NBR&S
OH&SA
CR
PD

5. Legislation

Definitions:

“client” the person for whom any construction work is performed,

Legislation

CR 4. (1)

“agent” means any person, appointed in writing to represents the Client,

CR 4 (5)

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

CR

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

CR

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,	CR
“Contractor” an employer who performs construction work,	CR
“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle Contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR

“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993), CR

“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work, CR

“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping, CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(a) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(b) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6. Statutory Obligations

Description

Legislation

6.1. Basic Conditions of Employment Act BCE

The relevant sections are to be complied with special attention to at least the following –
Working hours,
Conditions of employment and Remuneration,
Termination of employment,
Employment of child labour prohibited.

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993) COIDA

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee’s duties. All employers-Principle Contractor and Contractors must register with a compensation insurer – either COIDA or FEMA. They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insured prior to commencing work on the project with a copy on Site.

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993) OH&SA

The OH&SA is the primary law regulating occupational health and safety matters. The Act is a framework Act that provides for the development of detailed rules and standards through regulation. As a framework, the Act prescribes that -

- (a) the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,
- (b) the duties of employers to their employees, employees to their employer and suppliers to the employer and
- (c) the “reasonable man” approach by the employer in decisions concerning occupational health and safety,

- (d) the management, application and enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle Contractor and Contractor.
- (e) each principle Contractor and Contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from Contractor to Principle Contractor to the client. Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description

By whom

Legislation

7.1. Notification of Construction Work.

Principle Contractor

CR 3.1

7.2. Health and Safety Specification

Client to provide.

CR 4. (1)(a)

The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.

7.3. Health and Safety Plan

Contractor

CR 5. (1)

This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.

7.4. Health and Safety File

Contractor

CR 5. (7)

All documentation – minutes of health and safety committee meetings, risk identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.

7.5. Agreement with Mandatory

Client / Agent / Principle and Contractor

Act Sec 37(2)

A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.

7.6. Appointment of each Contractor by the Agent.

C R 5 (3) (b)

7.7. Organisation chart

7.7.1. Assignment of Duties

Contracts Manager

Act Sec 16(2)

Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.

7.7.2. Construction Supervisor

Site Agent

CR 6. (1)

Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.

7.7.3. Sub-ordinate Construction Supervisor.

CR 6. (2)

Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1.

NB Under no circumstances may a Contractor leave employees on the site unless there is a competent construction work supervisor present.

7.7.4. Construction Safety Officer

Part-time/Full-time

CR 6. (6)

Mr _____ has been appointed a part – time construction safety officer for the duration of the project.

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers:

Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address:

P O Box

Contact person:

Contact numbers:

Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address:

P O Box 1254 –

Contact person:

Contact numbers:

Telephone –
Cellular –

Facsimile
Email:

Every Contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB: A section 37(2) Agreement with Mandatory must be entered into between the Contractors and the principle Contractor.

NB Contractor who contracts out construction work. Where a Contractor contracts construction work out to another Contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s Act sect 18

Mr _____ is a designated health and safety representative.

He will perform his prescribed duties in his area of responsibility. Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator. C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector:

C R 14(2)

Mr _____ is appointed for this project.

Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8. Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project. Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury. Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented. The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES
Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

COID Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4 Investigation.

Sect 31 The

severity of the injury will dictate whom and when the investigation must be conducted. Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence. A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a Contractor is injured the Contractor and the health and safety representative for the area in which it occurred will be part of the team. The client or his agent may if they wish form part of the team. A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted. The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle Contractor and Contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle Contractor's and all Contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle Contractor and every Contractor. The following information must be recorded and kept on the health and safety file of the principle Contractor / s and the Contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted. Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

i) *working in an elevated position,*

R

8. (2)(b)

i. *suspended platform,*

ii. *Cranes – mobile - tower*

iii. *Construction vehicles.*

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary. The prescribed conditions will apply as though it was legislated.

CR 15(12) (a)

CR 20(g)

CR21 (1) (d)(ii)

CR 7. (1)

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. *Composition.*

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee. The Health and safety representatives will be required to attend the health and safety committee meetings. The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle Contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes. The Client, Principle Agent must receive a copy of the minutes. The audit of the Contractors must be consolidated, analysed and submitted to the principle Contractor and the client. The findings will be documented, analyses and recommendations made. Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required. The action agreed on i.e. the responsible man test - and the time scheduling must be implemented. As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. *First aid Equipment*

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project. The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his CR 27 (g) findings in the appropriate register.

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible. As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained. Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent. Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified. Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working.

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____ **3 Short sharp blasts**

Serious Incident : _____ **Long – short – long blasts**

All clear : _____ **5 seconds**

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based. The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is "the study of work". Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together. Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

15 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board. Where appropriate Newspaper clipping may be used during "tool box" talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

16. Safe work procedures.

A programme of safe work procedures is to be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed. The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.
All procedures need to be documented.

17. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee. The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle Contractor and Contractor must take all reasonable steps to ensure that PPE GSR 2(6) issued is used, worn and maintained as described.

18. Project / Site Security.

18.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site. Suitable information signs must be strategically positioned. They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

18.2. Access control

The Client is responsible for the access to and egress from the construction area.

19. Implementation costs.

The cost of implementation should include but are not limited to the following-

19.1. Administration

Project registration,
Occupational health and safety plan and file,
All assignments, appointments and designation,
Risk identifications and assessments and Logbooks and registers,
Health and safety committee meetings and minutes.

19.2. Training and Education

Induction training and badges,
First aid,
Health and safety representatives
Others - specify,

- 19.3. Legal compliance audits and reports.
Monthly or as required by the client.
- 19.4. Personal Protective Equipment and Clothing.
- 19.5. Other.
Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted. This approved plan will be made available to each Contractor prior to their commencing construction work on the project. We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

Name Signature Designation Date

Principle Contractor

Name Signature Designation Date

Principle Contractor

Name Signature Designation Date

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT





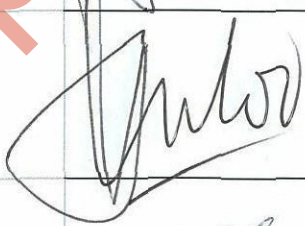

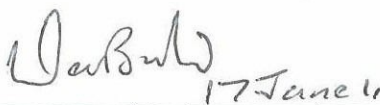

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

(This page not to be issued with contract)

SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

Author:	Project Manager Capital Program (Electrical)	G. Maposa	
Approved:	Senior Engineer Infra Engineering (Train Authorisation Systems)	J. van den Berg	
"	Principal Engineer Infra Engineering (Track)	M. Marutla	
"	Principal Engineer Infra Engineering (Structures)	J. Homan	
"	Principal Engineer Infra Engineering (Electrical)	J. Vosloo	
"	Principal Engineer Technology Management (Electrical)	W. Coetzee	
"	Chief Engineer Transport Telecoms	D. Botha	 17 June 11
Authorised:	Chief Engineer Infrastructure Engineering	J. van Aardt	 2011/06/30

Date:

May 2011

(This page not to be issued with contract)

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

CONTENTS

<u>CLAUSE</u>	<u>HEADING</u>	<u>PAGE</u>
1.0	SCOPE	3
2.0	DEFINITIONS	3
PART A - GENERAL SPECIFICATION		
3.0	AUTHORITY OF OFFICERS OF TRANSNET	4
4.0	CONTRACTOR'S REPRESENTATIVES AND STAFF	4
5.0	OCCUPATIONS AND WORK PERMITS	4
6.0	SPEED RESTRICTIONS AND PROTECTION	5
7.0	ROADS ON THE NETWORK OPERATOR'S PROPERTY	5
8.0	CLEARANCES	5
9.0	STACKING OF MATERIAL	5
10.0	EXCAVATION, SHORING, DEWATERING AND DRAINAGE	5
11.0	FALSEWORK FOR STRUCTURES	6
12.0	PILING	6
13.0	UNDERGROUND SERVICES	6
14.0	BLASTING AND USE OF EXPLOSIVES	6
15.0	RAIL TROLLEYS	7
16.0	SIGNAL TRACK CIRCUITS	7
17.0	PENALTY FOR DELAYS TO TRAINS	7
18.0	SURVEY BEACONS AND PEGS	7
19.0	TEMPORARY LEVEL CROSSINGS	8
20.0	COMPLETION OF THE WORKS	8
21.0	PROTECTION OF PERSONS AND PROPERTY	9
22.0	INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES	10
23.0	ACCESS, RIGHTS-OF-WAY AND CAMPSITES	10
24.0	SUPERVISION	10
25.0	HOUSING OF EMPLOYEES	10
26.0	OPTICAL FIBRE CABLE ROUTES	10
PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT		
27.0	GENERAL	11
28.0	WORK ON BUILDINGS OR FIXED STRUCTURES	11
29.0	WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING AND UNLOADING	11
30.0	USE OF EQUIPMENT	12
31.0	CARRYING AND HANDLING MATERIAL AND EQUIPMENT	12
32.0	PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE AND TREES ETC.	12
33.0	USE OF WATER	13
34.0	USE OF CONSTRUCTION PLANT	13
35.0	WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT	13
36.0	TRACTION RETURN CIRCUITS IN RAILS	13
37.0	HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR	14

1.0 SCOPE

- 1.1 This specification covers the network operator's requirements for general work and works on, over, under or adjacent to railway lines and near high voltage equipment.

2.0 DEFINITIONS

The following definitions shall apply:

"Authorised Person" - A person whether an employee of the network operator or not, who has been specially authorised to undertake specific duties in terms of Transnet' publication Electrical Safety Instructions, and who holds a certificate or letter of authority to that effect.

"Barrier" Any device designed to restrict access to "live" high-voltage electrical equipment.

"Bond" - A short conductor installed to provide electrical continuity.

"Contractor" - Any person or organisation appointed by the network operator to carry out work on its behalf.

"Contract Supervisor" - The person or juristic person appointed by the network operator from time to time as the Contract Supervisor, to administer the Contractor's performance and execution of the Works according to the powers and rights held by and obligations placed upon the Contract Supervisor in terms of the Contract.

"Dead" - Isolated and earthed.

"Electrical Officer (Contracts)" - The person appointed in writing by the Project Manager in terms of this specification as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

"Executive Officer" - The person appointed by the network operator from time to time as the Executive Officer to act according to the rights and powers held by and obligations placed upon him in terms of the Contract.

"High-Voltage" - A voltage normally exceeding 1000 volts.

"Live" - A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

"Near" - To be in such a position that a person's body or the tools he is using or any equipment he is handling may come within 3 metres of "live" exposed high-voltage electrical equipment.

"Occupation" - An authorisation granted by the network operator for work to be carried out under specified conditions on, over, under or adjacent to railway lines.

"Occupation Between Trains" - An occupation during an interval between successive trains.

"Optical Fibre Cable" - Buried or suspended composite cable containing optical fibres used in:

- telecommunication networks for transmission of digital information and
- safety sensitive train operations systems.

"Project Manager" - As defined in the special conditions of the contract. The person or juristic person appointed by the network operator from time to time as the Project Manager, to administer the Contract according to the powers and rights held by and obligations placed upon him in terms of the Contract.

"Responsible Representative" - The responsible person in charge, appointed by a contractor, who has undergone specific training (and holds a certificate) to supervise (general or direct) staff under his control who perform general work or to work on, over, under or adjacent to railway lines and in the vicinity of high-voltage electrical equipment.

"Total Occupation" - An occupation for a period when trains are not to traverse the section of line covered by the occupation.

"Work on" - Work undertaken on or so close to the equipment that the specified working clearances to the "live" equipment cannot be maintained.

"Work Permit" - A combined written application and authority to proceed with work on or near dead electrical equipment.

"Works" - The contractual intent for the work to be done as defined in the contract at a defined work site.

PART A - GENERAL SPECIFICATION

3.0 AUTHORITY OF OFFICERS OF TRANSNET

- 3.1 The Contractor shall co-operate with the officers of the network operator and shall comply with all instructions issued and restrictions imposed with respect to the Works which bear on the existence and operation of the network operator's railway lines and high-voltage equipment.
- 3.2 Without limiting the generality of the provisions of clause 3.1, any duly authorised representative of the network operator, having identified himself, may stop the work if, in his opinion, the safe passage of trains or the safety of the network operator's assets or any person is affected. **CONSIDERATIONS OF SAFETY SHALL TAKE PRECEDENCE OVER ALL OTHER CONSIDERATIONS.**

4.0 CONTRACTOR'S REPRESENTATIVES AND STAFF

- 4.1 The Contractor shall nominate Responsible Representatives of whom at least one shall be available at any hour for call-out in cases of emergency. The Contractor shall provide the Contract Supervisor with the names, addresses and telephone numbers of the representatives.
- 4.2 The Contractor guarantees that he has satisfied himself that the Responsible Representative is fully conversant with this specification and that he shall comply with all his obligations in respect thereof.
- 4.3 The Contractor shall ensure that all contractor staff receives relevant awareness, educational and competence training regarding safety as prescribed.

5.0 OCCUPATIONS AND WORK PERMITS

- 5.1 Work to be done during total occupation or during an occupation between trains or under a work permit shall be done in a manner decided by the Contract Supervisor and at times to suit the network operator requirements.
- 5.2 The Contractor shall organise the Works in a manner which will minimise the number and duration of occupations and work permits required.
- 5.3 The network operator will not be liable for any financial or other loss suffered by the Contractor arising from his failure to complete any work scheduled during the period of an occupation or work permit.
- 5.4 The Contractor shall submit to the Contract Supervisor, in writing, requests for occupations or work permits together with details of the work to be undertaken, at least 21 days before they are required. The network operator does not undertake to grant an occupation or work permit for any particular date, time or duration.
- 5.5 The network operator reserves the right to cancel any occupation or work permit at any time before or during the period of occupation or work permit. If, due to cancellation or change in date or time, the Contractor is not permitted to start work under conditions of total occupation or work permit at the time arranged, all costs caused by the cancellation shall be born by the Contractor except as provided for in clauses 5.6 to 5.8.
- 5.6 When the Contractor is notified less than 2 hours before the scheduled starting time that the occupation or work permit is cancelled, he may claim reimbursement of his direct financial losses caused by the loss of working time up to the time his labour and plant are employed on other work, but not exceeding the period of the cancelled occupation or work permit.
- 5.7 When the Contractor is notified less than 2 hours before the scheduled starting time, or during an occupation or work permit, that the duration of the occupation or work permit is reduced, he may claim reimbursement of his direct financial losses caused by the loss of working time due to the reduced duration of the occupation or work permit.
- 5.8 Reimbursement of the Contractor for any loss of working time in terms of clause 5.6 and 5.7, shall be subject to his claims being submitted within 14 days of the event with full details of labour and plant involved, and provided that the Contract Supervisor certifies that no other work on which the labour and plant could be employed was immediately available.
- 5.9 Before starting any work for which an occupation has been arranged, the Contractor shall obtain from the Contract Supervisor written confirmation of the date, time and duration of the occupation.
- 5.10 Before starting any work for which a work permit has been arranged, the Responsible Representative shall read and sign portion C of the Work Permit, signifying that he is aware of the work boundaries within which work may be undertaken. After the work for which the permit was granted has been completed, or when the

work permit is due to be terminated, or if the permit is cancelled after the start, the same person who signed portion C shall sign portion D of the Work Permit, thereby acknowledging that he is aware that the electrical equipment is to be made "live". The Contractor shall advise all his workmen accordingly.

6.0 SPEED RESTRICTIONS AND PROTECTION

- 6.1 When speed restrictions are imposed by the network operator because of the Contractor's activities, the Contractor shall organise and carry out his work so as to permit the removal of the restrictions as soon as possible.
- 6.2 When the Contract Supervisor considers protection to be necessary the Contractor shall, unless otherwise agreed, provide all protection including flagmen, other personnel and all equipment for the protection of the network operator's and the Contractor's personnel and assets, the public and including trains.
- 6.2.1 The network operator will provide training free of charge of the Contractor's flagmen and other personnel performing protection duties. The Contractor shall consult with the Contract Supervisor, whenever he considers that protection will be necessary, taking into account the minimum permissible clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)
- 6.3 The Contractor shall appoint a Responsible Representative to receive and transmit any instruction which may be given by the network operator personnel providing protection.

7.0 ROADS AND ROADS ON THE NETWORK OPERATOR'S PROPERTY

- 7.1 The Contractor shall take every reasonable precaution to prevent damage to any roads or bridges used to obtain access to the site, and shall select routes, use vehicles, and restrict loads so that any extraordinary traffic as may arise from the moving of plant or material to or from the site shall be limited as far as is reasonably possible.
- 7.2 The Contractor shall not occupy or interfere in any way with the free use of any public or private road, right-of-way, path or street unless the Contract Supervisor has obtained the approval of the road authority concerned.

8.0 CLEARANCES

- 8.1 No temporary works shall encroach on the appropriate minimum clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)

9.0 STACKING OF MATERIAL

- 9.1 The Contractor shall not stack any material closer than 3m from the centre line of any railway line without prior approval of the Contract Supervisor.

10.0 EXCAVATION, SHORING, DEWATERING AND DRAINAGE

- 10.1 Unless otherwise approved by the Contract Supervisor any excavation adjacent to a railway line shall not encroach on the hatched area shown in Figure 1.

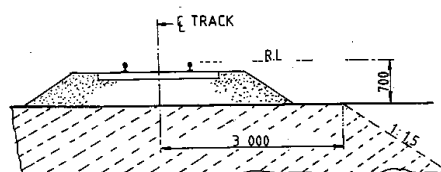


Fig. 1.

- 10.2 The Contractor shall provide, at his own cost any shoring, dewatering or drainage of any excavation unless otherwise stipulated elsewhere in the Contract.
- 10.3 Where required by the Contract Supervisor, drawings of shoring for any excavation under or adjacent to a railway line shall be submitted and permission to proceed, obtained before the excavation is commenced.
- 10.4 The Contractor shall prevent ingress of water to the excavation but where water does enter, he shall dispose of it as directed by the Contract Supervisor.
- 10.5 The Contractor shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with drainage.
- 11.0 FALSEWORK FOR STRUCTURES**
- 11.1 Drawings of falsework for the construction of any structure over, under or adjacent to any railway line shall be submitted to the Contract Supervisor and his permission to proceed obtained before the falsework is erected. Each drawing shall be given a title and a distinguishing number and shall be signed by a registered professional engineer certifying that he has checked the design of the falsework and that the drawings are correct and in accordance with the design.
- 11.2 After the falsework has been erected and before any load is applied, the Contractor shall submit to the Contract Supervisor a certificate signed by a registered professional engineer certifying that he has checked the falsework and that it has been erected in accordance with the drawings. Titles and numbers of the drawings shall be stated in the certificate. Notwithstanding permission given by the Contract Supervisor to proceed, the Contractor shall be entirely responsible for the safety and adequacy of the falsework.
- 12.0 PILING**
- 12.1 The Contract Supervisor will specify the conditions under which piles may be installed on the network operator's property.
- 13.0 UNDERGROUND SERVICES**
- 13.1 No pegs or stakes shall be driven or any excavation made before the Contractor has established that there are no underground services which may be damaged thereby.
- 13.2 Any damage shall be reported immediately to the Contract Supervisor, or to the official in charge at the nearest station, or to the traffic controller in the case of centralised traffic control.
- 14.0 BLASTING AND USE OF EXPLOSIVES**
- 14.1 When blasting within 500m of a railway line, the Contractor shall observe the requirements stipulated in this specification.
- 14.2 No blasting shall be carried out except with the prior written permission of the Contract Supervisor and under such conditions as he may impose.
- 14.3 On electrified lines the Contractor shall also obtain the permission of the Electrical Officer (Contracts) before blasting, and shall give at least 21 days notice of his intention to blast. No blasting shall be done in the vicinity of electrified lines unless a member of the network operator's electrical personnel is present.
- 14.4 The Contractor shall arrange for the supply, transport storage and use of explosives.
- 14.5 The Contractor shall have labour, tools and plant, to the satisfaction of the Contract Supervisor, available on the site to clear immediately any stones or debris deposited on the track or formation by blasting, and to repair any damage to the track or formation immediately after blasting. Repairs to the track shall be carried out only under the supervision of a duly authorised representative of the network operator.
- 14.6 The Contractor shall notify the Contract Supervisor of his intention to blast at least 21 days before the commencement of any blasting operations.
- 14.7 Before any blasting is undertaken, the Contractor and the Contract Supervisor shall jointly examine and measure up any buildings, houses or structures in the vicinity of the proposed blasting to establish the extent of any existing cracking or damage to such structures, etc. The Contractor, shall, subject to the provisions stipulated in the Contract Insurance Policy, make good any deterioration of such buildings, houses, or structures, which, in the opinion of the Contract Supervisor, was directly caused by the blasting.
- 14.8 After completion of the blasting the Contractor shall obtain a written clearance from each landowner in

the vicinity of the blasting operations to the effect that all claims for compensation in respect of damage caused by the blasting operations to their respective properties, have been settled.

14.9 The Contractor shall provide proof that he has complied with the provisions of clauses 10.17.1 to 10.17.4 of the Explosives Regulations (Act 26 of 1956 as amended).

14.10 Blasting within 500m of a railway line will only be permitted during intervals between trains. A person appointed by the Contract Supervisor, assisted by flagmen with the necessary protective equipment, will be in communication with the controlling railway station.

Only this person will be authorised to give the Contractor permission to blast, and the Contractor shall obey his instructions implicitly regarding the time during which blasting may take place.

14.11 The flagmen described in clause 14.10, where provided by the network operator, are for the protection of trains and the network operator's property only, and their presence does not relieve the Contractor in any manner of his responsibilities in terms of Explosives Act or Regulations, or any obligation in terms of this Contract.

14.12 The person described in clause 14.10 will record in a book provided and retained by the network operator, the dates and times:-

(i) when each request is made by him to the controlling station for permission to blast;

(ii) when blasting may take place;

(iii) when blasting actually takes place; and

(iv) when he advises the controlling station that the line is safe for the passage of trains.

14.13 Before each blast the Contractor shall record in the same book, the details of the blast to be carried out. The person appointed by the Contract Supervisor and the person who will do the blasting shall both sign the book whenever an entry described in clause 14.12 is made.

15.0 RAIL TROLLEYS

15.1 The use of rail trolleys or trestle trolleys on a railway line for working on high voltage equipment will be permitted only if approved by the Contract Supervisor and under the conditions stipulated by him.

15.2 All costs in connection with trolley working and any train protection services requested by the Contractor shall, be borne by the Contractor, unless otherwise agreed.

16.0 SIGNAL TRACK CIRCUITS

16.1 Where signal track circuits are installed, the Contractor shall ensure that no material capable of conducting an electrical current makes contact between rails of railway line/lines.

16.2 No signal connections on track-circuited tracks shall be severed without the Contract Supervisor's knowledge and consent.

17.0 PENALTY FOR DELAYS TO TRAINS

17.1 If any trains are delayed by the Contractor and the Contract Supervisor is satisfied that the delay was avoidable, a penalty will be imposed on the Contractor as stipulated in the contract, for the period and number of trains delayed.

18.0 SURVEY BEACONS AND PEGS

18.1 The Contractor shall not on any account move or damage any beacon, bench mark, reference mark, signal or trigonometrical station in the execution of the Works without the written approval of the Contract Supervisor.

Should the Contractor be responsible for any such occurrence, he shall report the circumstances to the Contract Supervisor who will arrange with the Director-General of Surveys for replacement of the beacon or mark at the cost of the Contractor.

18.2 The Contractor shall not move or damage any cadastral or mining beacon without the written approval of the Contract Supervisor and before it has been referenced by a registered land surveyor. Any old boundary beacon, which becomes an internal beacon on creation of new boundaries, shall not be moved without the written approval of the Contract Supervisor.

Should the Contractor move or damage any cadastral or mining beacon without authority, he shall be responsible for having it replaced, at his cost, by a land surveyor.

- 18.3 The Contractor shall preserve all pegs and bench marks. Such survey points shall not be removed without the written approval of the Contract Supervisor. Should any peg or benchmark be removed without authority, the Contract Supervisor will arrange for its replacement and the cost will be recovered from the Contractor. No claim will be considered for delay in replacing any such peg or bench mark. Each peg replaced shall be checked by the Contractor.
- 18.4 Where a new boundary has been established, beacons on the fence line shall not be disturbed, and fence posts or anchors may not be placed or excavations made within 0,6 m of any beacon without the prior written approval of the Contract Supervisor.

19.0 TEMPORARY LEVEL CROSSINGS

- 19.1 The Contract Supervisor may, on request of the Contractor, and if necessary for the purpose of execution of the Works, permit the construction of a temporary level crossing over a railway a line at a position approved by the Contract Supervisor and at the Contractor's cost. The period for which the temporary level crossing is permitted will be at the discretion of the Contract Supervisor.

- 19.2 The Contractor will provide protection and supervise the construction of the road over the track(s) and within the railway servitude at the level crossing, as well as the erection of all road signs and height gauges. All cost to be borne by the applicant.

The Contractor shall exercise extreme caution in carrying out this work, especially in respect of damage to tracks, services, overhead power and communications routes and prevent contact with "live" overhead electrical equipment.

Unless otherwise agreed, the Contractor will provide the service deviations or alterations to the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to accommodate the level crossing.

- 19.3 The Contractor shall take all necessary steps including the provision of gates, locks and, where necessary, watchmen to restrict the use of the temporary level crossing to himself and his employees, his subcontractors and their employees, the staff of the network operator and to such other persons as the Contract Supervisor may permit and of whose identity the Contractor will be advised. If so ordered by the Contract Supervisor, the Contractor shall provide persons to control road traffic using the temporary level crossing. Such persons shall stop all road traffic when any approaching train is within seven hundred and fifty (750) metres of the temporary level crossing, and shall not allow road traffic to proceed over it until the lines are clear.
- 19.4 The Contractor shall maintain the temporary level crossing within the railway servitude in good condition for the period it is in use. A temporary agreement with the road authority to be concluded for the maintenance of the level crossing outside the railway servitude.
- 19.5 When the temporary level crossing is no longer required by the Contractor, or permitted by the network operator, the Contractor shall at his own cost remove it and restore the site and the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to its original condition. Work over the tracks and within the railway servitude will be supervised by the network operator.

20.0 COMPLETION OF THE WORKS

- 20.1 On completion of the works, the Contractor shall remove all the remaining construction plant and material from the site, other than material which is the property of the network operator, and leave the site in a clean, neat and tidy condition. If material and plant is required for the liability and maintenance period the Contract supervisor must authorise it's retention on site.

21.0 PROTECTION OF PERSONS AND PROPERTY

- 21.1 The Contractor shall provide and maintain all lights, guards, barriers, fencing and watchmen when and where necessary or as required by the Contract Supervisor or by any statutory authority, for the protection of the Works and for the safety and convenience of the public.

Red, yellow, green or blue lights may not be used by the Contractor as they can be mistaken for signals. Red, yellow, green or white flags shall only be used for protection by the Contractor. Within the precincts of a port the Contractor shall obtain the permission of the Port Captain before installing any light.

- 21.2 The Contractor shall take all the requisite measures and precautions during the course of the Works to:
- (i) protect the public and property of the public,
 - (ii) protect the property and workmen of both the network operator and the Contractor,
 - (iii) avoid damage to and prevent trespass on adjoining properties, and
 - (iv) ensure compliance with any instruction issued by the Contract Supervisor or other authorised person, and with any stipulation embodied in the contract documents which affects the safety of any person or thing.
- 21.3 The network operator will provide, at its own cost, protection for the safe working of trains during such operations as the Contract Supervisor may consider necessary. Protection by the network operator for any purpose whatsoever, does not absolve the Contractor of his responsibilities in terms of the Contract.
- 21.4 The Contractor shall take all precautions and appoint guards, watchmen and compound managers for prevention of disorder among and misconduct by the persons employed on the Works and by any other persons, whether employees or not, on the work site and for the preservation of the peace and protection of persons and property in the direct neighbourhood. Any relocation of camps because of disorder shall be at the Contractor's expense.
- 21.5 All operations necessary for the execution of the Works, including the provision of any temporary work and camping sites, shall be carried out so as not to cause veldt fires, ground and environmental pollution, soil erosion or restriction of or interference with streams, furrows, drains and water supplies.
- If the original surface of the ground is disturbed in connection with the Works, it shall be made good by the Contractor to the satisfaction of the land owner, occupier or responsible authority.
- 21.6 The Contractor shall take all reasonable steps to minimise noise and disturbance when carrying out the Works, including work permitted outside normal working hours.
- 21.7 Dumping of waste or excess materials by the Contractor shall, in urban areas, be done under the direction and control of, and at sites made available by the local authority. Dumping outside local authority boundaries shall be done only with the express permission and under the direction and control of the Contract Supervisor.
- 21.8 The Contractor shall comply with environmental protection measures and specifications stipulated by the Contract Supervisor and/or local and environmental authorities.
- 22.0 INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES**
- 22.1 The Contractor shall not interfere in any manner whatsoever with an open line, nor shall he carry out any work or perform any act which affects the security, use or safety of an open line except with the authority of the Contract Supervisor and in the presence of a duly authorised representative of the network operator.
- 22.2 The Contractor shall not carry out any work or operate any plant, or place any material whatsoever nearer than three metres from the centre line of any open line except with the written permission of the Contract Supervisor and subject to such conditions as he may impose.
- 22.3 Care must be taken not to interfere with or damage any services such as overhead wire routes, cables or pipes and optical fibre cable, except as provided for the work specified. The Contractor will be held responsible for any damage to or interruption of such services arising from any act or omission on his part or of any of his employees, or persons engaged by him on the Works. The cost of repairing, replacing or restoring the services, as well as all other costs arising from any damage to services, shall be borne by, and will be recovered from the Contractor.
- 22.4 Authority granted by the Contract Supervisor and the presence of an authorised representative of the network operator in terms hereof, shall not relieve the Contractor of his duty to comply with this specification.
- 23.0 ACCESS, RIGHTS-OF-WAY AND CAMPSITES**
- 23.1 Where entry onto the network operator's property is restricted, permission to enter will be given only for the purpose of carrying out the Works and will be subject to the terms and conditions laid down by the network operator.
- 23.2 The Contractor shall arrange for campsites, workplaces and access thereto as well as for any right-of-

way over private property to the site of the Works, and for access within the boundaries of the network operator's property. The owners of private property to be traversed shall be approached and treated with tact and courtesy by the Contractor, who shall, if necessary, obtain a letter of introduction to such property owners from the Contract Supervisor.

The Contractor shall be responsible for the closing of all gates on roads and tracks used by him or his employees. Except with the prior approval of the Contract Supervisor and the owner or occupier of any private land to be traversed, the Contractor shall not cut, lower, damage, remove or otherwise interfere with any fence or gate which is either on the network operator's property or on private property and which restricts access to the Works. Where such approval has been given, the Contractor shall prevent entry of animals or unauthorised persons onto the network operator's or private property, and shall make the fences safe against trespass at the close of each day's work.

- 23.3 The Contractor shall take all reasonable steps to confine the movement of vehicles and plant to the approved right-of-way to minimise damage to property, crops and natural vegetation.
- 23.4 When access is no longer required, and before completion of the Works, the Contractor shall repair, restore or replace any fence or gate damaged during execution of the Works to the satisfaction of the Contract Supervisor and shall furnish the Contract Supervisor with a certificate signed by the owner and occupier of land over which he has gained access to a campsite, workplace and the Works, certifying that the owner and occupier have no claim against the Contractor or the network operator arising from the Contractor's use of the land. Should the Contractor be unable to obtain the required certificate, he shall report the circumstances to the Contract Supervisor.

24.0 SUPERVISION

- 24.1 The Contract Supervisor will provide overall technical superintendence of the Works, and may direct the Contractor in terms of the provisions of the Contract or in respect of any measures which the Contract Supervisor may require for the operations of the network operator, the safety of trains, property and workmen of the network operator, and for the safety of other property and persons. The Contractor shall carry out the directions of the Contract Supervisor. The superintendence exercised by the Contract Supervisor, including any agreement, approval, refusal or withdrawal of any approval given, shall not relieve the Contractor of any of his duties and liabilities under the Contract, and shall not imply any assumption by the network operator or by the Contract Supervisor of the legal and other responsibilities of the Contractor in carrying out the Works.
- 24.2 The Contract Supervisor may delegate to any deputy or other person, any of his duties or functions under the Contract. On receiving notice in writing of such delegation, the Contractor shall recognise and obey the deputy or person to whom any such duties or functions have been delegated as if he were the Contract Supervisor.
- 24.3 The Contractor shall exercise supervision over the Works at all times when work is performed or shall be represented by an agent having full power and authority to act on behalf of the Contractor. Such agent shall be competent and responsible, and have adequate experience in carrying out work of a similar nature to the Works, and shall exercise personal supervision on behalf of the Contractor. The Contract Supervisor shall be notified in writing of such appointment which will be subject to his approval.
- 24.4 The Contractor or his duly authorised agent shall be available on the site at all times while the Works are in progress to receive the orders and directions of the Contract Supervisor.

25.0 HOUSING OF EMPLOYEES

- 25.1 The Contractor shall, where necessary, make his own arrangements for suitable housing of his employees. Where temporary housing is permitted by the Contract Supervisor on any part of the site, the Contractor shall provide suitable sanitation, lighting and potable water supplies in terms of the requirements of the local authority or the current network operator's specification; Minimum Communal Health Requirements in Areas outside the Jurisdiction of a Local Authority - E.4B, as applicable.
- 25.2 Fouling the area inside or outside the network operator's boundaries shall be prevented. The Contractor will be called upon by the Contract Supervisor to dispose of any foul or waste matter generated by the Contractor.

26.0 OPTICAL FIBRE CABLE ROUTES

- 26.1 The Contractor shall not handle, impact, move or deviate any optical fibre cable without prior approval.
- 26.2 Works that in any way affect the optical fibre cable requires prior approval from the Contract Supervisor

who will determine the work method and procedures to be followed.

"Preview Copy Only"

PART B - SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT

27.0 GENERAL

- 27.1 This specification is based on the contents of Transnet's publication ELECTRICAL SAFETY INSTRUCTIONS, as amended, a copy of which will be made available on loan to the Contractor for the duration of the contract.

These instructions apply to all work near "live" high-voltage equipment maintained and/or operated by the network operator, and the onus rests on the Contractor to ensure that he obtains a copy.

- 27.2 This specification must be read in conjunction with and not in lieu of the Electrical Safety Instructions.
- 27.3 The Contractor's attention is drawn in particular to the contents of Part I, Sections 1 and 2 of the Electrical Safety Instructions.
- 27.4 The Electrical Safety Instructions cover the minimum safety precautions which must be taken to ensure safe working on or near high-voltage electrical equipment, and must be observed at all times. Should additional safety measures be considered necessary because of peculiar local conditions, these may be ordered by and at the discretion of the Electrical Officer (Contracts).
- 27.5 The Contractor shall obtain the approval of the Electrical Officer (Contracts) before any work is done which causes or could cause any portion of a person's body or the tools he is using or any equipment he is handling, to come within 3 metres of any "live" high-voltage equipment.
- 27.6 The Contractor shall regard all high-voltage equipment as "live" unless a work permit is in force.
- 27.7 Safety precautions taken or barriers erected shall comply with the requirements of the Electrical Officer (Contracts), and shall be approved by him before the work to be protected is undertaken by the Contractor. The Contractor shall unless otherwise agreed, bear the cost of the provision of the barriers and other safety precautions required, including the attendance of the network operator's staff where this is necessary.
- 27.8 No barrier shall be removed unless authorised by the Electrical Officer (Contracts).

28.0 WORK ON BUILDINGS OR FIXED STRUCTURES

- 28.1 Before any work is carried out or measurements are taken on any part of a building, fixed structure or earthworks of any kind above ground level situated within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted to ascertain the conditions under which the work may be carried out.
- 28.2 No barrier erected to comply with the requirements of the Electrical Officer (Contracts) shall be used as temporary staging or shuttering for any part of the Works.
- 28.3 The shuttering for bridge piers, abutments, retaining walls or parapets adjacent to or over any track may be permitted to serve as a barrier, provided that it extends at least 2,5 metres above any working level in the case of piers, abutments and retaining walls and 1,5 metres above any working level in the case of parapets.

29.0 WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING OR UNLOADING

- 29.1 No person may stand, climb or work, whilst on any platform, surface or foothold:
- 29.1.1 higher than the normal unrestricted access way, namely -
 - 29.1.1.1 external walkways on diesel, steam and electric locomotives, steam heat vans, etc. and
 - 29.1.1.2 walkways between coaches and locomotives.
 - 29.1.2 of restricted access ways in terms of the Electrical Safety Instructions namely -
 - 29.1.2.1 the floor level of open wagons
 - 29.1.2.2 external walkways or decks of road-rail vehicles, on-track maintenance machines and material trains.
 - 29.1.3 Unauthorised staff working on these platforms must be directly supervised by duly authorised persons in terms of clause 607.1.3 of the Electrical Safety Instructions. These persons must attend the relevant electrical safety module training. A letter of training must then be issued by an accredited training authority. A Category C Certificate of Authority must be obtained from the

local depot examining officer.

- 29.2 When in the above positions no person may raise his hands or any equipment he is handling above his head.
- 29.3 In cases where the Contractor operates his own rail mounted equipment, he shall arrange for the walkways on this plant to be inspected by the Electrical Officer (Contracts) and approved, before commencement of work.
- 29.4 The handling of long lengths of material such as metal pipes, reinforcing bars, etc should be avoided, but if essential they shall be handled as nearly as possible in a horizontal position below head height.
- 29.5 The Responsible Representative shall warn all persons under his control of the danger of being near "live" high-voltage equipment, and shall ensure that the warning is fully understood.
- 29.6 Where the conditions in clauses 30.1 to 30.4 cannot be observed the Electrical Officer (Contracts), shall be notified. He will arrange for suitable Safety measures to be taken. The Electrical Officer (Contracts), may in his discretion and in appropriate circumstances, arrange for a suitable employee of the Contractor to be specially trained by the network operator and at the Contractor's cost, as an Authorised Person to work closer than 3 metres from "live" overhead conductors and under such conditions as may be imposed by the senior responsible electrical engineer of the network operator.

30.0 USE OF EQUIPMENT

30.1 Measuring Tapes and Devices

- 30.1.1 Measuring tapes may be used near "live" high-voltage equipment provided that no part of any tape or a person's body comes within 3 metres of the "live" equipment.
- 30.1.2 In windy conditions the distance shall be increased to ensure that if the tape should fall it will not be blown nearer than 3 metres from the "live" high-voltage equipment.
- 30.1.3 Special measuring devices longer than 2 metres such as survey sticks and rods may be used if these are of non-conducting material and approved by the responsible Electrical Engineer of the network operator, but these devices must not be used within 3 metres of "live" high-voltage equipment in rainy or wet conditions.
- 30.1.4 The assistance of the Electrical Officer (Contracts) shall be requested when measurements within the limits defined in clauses 31.1.1 to 31.1.3 are required.
- 30.1.5 The restrictions described in 31.1.1 to 31.1.3 do not apply on a bridge deck between permanent parapets nor in other situations where a barrier effectively prevents contact with the "live" high-voltage equipment.

30.2 Portable Ladders

- 30.2.1 Any type of portable ladder longer than 2 metres may only be used near "live" high-voltage equipment under the direct supervision of the Responsible Representative. He shall ensure that the ladder is always used in such a manner that the distance from the base of the ladder to any "live" high-voltage equipment is greater than the fully extended length of the ladder plus 3 metres. Where these conditions cannot be observed, the Electrical Officer (Contracts) shall be advised, and he will arrange for suitable safety measures to be taken.

31.0 CARRYING AND HANDLING MATERIAL AND EQUIPMENT

- 31.1 Pipes, scaffolding, iron sheets, reinforcing bars and other material which exceeds 2 metres in length shall be carried completely below head height near "live" high-voltage equipment. For maximum safety such material should be carried by two or more persons so as to maintain it as nearly as possible in a horizontal position. The utmost care must be taken to ensure that no part of the material comes within 3 metres of any "live" high-voltage equipment.
- 31.2 Long lengths of wire or cable shall never be run out in conditions where a part of a wire or cable can come within 3 metres of any "live" high-voltage equipment unless the Electrical Officer (Contracts) has been advised and has approved appropriate safety precautions.
- 31.3 The presence of overhead power lines shall always be taken account of especially when communications lines or cables or aerial cables, stay wires, etc. are being erected above ground level.

32.0 PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE, TREES ETC.

- 32.1 A pole may be handled for the purpose of erection or removal near high-voltage equipment under the following conditions:

(i) If the distance between the point at which the pole is to be erected or removed and the nearest "live" high-voltage equipment is more than the length of the pole plus 3 metres, the work shall be supervised by the Responsible Representative.

(ii) If the distance described in (i) is less than the length of the pole plus 3 metres, the Electrical Officer (Contracts) shall be consulted to arrange for an Authorised Person to supervise the work and to ensure that the pole is earthed where possible. The pole shall be kept in contact with the point of erection, and adequate precautions shall be taken to prevent contact with "live" high-voltage equipment.

32.2 The cost of supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

32.3 The provisions of clauses 33.1 and 33.2 shall also apply to the erection or removal of columns, antennae, trees, posts, etc.

33.0 USE OF WATER

33.1 No water shall be used in the form of a jet if it can make contact with any "live" high-voltage equipment or with any person working on such equipment.

34.0 USE OF CONSTRUCTION PLANT

34.1 "Construction plant" entails all types of plant including cranes, piling frames, boring machines, excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

34.2 When work is being undertaken in such a position that it is possible for construction plant or its load to come within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted. He will arrange for an Authorised Person to supervise the work and to ensure that the plant is adequately earthed. The Electrical Officer (Contracts) will decide whether further safety measures are necessary.

34.3 The cost of any supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

34.4 When loads are handled by cranes, non-metallic rope hand lines shall be used, affixed to such loads so as to prevent their swinging and coming within 3 metres of "live" high-voltage equipment.

34.5 Clauses 35.1 to 35.4 shall apply *mutatis mutandis* to the use of maintenance machines of any nature.

35.0 WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT

35.1 If the Responsible Representative finds that the work cannot be done in safety with the high-voltage electrical equipment "live", he shall consult the Electrical Officer (Contracts) who will decide on the action to be taken.

35.2 If a work permit is issued the Responsible Representative shall-

(i) before commencement of work ensure that the limits within which work may be carried out have been explained to him by the Authorised Person who issued the permit to him, and that he fully understands these limits.

(ii) sign portion C of the permit before commencement of work;

(iii) explain to all persons under his control the limits within which work may be carried out, and ensure that they fully understand these limits;

(iv) care for the safety of all persons under his control whilst work is in progress; and

(v) withdraw all personnel under his control from the equipment on completion of the work before he signs portion D of the work permit.

36.0 TRACTION RETURN CIRCUITS IN RAILS

36.1 DANGEROUS CONDITIONS CAN BE CREATED BY REMOVING OR SEVERING ANY BOND.

36.2 Broken rails with an air gap between the ends, and joints at which fishplates are removed under "broken bond" conditions, are potentially lethal. The rails on either side of an air gap between rail ends on electrified lines shall not be touched simultaneously until rendered safe by the network operator personnel.

36.3 The Contractor shall not break any permanent bonds between rails or between rails and any structure. He shall give the Contract Supervisor at least 7 days written notice when removal of such bonds is necessary.

36.4 No work on the track which involves interference with the traction return rail circuit either by cutting or removing the rails, or by removal of bonds shall be done unless the Electrical Officer (Contracts) is consulted. He will take such precautions as may be necessary to ensure continuity of the return circuit before permitting the work to be commenced.

37.0 HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR

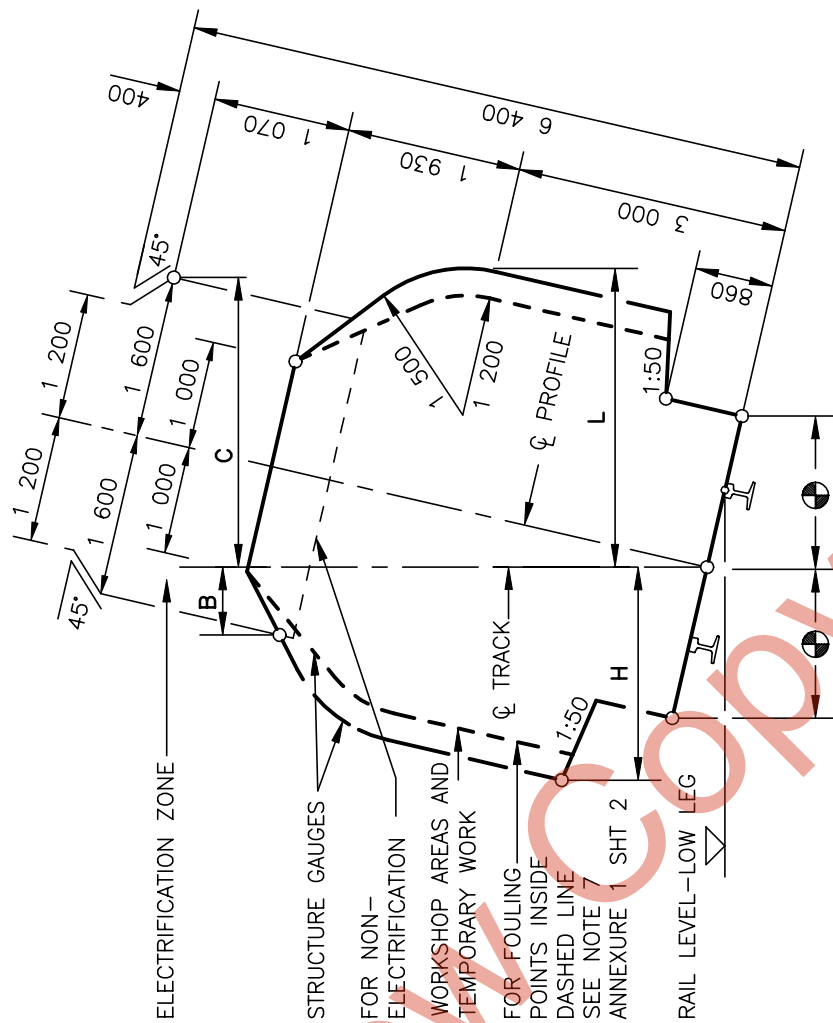
Where the work is undertaken on or near high-voltage electrical equipment which is not maintained and/or operated by the network operator, the Occupational Health and Safety Act No. 85 of 1993, and Regulations and Instructions, or the Mines Health and Safety Act (Act 29 of 1996), shall apply.

Such equipment includes:-

- (i) Eskom and municipal equipment;
- (ii) The Contractor's own power supplies; and
- (iii) Electrical equipment being installed but not yet taken over from the Contractor.


END

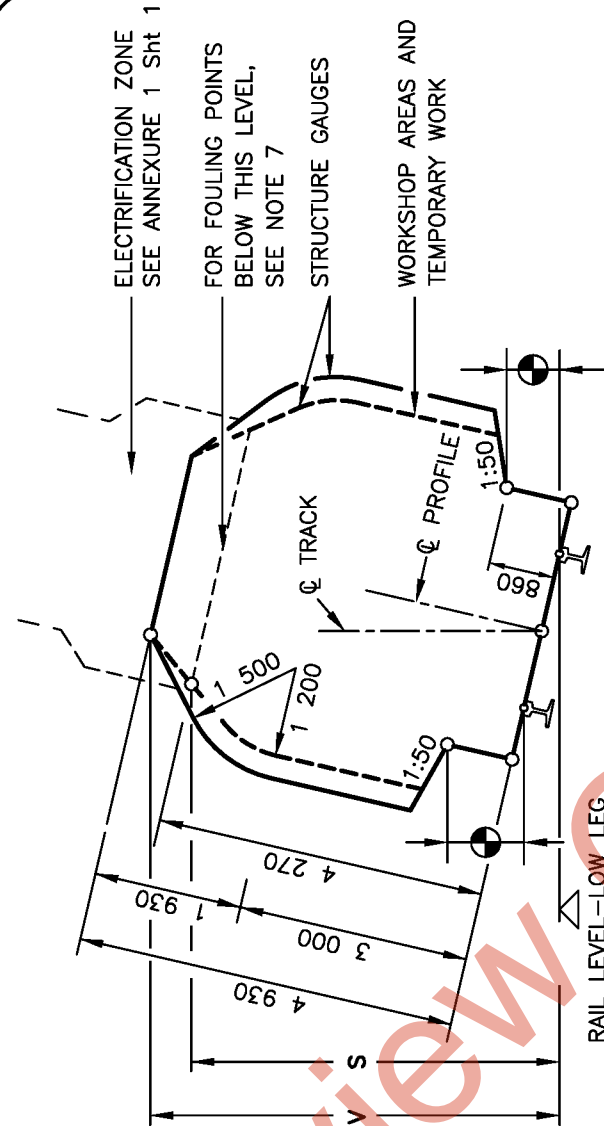
HORIZONTAL CLEARANCES :
1 065mm TRACK GAUGE



RADIUS (m)	WITH CANT		NO CANT	WITH CANT	
	H (mm)	L (mm)		H & L	B (mm)	C (mm)
90	2 730	3 090	2 780	1 130	2 100
100	2 700	3 030	2 750	1 140	2 050
120	2 650	2 970	2 700	1 160	2 010
140	2 620	2 920	2 660	1 175	1 990
170	2 590	2 870	2 630	1 190	1 970
200	2 570	2 820	2 600	1 205	1 950
250	2 550	2 790	2 580	1 230	1 920
300	2 540	2 760	2 560	1 250	1 900
350	2 530	2 730	2 540	1 270	1 890
400	2 520	2 710	2 530	1 290	1 875
500	2 510	2 680	2 520	1 320	1 850
600	2 500	2 660	2 510	1 340	1 830
800	2 490	2 620	2 500	1 365	1 790
1 000	2 480	2 600	2 490	1 380	1 760
1 200	2 480	2 580	2 490	1 200	1 730
1 500	2 480	2 550	2 480	1 415	1 700
2 000	2 480	2 500	2 480	1 440	1 660
3 000	2 470	2 470	2 470	1 500	1 600
>5 000	2 460	2 460	2 460	1 600	1 600

REMARKS:

1. **H** AND **B** IS THE REQUIRED HORIZONTAL CLEARANCE ON THE OUTSIDE OF THE CURVE BASED ON MINIMUM CANT.
2. **L** AND **C** IS THE REQUIRED HORIZONTAL CLEARANCE ON THE INSIDE OF THE CURVE BASED ON MAXIMUM CANT.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR WORKSHOP AREAS AND TEMPORARY WORK, CLEARANCES **H** AND **L** MAY BE REDUCED BY 300mm.
5.  SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.
6. ALSO REFER TO REMARKS 4 TO 8 OF ANNEXURE 1 SHEET 2.



LOCATION	RADIUS (mm)	NOT ELECTRIFIED S (mm)	ELECTRIFIED (PRESENT OR FUTURE)	
			3kV & 25kV V (mm)	50kV V (mm)
ALL AREAS OTHER THAN THOSE INDICATED BY * BELOW	100	4 470	5 050	5 400
	300	4 410	5 020	5 370
	600	4 370	5 000	5 350
	1 000	4 350	4 990	5 340
	1 500	4 310	4 960	5 310
	2 000	4 290	4 940	5 290
	>3 000	4 270	4 930	5 280
* OVER OR NEAR POINTS AND CROSSING IF REQUIRED BY ELECTRICAL IRRESPECTIVE OF RADIUS			5 650	6 000

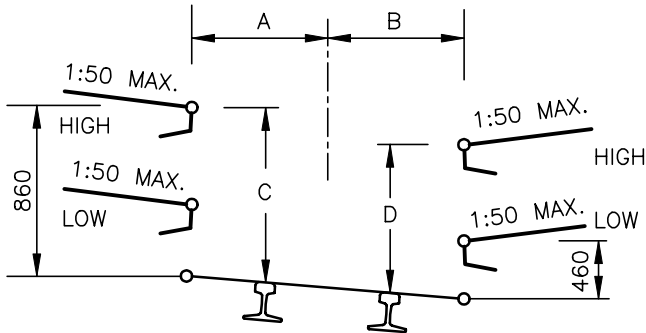
REMARKS:

1. V IS THE REQUIRED VERTICAL CLEARANCE EXCEPT WHERE REDUCED CLEARANCE S APPLIES.
2. S IS THE MINIMUM VERTICAL CLEARANCE FOR STRUCTURES AND TEMPORARY WORK OVER NON-ELECTRIFIED LINES.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR APPLICATION AT CURVES
 - 4.1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 3m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 4.2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 4.3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 15m ALONG STRAIGHTS.
5. NEW STRUCTURES: SEE BRIDGE CODE.
6. TUNNELS: SEE DRAWING BE 82-35.
7. FOULING POINTS: SEE CLAUSE 8.1.
8. CLEARANCES ARE BASED ON 15m BOGIE CENTRES AND 21.2m VEHICLE BODY LENGTH.
9. SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.

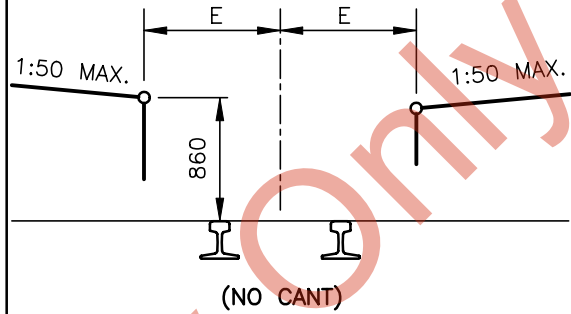
CLEARANCES : PLATFORMS

PLATFORMS : TRACK GAUGE 1 065mm

PASSENGERS



GOODS

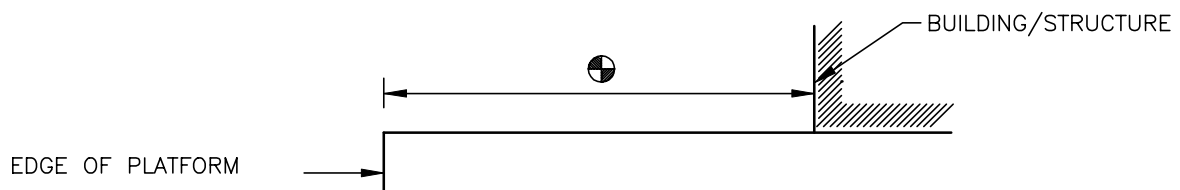


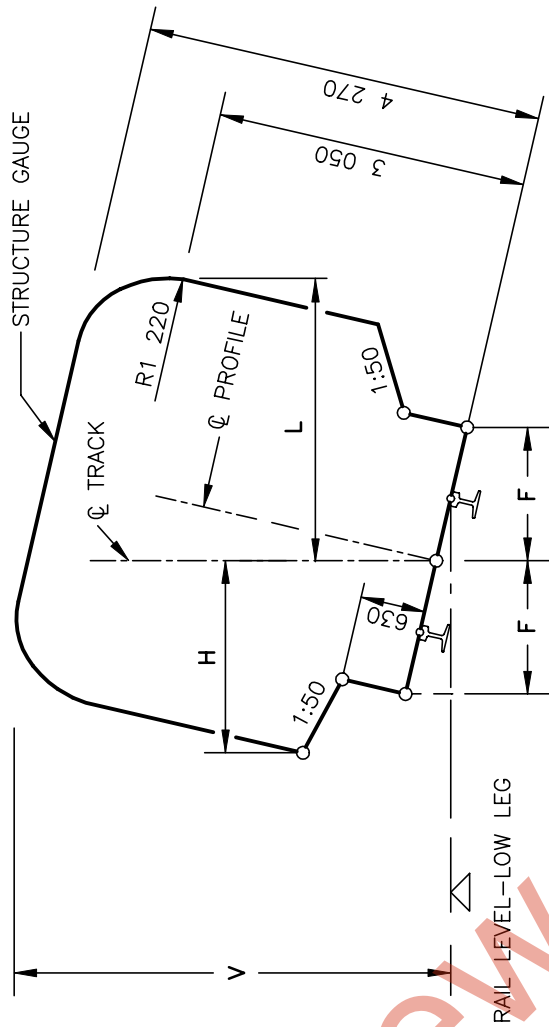
RADIUS (m)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
90	1 690	1 820	890	810	1 840
100	1 650	1 790	890	810	1 810
120	1 610	1 740	890	810	1 760
140	1 580	1 700	890	810	1 720
170	1 550	1 660	890	810	1 690
200	1 530	1 630	890	820	1 670
250	1 520	1 600	890	820	1 640
300	1 520	1 580	890	830	1 620
350	1 520	1 560	880	830	1 600
400	1 520	1 550	880	840	1 590
500	1 520	1 540	880	850	1 580
600	1 520	1 530	870	850	1 570
800	1 520	1 520	860	860	1 560
1 200	1 520	1 520	860	860	1 550
2 000	1 520	1 520	860	860	1 540
3 000	1 520	1 520	860	860	1 530
STRAIGHT	1 520	1 520	860	860	1 520

REMARKS:

1. NO CANT TO BE APPLIED EXCEPT WHEN THE GOODS PLATFORM IS ON A RUNNING LINE.
2. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
3. 8m TO MAIN STATION-BUILDINGS AND 3m TO ALL OTHER STRUCTURES.
4. TOLERANCES : SEE CLAUSE 8.0.10.

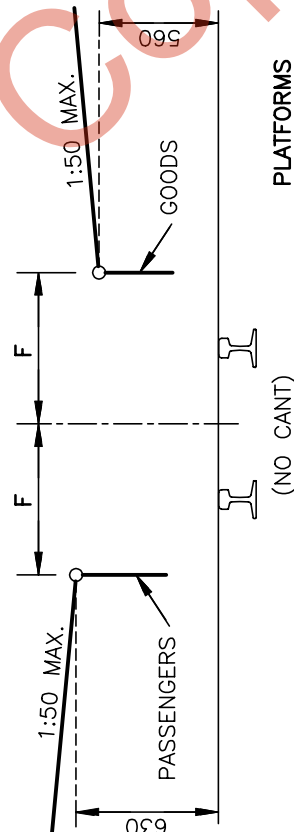
STRUCTURES ON PLATFORMS : 1 065mm AND 610mm TRACK GAUGE





RADIUS (m)	F (mm)
50	1 550
60	1 510
80	1 460
100	1 430
120	1 410
140	1 390
170	1 380
200	1 370
250	1 360
300	1 350
600	1 330
1 000	1 320
>2 000	1 320
STRAIGHT	1 310

CLEARANCES



PLATFORMS

REMARKS:

- H IS THE MINIMUM HORIZONTAL CLEARANCE ON THE OUTSIDE OF THE CURVE BASED ON MINIMUM CANT.
- L IS THE MINIMUM HORIZONTAL CLEARANCE ON THE INSIDE OF THE CURVE BASED ON MAXIMUM CANT.
- V IS THE MINIMUM VERTICAL CLEARANCE.
- FOR APPLICATION AT CURVES:
 - 1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 2m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 18m ALONG STRAIGHTS.
- INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
- ALSO REFER TO REMARKS 5, 6 AND 7 OF ANNEXURE 1 SHEET 2.
- CLEARANCES ARE BASED ON 9 700mm BOGIE CENTRES AND 13 700mm VEHICLE BODY LENGTH.
- SEE ANNEXURE 1 SHEET 3 FOR STRUCTURES ON PLATFORMS.

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT





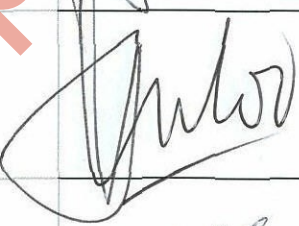

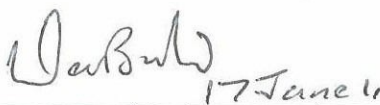

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

(This page not to be issued with contract)

SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

Author:	Project Manager Capital Program (Electrical)	G. Maposa	
Approved:	Senior Engineer Infra Engineering (Train Authorisation Systems)	J. van den Berg	
"	Principal Engineer Infra Engineering (Track)	M. Marutla	
"	Principal Engineer Infra Engineering (Structures)	J. Homan	
"	Principal Engineer Infra Engineering (Electrical)	J. Vosloo	
"	Principal Engineer Technology Management (Electrical)	W. Coetzee	
"	Chief Engineer Transport Telecoms	D. Botha	 17 June 11
Authorised:	Chief Engineer Infrastructure Engineering	J. van Aardt	 2011/06/30

Date:

May 2011

(This page not to be issued with contract)

TRANSNET



Transnet SOC Limited Registration Number 1990/00900/06

TRANSNET SPECIFICATION

E7/1 - SPECIFICATION FOR GENERAL WORK AND WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR HIGH VOLTAGE EQUIPMENT

(This specification shall be used in network operator contracts)

Circulation Not Restricted

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet SOC Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

CONTENTS

<u>CLAUSE</u>	<u>HEADING</u>	<u>PAGE</u>
1.0	SCOPE	3
2.0	DEFINITIONS	3
PART A - GENERAL SPECIFICATION		
3.0	AUTHORITY OF OFFICERS OF TRANSNET	4
4.0	CONTRACTOR'S REPRESENTATIVES AND STAFF	4
5.0	OCCUPATIONS AND WORK PERMITS	4
6.0	SPEED RESTRICTIONS AND PROTECTION	5
7.0	ROADS ON THE NETWORK OPERATOR'S PROPERTY	5
8.0	CLEARANCES	5
9.0	STACKING OF MATERIAL	5
10.0	EXCAVATION, SHORING, DEWATERING AND DRAINAGE	5
11.0	FALSEWORK FOR STRUCTURES	6
12.0	PILING	6
13.0	UNDERGROUND SERVICES	6
14.0	BLASTING AND USE OF EXPLOSIVES	6
15.0	RAIL TROLLEYS	7
16.0	SIGNAL TRACK CIRCUITS	7
17.0	PENALTY FOR DELAYS TO TRAINS	7
18.0	SURVEY BEACONS AND PEGS	7
19.0	TEMPORARY LEVEL CROSSINGS	8
20.0	COMPLETION OF THE WORKS	8
21.0	PROTECTION OF PERSONS AND PROPERTY	9
22.0	INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES	10
23.0	ACCESS, RIGHTS-OF-WAY AND CAMPSITES	10
24.0	SUPERVISION	10
25.0	HOUSING OF EMPLOYEES	10
26.0	OPTICAL FIBRE CABLE ROUTES	10
PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT		
27.0	GENERAL	11
28.0	WORK ON BUILDINGS OR FIXED STRUCTURES	11
29.0	WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING AND UNLOADING	11
30.0	USE OF EQUIPMENT	12
31.0	CARRYING AND HANDLING MATERIAL AND EQUIPMENT	12
32.0	PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE AND TREES ETC.	12
33.0	USE OF WATER	13
34.0	USE OF CONSTRUCTION PLANT	13
35.0	WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT	13
36.0	TRACTION RETURN CIRCUITS IN RAILS	13
37.0	HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR	14

1.0 SCOPE

- 1.1 This specification covers the network operator's requirements for general work and works on, over, under or adjacent to railway lines and near high voltage equipment.

2.0 DEFINITIONS

The following definitions shall apply:

"Authorised Person" - A person whether an employee of the network operator or not, who has been specially authorised to undertake specific duties in terms of Transnet' publication Electrical Safety Instructions, and who holds a certificate or letter of authority to that effect.

"Barrier" Any device designed to restrict access to "live" high-voltage electrical equipment.

"Bond" - A short conductor installed to provide electrical continuity.

"Contractor" - Any person or organisation appointed by the network operator to carry out work on its behalf.

"Contract Supervisor" - The person or juristic person appointed by the network operator from time to time as the Contract Supervisor, to administer the Contractor's performance and execution of the Works according to the powers and rights held by and obligations placed upon the Contract Supervisor in terms of the Contract.

"Dead" - Isolated and earthed.

"Electrical Officer (Contracts)" - The person appointed in writing by the Project Manager in terms of this specification as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

"Executive Officer" - The person appointed by the network operator from time to time as the Executive Officer to act according to the rights and powers held by and obligations placed upon him in terms of the Contract.

"High-Voltage" - A voltage normally exceeding 1000 volts.

"Live" - A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

"Near" - To be in such a position that a person's body or the tools he is using or any equipment he is handling may come within 3 metres of "live" exposed high-voltage electrical equipment.

"Occupation" - An authorisation granted by the network operator for work to be carried out under specified conditions on, over, under or adjacent to railway lines.

"Occupation Between Trains" - An occupation during an interval between successive trains.

"Optical Fibre Cable" - Buried or suspended composite cable containing optical fibres used in:

- telecommunication networks for transmission of digital information and
- safety sensitive train operations systems.

"Project Manager" - As defined in the special conditions of the contract. The person or juristic person appointed by the network operator from time to time as the Project Manager, to administer the Contract according to the powers and rights held by and obligations placed upon him in terms of the Contract.

"Responsible Representative" - The responsible person in charge, appointed by a contractor, who has undergone specific training (and holds a certificate) to supervise (general or direct) staff under his control who perform general work or to work on, over, under or adjacent to railway lines and in the vicinity of high-voltage electrical equipment.

"Total Occupation" - An occupation for a period when trains are not to traverse the section of line covered by the occupation.

"Work on" - Work undertaken on or so close to the equipment that the specified working clearances to the "live" equipment cannot be maintained.

"Work Permit" - A combined written application and authority to proceed with work on or near dead electrical equipment.

"Works" - The contractual intent for the work to be done as defined in the contract at a defined work site.

PART A - GENERAL SPECIFICATION

3.0 AUTHORITY OF OFFICERS OF TRANSNET

- 3.1 The Contractor shall co-operate with the officers of the network operator and shall comply with all instructions issued and restrictions imposed with respect to the Works which bear on the existence and operation of the network operator's railway lines and high-voltage equipment.
- 3.2 Without limiting the generality of the provisions of clause 3.1, any duly authorised representative of the network operator, having identified himself, may stop the work if, in his opinion, the safe passage of trains or the safety of the network operator's assets or any person is affected. **CONSIDERATIONS OF SAFETY SHALL TAKE PRECEDENCE OVER ALL OTHER CONSIDERATIONS.**

4.0 CONTRACTOR'S REPRESENTATIVES AND STAFF

- 4.1 The Contractor shall nominate Responsible Representatives of whom at least one shall be available at any hour for call-out in cases of emergency. The Contractor shall provide the Contract Supervisor with the names, addresses and telephone numbers of the representatives.
- 4.2 The Contractor guarantees that he has satisfied himself that the Responsible Representative is fully conversant with this specification and that he shall comply with all his obligations in respect thereof.
- 4.3 The Contractor shall ensure that all contractor staff receives relevant awareness, educational and competence training regarding safety as prescribed.

5.0 OCCUPATIONS AND WORK PERMITS

- 5.1 Work to be done during total occupation or during an occupation between trains or under a work permit shall be done in a manner decided by the Contract Supervisor and at times to suit the network operator requirements.
- 5.2 The Contractor shall organise the Works in a manner which will minimise the number and duration of occupations and work permits required.
- 5.3 The network operator will not be liable for any financial or other loss suffered by the Contractor arising from his failure to complete any work scheduled during the period of an occupation or work permit.
- 5.4 The Contractor shall submit to the Contract Supervisor, in writing, requests for occupations or work permits together with details of the work to be undertaken, at least 21 days before they are required. The network operator does not undertake to grant an occupation or work permit for any particular date, time or duration.
- 5.5 The network operator reserves the right to cancel any occupation or work permit at any time before or during the period of occupation or work permit. If, due to cancellation or change in date or time, the Contractor is not permitted to start work under conditions of total occupation or work permit at the time arranged, all costs caused by the cancellation shall be born by the Contractor except as provided for in clauses 5.6 to 5.8.
- 5.6 When the Contractor is notified less than 2 hours before the scheduled starting time that the occupation or work permit is cancelled, he may claim reimbursement of his direct financial losses caused by the loss of working time up to the time his labour and plant are employed on other work, but not exceeding the period of the cancelled occupation or work permit.
- 5.7 When the Contractor is notified less than 2 hours before the scheduled starting time, or during an occupation or work permit, that the duration of the occupation or work permit is reduced, he may claim reimbursement of his direct financial losses caused by the loss of working time due to the reduced duration of the occupation or work permit.
- 5.8 Reimbursement of the Contractor for any loss of working time in terms of clause 5.6 and 5.7, shall be subject to his claims being submitted within 14 days of the event with full details of labour and plant involved, and provided that the Contract Supervisor certifies that no other work on which the labour and plant could be employed was immediately available.
- 5.9 Before starting any work for which an occupation has been arranged, the Contractor shall obtain from the Contract Supervisor written confirmation of the date, time and duration of the occupation.
- 5.10 Before starting any work for which a work permit has been arranged, the Responsible Representative shall read and sign portion C of the Work Permit, signifying that he is aware of the work boundaries within which work may be undertaken. After the work for which the permit was granted has been completed, or when the

work permit is due to be terminated, or if the permit is cancelled after the start, the same person who signed portion C shall sign portion D of the Work Permit, thereby acknowledging that he is aware that the electrical equipment is to be made "live". The Contractor shall advise all his workmen accordingly.

6.0 SPEED RESTRICTIONS AND PROTECTION

- 6.1 When speed restrictions are imposed by the network operator because of the Contractor's activities, the Contractor shall organise and carry out his work so as to permit the removal of the restrictions as soon as possible.
- 6.2 When the Contract Supervisor considers protection to be necessary the Contractor shall, unless otherwise agreed, provide all protection including flagmen, other personnel and all equipment for the protection of the network operator's and the Contractor's personnel and assets, the public and including trains.
- 6.2.1 The network operator will provide training free of charge of the Contractor's flagmen and other personnel performing protection duties. The Contractor shall consult with the Contract Supervisor, whenever he considers that protection will be necessary, taking into account the minimum permissible clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)
- 6.3 The Contractor shall appoint a Responsible Representative to receive and transmit any instruction which may be given by the network operator personnel providing protection.

7.0 ROADS AND ROADS ON THE NETWORK OPERATOR'S PROPERTY

- 7.1 The Contractor shall take every reasonable precaution to prevent damage to any roads or bridges used to obtain access to the site, and shall select routes, use vehicles, and restrict loads so that any extraordinary traffic as may arise from the moving of plant or material to or from the site shall be limited as far as is reasonably possible.
- 7.2 The Contractor shall not occupy or interfere in any way with the free use of any public or private road, right-of-way, path or street unless the Contract Supervisor has obtained the approval of the road authority concerned.

8.0 CLEARANCES

- 8.1 No temporary works shall encroach on the appropriate minimum clearances set out in the Manual for Track Maintenance (Document no. BBB0481):
- Drawing no. BE-97 Sheet 1: Horizontal Clearances: 1065mm gauge (Annexure 1 sheet 1)
 - Drawing no. BE-97 Sheet 2: Vertical Clearances: 1065mm gauge (Annexure 1 sheet 2)
 - Drawing no. BE-97 Sheet 3: Clearances: Platform (Annexure 1 sheet 3)
 - Drawing no. BE-97 Sheet 5: Clearances: 610mm Gauge (Annexure 1 sheet 5)

9.0 STACKING OF MATERIAL

- 9.1 The Contractor shall not stack any material closer than 3m from the centre line of any railway line without prior approval of the Contract Supervisor.

10.0 EXCAVATION, SHORING, DEWATERING AND DRAINAGE

- 10.1 Unless otherwise approved by the Contract Supervisor any excavation adjacent to a railway line shall not encroach on the hatched area shown in Figure 1.

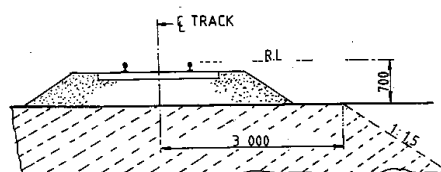


Fig. 1.

- 10.2 The Contractor shall provide, at his own cost any shoring, dewatering or drainage of any excavation unless otherwise stipulated elsewhere in the Contract.
- 10.3 Where required by the Contract Supervisor, drawings of shoring for any excavation under or adjacent to a railway line shall be submitted and permission to proceed, obtained before the excavation is commenced.
- 10.4 The Contractor shall prevent ingress of water to the excavation but where water does enter, he shall dispose of it as directed by the Contract Supervisor.
- 10.5 The Contractor shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with drainage.
- 11.0 FALSEWORK FOR STRUCTURES**
- 11.1 Drawings of falsework for the construction of any structure over, under or adjacent to any railway line shall be submitted to the Contract Supervisor and his permission to proceed obtained before the falsework is erected. Each drawing shall be given a title and a distinguishing number and shall be signed by a registered professional engineer certifying that he has checked the design of the falsework and that the drawings are correct and in accordance with the design.
- 11.2 After the falsework has been erected and before any load is applied, the Contractor shall submit to the Contract Supervisor a certificate signed by a registered professional engineer certifying that he has checked the falsework and that it has been erected in accordance with the drawings. Titles and numbers of the drawings shall be stated in the certificate. Notwithstanding permission given by the Contract Supervisor to proceed, the Contractor shall be entirely responsible for the safety and adequacy of the falsework.
- 12.0 PILING**
- 12.1 The Contract Supervisor will specify the conditions under which piles may be installed on the network operator's property.
- 13.0 UNDERGROUND SERVICES**
- 13.1 No pegs or stakes shall be driven or any excavation made before the Contractor has established that there are no underground services which may be damaged thereby.
- 13.2 Any damage shall be reported immediately to the Contract Supervisor, or to the official in charge at the nearest station, or to the traffic controller in the case of centralised traffic control.
- 14.0 BLASTING AND USE OF EXPLOSIVES**
- 14.1 When blasting within 500m of a railway line, the Contractor shall observe the requirements stipulated in this specification.
- 14.2 No blasting shall be carried out except with the prior written permission of the Contract Supervisor and under such conditions as he may impose.
- 14.3 On electrified lines the Contractor shall also obtain the permission of the Electrical Officer (Contracts) before blasting, and shall give at least 21 days notice of his intention to blast. No blasting shall be done in the vicinity of electrified lines unless a member of the network operator's electrical personnel is present.
- 14.4 The Contractor shall arrange for the supply, transport storage and use of explosives.
- 14.5 The Contractor shall have labour, tools and plant, to the satisfaction of the Contract Supervisor, available on the site to clear immediately any stones or debris deposited on the track or formation by blasting, and to repair any damage to the track or formation immediately after blasting. Repairs to the track shall be carried out only under the supervision of a duly authorised representative of the network operator.
- 14.6 The Contractor shall notify the Contract Supervisor of his intention to blast at least 21 days before the commencement of any blasting operations.
- 14.7 Before any blasting is undertaken, the Contractor and the Contract Supervisor shall jointly examine and measure up any buildings, houses or structures in the vicinity of the proposed blasting to establish the extent of any existing cracking or damage to such structures, etc. The Contractor, shall, subject to the provisions stipulated in the Contract Insurance Policy, make good any deterioration of such buildings, houses, or structures, which, in the opinion of the Contract Supervisor, was directly caused by the blasting.
- 14.8 After completion of the blasting the Contractor shall obtain a written clearance from each landowner in

the vicinity of the blasting operations to the effect that all claims for compensation in respect of damage caused by the blasting operations to their respective properties, have been settled.

- 14.9 The Contractor shall provide proof that he has complied with the provisions of clauses 10.17.1 to 10.17.4 of the Explosives Regulations (Act 26 of 1956 as amended).
- 14.10 Blasting within 500m of a railway line will only be permitted during intervals between trains. A person appointed by the Contract Supervisor, assisted by flagmen with the necessary protective equipment, will be in communication with the controlling railway station.
- Only this person will be authorised to give the Contractor permission to blast, and the Contractor shall obey his instructions implicitly regarding the time during which blasting may take place.
- 14.11 The flagmen described in clause 14.10, where provided by the network operator, are for the protection of trains and the network operator's property only, and their presence does not relieve the Contractor in any manner of his responsibilities in terms of Explosives Act or Regulations, or any obligation in terms of this Contract.
- 14.12 The person described in clause 14.10 will record in a book provided and retained by the network operator, the dates and times:-
- (i) when each request is made by him to the controlling station for permission to blast;
 - (ii) when blasting may take place;
 - (iii) when blasting actually takes place; and
 - (iv) when he advises the controlling station that the line is safe for the passage of trains.
- 14.13 Before each blast the Contractor shall record in the same book, the details of the blast to be carried out. The person appointed by the Contract Supervisor and the person who will do the blasting shall both sign the book whenever an entry described in clause 14.12 is made.

15.0 RAIL TROLLEYS

- 15.1 The use of rail trolleys or trestle trolleys on a railway line for working on high voltage equipment will be permitted only if approved by the Contract Supervisor and under the conditions stipulated by him.
- 15.2 All costs in connection with trolley working and any train protection services requested by the Contractor shall, be borne by the Contractor, unless otherwise agreed.

16.0 SIGNAL TRACK CIRCUITS

- 16.1 Where signal track circuits are installed, the Contractor shall ensure that no material capable of conducting an electrical current makes contact between rails of railway line/lines.
- 16.2 No signal connections on track-circuited tracks shall be severed without the Contract Supervisor's knowledge and consent.

17.0 PENALTY FOR DELAYS TO TRAINS

- 17.1 If any trains are delayed by the Contractor and the Contract Supervisor is satisfied that the delay was avoidable, a penalty will be imposed on the Contractor as stipulated in the contract, for the period and number of trains delayed.

18.0 SURVEY BEACONS AND PEGS

- 18.1 The Contractor shall not on any account move or damage any beacon, bench mark, reference mark, signal or trigonometrical station in the execution of the Works without the written approval of the Contract Supervisor.

Should the Contractor be responsible for any such occurrence, he shall report the circumstances to the Contract Supervisor who will arrange with the Director-General of Surveys for replacement of the beacon or mark at the cost of the Contractor.

- 18.2 The Contractor shall not move or damage any cadastral or mining beacon without the written approval of the Contract Supervisor and before it has been referenced by a registered land surveyor. Any old boundary beacon, which becomes an internal beacon on creation of new boundaries, shall not be moved without the written approval of the Contract Supervisor.

Should the Contractor move or damage any cadastral or mining beacon without authority, he shall be responsible for having it replaced, at his cost, by a land surveyor.

- 18.3 The Contractor shall preserve all pegs and bench marks. Such survey points shall not be removed without the written approval of the Contract Supervisor. Should any peg or benchmark be removed without authority, the Contract Supervisor will arrange for its replacement and the cost will be recovered from the Contractor. No claim will be considered for delay in replacing any such peg or bench mark. Each peg replaced shall be checked by the Contractor.
- 18.4 Where a new boundary has been established, beacons on the fence line shall not be disturbed, and fence posts or anchors may not be placed or excavations made within 0,6 m of any beacon without the prior written approval of the Contract Supervisor.

19.0 TEMPORARY LEVEL CROSSINGS

- 19.1 The Contract Supervisor may, on request of the Contractor, and if necessary for the purpose of execution of the Works, permit the construction of a temporary level crossing over a railway a line at a position approved by the Contract Supervisor and at the Contractor's cost. The period for which the temporary level crossing is permitted will be at the discretion of the Contract Supervisor.

- 19.2 The Contractor will provide protection and supervise the construction of the road over the track(s) and within the railway servitude at the level crossing, as well as the erection of all road signs and height gauges. All cost to be borne by the applicant.

The Contractor shall exercise extreme caution in carrying out this work, especially in respect of damage to tracks, services, overhead power and communications routes and prevent contact with "live" overhead electrical equipment.

Unless otherwise agreed, the Contractor will provide the service deviations or alterations to the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to accommodate the level crossing.

- 19.3 The Contractor shall take all necessary steps including the provision of gates, locks and, where necessary, watchmen to restrict the use of the temporary level crossing to himself and his employees, his subcontractors and their employees, the staff of the network operator and to such other persons as the Contract Supervisor may permit and of whose identity the Contractor will be advised. If so ordered by the Contract Supervisor, the Contractor shall provide persons to control road traffic using the temporary level crossing. Such persons shall stop all road traffic when any approaching train is within seven hundred and fifty (750) metres of the temporary level crossing, and shall not allow road traffic to proceed over it until the lines are clear.
- 19.4 The Contractor shall maintain the temporary level crossing within the railway servitude in good condition for the period it is in use. A temporary agreement with the road authority to be concluded for the maintenance of the level crossing outside the railway servitude.
- 19.5 When the temporary level crossing is no longer required by the Contractor, or permitted by the network operator, the Contractor shall at his own cost remove it and restore the site and the network operator's track-, structure-, drainage-, electrical-, telecommunications- and train authorisation systems to its original condition. Work over the tracks and within the railway servitude will be supervised by the network operator.

20.0 COMPLETION OF THE WORKS

- 20.1 On completion of the works, the Contractor shall remove all the remaining construction plant and material from the site, other than material which is the property of the network operator, and leave the site in a clean, neat and tidy condition. If material and plant is required for the liability and maintenance period the Contract supervisor must authorise it's retention on site.

21.0 PROTECTION OF PERSONS AND PROPERTY

- 21.1 The Contractor shall provide and maintain all lights, guards, barriers, fencing and watchmen when and where necessary or as required by the Contract Supervisor or by any statutory authority, for the protection of the Works and for the safety and convenience of the public.

Red, yellow, green or blue lights may not be used by the Contractor as they can be mistaken for signals. Red, yellow, green or white flags shall only be used for protection by the Contractor. Within the precincts of a port the Contractor shall obtain the permission of the Port Captain before installing any light.

- 21.2 The Contractor shall take all the requisite measures and precautions during the course of the Works to:
- (i) protect the public and property of the public,
 - (ii) protect the property and workmen of both the network operator and the Contractor,
 - (iii) avoid damage to and prevent trespass on adjoining properties, and
 - (iv) ensure compliance with any instruction issued by the Contract Supervisor or other authorised person, and with any stipulation embodied in the contract documents which affects the safety of any person or thing.
- 21.3 The network operator will provide, at its own cost, protection for the safe working of trains during such operations as the Contract Supervisor may consider necessary. Protection by the network operator for any purpose whatsoever, does not absolve the Contractor of his responsibilities in terms of the Contract.
- 21.4 The Contractor shall take all precautions and appoint guards, watchmen and compound managers for prevention of disorder among and misconduct by the persons employed on the Works and by any other persons, whether employees or not, on the work site and for the preservation of the peace and protection of persons and property in the direct neighbourhood. Any relocation of camps because of disorder shall be at the Contractor's expense.
- 21.5 All operations necessary for the execution of the Works, including the provision of any temporary work and camping sites, shall be carried out so as not to cause veldt fires, ground and environmental pollution, soil erosion or restriction of or interference with streams, furrows, drains and water supplies.
- If the original surface of the ground is disturbed in connection with the Works, it shall be made good by the Contractor to the satisfaction of the land owner, occupier or responsible authority.
- 21.6 The Contractor shall take all reasonable steps to minimise noise and disturbance when carrying out the Works, including work permitted outside normal working hours.
- 21.7 Dumping of waste or excess materials by the Contractor shall, in urban areas, be done under the direction and control of, and at sites made available by the local authority. Dumping outside local authority boundaries shall be done only with the express permission and under the direction and control of the Contract Supervisor.
- 21.8 The Contractor shall comply with environmental protection measures and specifications stipulated by the Contract Supervisor and/or local and environmental authorities.
- 22.0 INTERFERENCE WITH THE NETWORK OPERATOR'S ASSETS AND WORK ON OPEN LINES**
- 22.1 The Contractor shall not interfere in any manner whatsoever with an open line, nor shall he carry out any work or perform any act which affects the security, use or safety of an open line except with the authority of the Contract Supervisor and in the presence of a duly authorised representative of the network operator.
- 22.2 The Contractor shall not carry out any work or operate any plant, or place any material whatsoever nearer than three metres from the centre line of any open line except with the written permission of the Contract Supervisor and subject to such conditions as he may impose.
- 22.3 Care must be taken not to interfere with or damage any services such as overhead wire routes, cables or pipes and optical fibre cable, except as provided for the work specified. The Contractor will be held responsible for any damage to or interruption of such services arising from any act or omission on his part or of any of his employees, or persons engaged by him on the Works. The cost of repairing, replacing or restoring the services, as well as all other costs arising from any damage to services, shall be borne by, and will be recovered from the Contractor.
- 22.4 Authority granted by the Contract Supervisor and the presence of an authorised representative of the network operator in terms hereof, shall not relieve the Contractor of his duty to comply with this specification.
- 23.0 ACCESS, RIGHTS-OF-WAY AND CAMPSITES**
- 23.1 Where entry onto the network operator's property is restricted, permission to enter will be given only for the purpose of carrying out the Works and will be subject to the terms and conditions laid down by the network operator.
- 23.2 The Contractor shall arrange for campsites, workplaces and access thereto as well as for any right-of-

way over private property to the site of the Works, and for access within the boundaries of the network operator's property. The owners of private property to be traversed shall be approached and treated with tact and courtesy by the Contractor, who shall, if necessary, obtain a letter of introduction to such property owners from the Contract Supervisor.

The Contractor shall be responsible for the closing of all gates on roads and tracks used by him or his employees. Except with the prior approval of the Contract Supervisor and the owner or occupier of any private land to be traversed, the Contractor shall not cut, lower, damage, remove or otherwise interfere with any fence or gate which is either on the network operator's property or on private property and which restricts access to the Works. Where such approval has been given, the Contractor shall prevent entry of animals or unauthorised persons onto the network operator's or private property, and shall make the fences safe against trespass at the close of each day's work.

- 23.3 The Contractor shall take all reasonable steps to confine the movement of vehicles and plant to the approved right-of-way to minimise damage to property, crops and natural vegetation.
- 23.4 When access is no longer required, and before completion of the Works, the Contractor shall repair, restore or replace any fence or gate damaged during execution of the Works to the satisfaction of the Contract Supervisor and shall furnish the Contract Supervisor with a certificate signed by the owner and occupier of land over which he has gained access to a campsite, workplace and the Works, certifying that the owner and occupier have no claim against the Contractor or the network operator arising from the Contractor's use of the land. Should the Contractor be unable to obtain the required certificate, he shall report the circumstances to the Contract Supervisor.

24.0 SUPERVISION

- 24.1 The Contract Supervisor will provide overall technical superintendence of the Works, and may direct the Contractor in terms of the provisions of the Contract or in respect of any measures which the Contract Supervisor may require for the operations of the network operator, the safety of trains, property and workmen of the network operator, and for the safety of other property and persons. The Contractor shall carry out the directions of the Contract Supervisor. The superintendence exercised by the Contract Supervisor, including any agreement, approval, refusal or withdrawal of any approval given, shall not relieve the Contractor of any of his duties and liabilities under the Contract, and shall not imply any assumption by the network operator or by the Contract Supervisor of the legal and other responsibilities of the Contractor in carrying out the Works.
- 24.2 The Contract Supervisor may delegate to any deputy or other person, any of his duties or functions under the Contract. On receiving notice in writing of such delegation, the Contractor shall recognise and obey the deputy or person to whom any such duties or functions have been delegated as if he were the Contract Supervisor.
- 24.3 The Contractor shall exercise supervision over the Works at all times when work is performed or shall be represented by an agent having full power and authority to act on behalf of the Contractor. Such agent shall be competent and responsible, and have adequate experience in carrying out work of a similar nature to the Works, and shall exercise personal supervision on behalf of the Contractor. The Contract Supervisor shall be notified in writing of such appointment which will be subject to his approval.
- 24.4 The Contractor or his duly authorised agent shall be available on the site at all times while the Works are in progress to receive the orders and directions of the Contract Supervisor.

25.0 HOUSING OF EMPLOYEES

- 25.1 The Contractor shall, where necessary, make his own arrangements for suitable housing of his employees. Where temporary housing is permitted by the Contract Supervisor on any part of the site, the Contractor shall provide suitable sanitation, lighting and potable water supplies in terms of the requirements of the local authority or the current network operator's specification; Minimum Communal Health Requirements in Areas outside the Jurisdiction of a Local Authority - E.4B, as applicable.
- 25.2 Fouling the area inside or outside the network operator's boundaries shall be prevented. The Contractor will be called upon by the Contract Supervisor to dispose of any foul or waste matter generated by the Contractor.

26.0 OPTICAL FIBRE CABLE ROUTES

- 26.1 The Contractor shall not handle, impact, move or deviate any optical fibre cable without prior approval.
- 26.2 Works that in any way affect the optical fibre cable requires prior approval from the Contract Supervisor

who will determine the work method and procedures to be followed.

"Preview Copy Only"

PART B - SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT

27.0 GENERAL

- 27.1 This specification is based on the contents of Transnet's publication ELECTRICAL SAFETY INSTRUCTIONS, as amended, a copy of which will be made available on loan to the Contractor for the duration of the contract.

These instructions apply to all work near "live" high-voltage equipment maintained and/or operated by the network operator, and the onus rests on the Contractor to ensure that he obtains a copy.

- 27.2 This specification must be read in conjunction with and not in lieu of the Electrical Safety Instructions.
- 27.3 The Contractor's attention is drawn in particular to the contents of Part I, Sections 1 and 2 of the Electrical Safety Instructions.
- 27.4 The Electrical Safety Instructions cover the minimum safety precautions which must be taken to ensure safe working on or near high-voltage electrical equipment, and must be observed at all times. Should additional safety measures be considered necessary because of peculiar local conditions, these may be ordered by and at the discretion of the Electrical Officer (Contracts).
- 27.5 The Contractor shall obtain the approval of the Electrical Officer (Contracts) before any work is done which causes or could cause any portion of a person's body or the tools he is using or any equipment he is handling, to come within 3 metres of any "live" high-voltage equipment.
- 27.6 The Contractor shall regard all high-voltage equipment as "live" unless a work permit is in force.
- 27.7 Safety precautions taken or barriers erected shall comply with the requirements of the Electrical Officer (Contracts), and shall be approved by him before the work to be protected is undertaken by the Contractor. The Contractor shall unless otherwise agreed, bear the cost of the provision of the barriers and other safety precautions required, including the attendance of the network operator's staff where this is necessary.
- 27.8 No barrier shall be removed unless authorised by the Electrical Officer (Contracts).

28.0 WORK ON BUILDINGS OR FIXED STRUCTURES

- 28.1 Before any work is carried out or measurements are taken on any part of a building, fixed structure or earthworks of any kind above ground level situated within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted to ascertain the conditions under which the work may be carried out.
- 28.2 No barrier erected to comply with the requirements of the Electrical Officer (Contracts) shall be used as temporary staging or shuttering for any part of the Works.
- 28.3 The shuttering for bridge piers, abutments, retaining walls or parapets adjacent to or over any track may be permitted to serve as a barrier, provided that it extends at least 2,5 metres above any working level in the case of piers, abutments and retaining walls and 1,5 metres above any working level in the case of parapets.

29.0 WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING OR UNLOADING

- 29.1 No person may stand, climb or work, whilst on any platform, surface or foothold:
- 29.1.1 higher than the normal unrestricted access way, namely -
 - 29.1.1.1 external walkways on diesel, steam and electric locomotives, steam heat vans, etc. and
 - 29.1.1.2 walkways between coaches and locomotives.
 - 29.1.2 of restricted access ways in terms of the Electrical Safety Instructions namely -
 - 29.1.2.1 the floor level of open wagons
 - 29.1.2.2 external walkways or decks of road-rail vehicles, on-track maintenance machines and material trains.
 - 29.1.3 Unauthorised staff working on these platforms must be directly supervised by duly authorised persons in terms of clause 607.1.3 of the Electrical Safety Instructions. These persons must attend the relevant electrical safety module training. A letter of training must then be issued by an accredited training authority. A Category C Certificate of Authority must be obtained from the

local depot examining officer.

- 29.2 When in the above positions no person may raise his hands or any equipment he is handling above his head.
- 29.3 In cases where the Contractor operates his own rail mounted equipment, he shall arrange for the walkways on this plant to be inspected by the Electrical Officer (Contracts) and approved, before commencement of work.
- 29.4 The handling of long lengths of material such as metal pipes, reinforcing bars, etc should be avoided, but if essential they shall be handled as nearly as possible in a horizontal position below head height.
- 29.5 The Responsible Representative shall warn all persons under his control of the danger of being near "live" high-voltage equipment, and shall ensure that the warning is fully understood.
- 29.6 Where the conditions in clauses 30.1 to 30.4 cannot be observed the Electrical Officer (Contracts), shall be notified. He will arrange for suitable Safety measures to be taken. The Electrical Officer (Contracts), may in his discretion and in appropriate circumstances, arrange for a suitable employee of the Contractor to be specially trained by the network operator and at the Contractor's cost, as an Authorised Person to work closer than 3 metres from "live" overhead conductors and under such conditions as may be imposed by the senior responsible electrical engineer of the network operator.

30.0 USE OF EQUIPMENT

30.1 Measuring Tapes and Devices

- 30.1.1 Measuring tapes may be used near "live" high-voltage equipment provided that no part of any tape or a person's body comes within 3 metres of the "live" equipment.
- 30.1.2 In windy conditions the distance shall be increased to ensure that if the tape should fall it will not be blown nearer than 3 metres from the "live" high-voltage equipment.
- 30.1.3 Special measuring devices longer than 2 metres such as survey sticks and rods may be used if these are of non-conducting material and approved by the responsible Electrical Engineer of the network operator, but these devices must not be used within 3 metres of "live" high-voltage equipment in rainy or wet conditions.
- 30.1.4 The assistance of the Electrical Officer (Contracts) shall be requested when measurements within the limits defined in clauses 31.1.1 to 31.1.3 are required.
- 30.1.5 The restrictions described in 31.1.1 to 31.1.3 do not apply on a bridge deck between permanent parapets nor in other situations where a barrier effectively prevents contact with the "live" high-voltage equipment.

30.2 Portable Ladders

- 30.2.1 Any type of portable ladder longer than 2 metres may only be used near "live" high-voltage equipment under the direct supervision of the Responsible Representative. He shall ensure that the ladder is always used in such a manner that the distance from the base of the ladder to any "live" high-voltage equipment is greater than the fully extended length of the ladder plus 3 metres. Where these conditions cannot be observed, the Electrical Officer (Contracts) shall be advised, and he will arrange for suitable safety measures to be taken.

31.0 CARRYING AND HANDLING MATERIAL AND EQUIPMENT

- 31.1 Pipes, scaffolding, iron sheets, reinforcing bars and other material which exceeds 2 metres in length shall be carried completely below head height near "live" high-voltage equipment. For maximum safety such material should be carried by two or more persons so as to maintain it as nearly as possible in a horizontal position. The utmost care must be taken to ensure that no part of the material comes within 3 metres of any "live" high-voltage equipment.
- 31.2 Long lengths of wire or cable shall never be run out in conditions where a part of a wire or cable can come within 3 metres of any "live" high-voltage equipment unless the Electrical Officer (Contracts) has been advised and has approved appropriate safety precautions.
- 31.3 The presence of overhead power lines shall always be taken account of especially when communications lines or cables or aerial cables, stay wires, etc. are being erected above ground level.

32.0 PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE, TREES ETC.

- 32.1 A pole may be handled for the purpose of erection or removal near high-voltage equipment under the following conditions:

(i) If the distance between the point at which the pole is to be erected or removed and the nearest "live" high-voltage equipment is more than the length of the pole plus 3 metres, the work shall be supervised by the Responsible Representative.

(ii) If the distance described in (i) is less than the length of the pole plus 3 metres, the Electrical Officer (Contracts) shall be consulted to arrange for an Authorised Person to supervise the work and to ensure that the pole is earthed where possible. The pole shall be kept in contact with the point of erection, and adequate precautions shall be taken to prevent contact with "live" high-voltage equipment.

32.2 The cost of supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

32.3 The provisions of clauses 33.1 and 33.2 shall also apply to the erection or removal of columns, antennae, trees, posts, etc.

33.0 USE OF WATER

33.1 No water shall be used in the form of a jet if it can make contact with any "live" high-voltage equipment or with any person working on such equipment.

34.0 USE OF CONSTRUCTION PLANT

34.1 "Construction plant" entails all types of plant including cranes, piling frames, boring machines, excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

34.2 When work is being undertaken in such a position that it is possible for construction plant or its load to come within 3 metres of "live" high-voltage equipment, the Electrical Officer (Contracts) shall be consulted. He will arrange for an Authorised Person to supervise the work and to ensure that the plant is adequately earthed. The Electrical Officer (Contracts) will decide whether further safety measures are necessary.

34.3 The cost of any supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

34.4 When loads are handled by cranes, non-metallic rope hand lines shall be used, affixed to such loads so as to prevent their swinging and coming within 3 metres of "live" high-voltage equipment.

34.5 Clauses 35.1 to 35.4 shall apply *mutatis mutandis* to the use of maintenance machines of any nature.

35.0 WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT

35.1 If the Responsible Representative finds that the work cannot be done in safety with the high-voltage electrical equipment "live", he shall consult the Electrical Officer (Contracts) who will decide on the action to be taken.

35.2 If a work permit is issued the Responsible Representative shall-

(i) before commencement of work ensure that the limits within which work may be carried out have been explained to him by the Authorised Person who issued the permit to him, and that he fully understands these limits.

(ii) sign portion C of the permit before commencement of work;

(iii) explain to all persons under his control the limits within which work may be carried out, and ensure that they fully understand these limits;

(iv) care for the safety of all persons under his control whilst work is in progress; and

(v) withdraw all personnel under his control from the equipment on completion of the work before he signs portion D of the work permit.

36.0 TRACTION RETURN CIRCUITS IN RAILS

36.1 DANGEROUS CONDITIONS CAN BE CREATED BY REMOVING OR SEVERING ANY BOND.

36.2 Broken rails with an air gap between the ends, and joints at which fishplates are removed under "broken bond" conditions, are potentially lethal. The rails on either side of an air gap between rail ends on electrified lines shall not be touched simultaneously until rendered safe by the network operator personnel.

36.3 The Contractor shall not break any permanent bonds between rails or between rails and any structure. He shall give the Contract Supervisor at least 7 days written notice when removal of such bonds is necessary.

36.4 No work on the track which involves interference with the traction return rail circuit either by cutting or removing the rails, or by removal of bonds shall be done unless the Electrical Officer (Contracts) is consulted. He will take such precautions as may be necessary to ensure continuity of the return circuit before permitting the work to be commenced.

37.0 HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY THE NETWORK OPERATOR

Where the work is undertaken on or near high-voltage electrical equipment which is not maintained and/or operated by the network operator, the Occupational Health and Safety Act No. 85 of 1993, and Regulations and Instructions, or the Mines Health and Safety Act (Act 29 of 1996), shall apply.

Such equipment includes:-

- (i) Eskom and municipal equipment;
- (ii) The Contractor's own power supplies; and
- (iii) Electrical equipment being installed but not yet taken over from the Contractor.

END

Bloemfontein Depot

A - TOTALS	
Theron Total	
Oosthuizen Total	
Estoire Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

Bloemfontein Depot

A - TOTALS	
Theron Total	
Patrysdraai Total	
Oosthuizen Total	
Komspruit Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
TOTAL						

C - RATES			
No.	Item	Unit	
			Labour
			Material and Equipment
1	Removal of existing foundations.	Per Breaker	
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker	
3	Dechlorination.	Per Breaker	
TOTAL			

BILL OF QUANTITIES - THERON

[illegible]

BILL OF QUANTITIES - OOSTHUIZEN

[illegible]

* Contractor to determine

BILL OF QUANTITIES - ESTOIRE

[illegible]

* Contractor to determine



BILL OF QUANTITIES - THERON

[illegible]

* Contractor to determine

BILL OF QUANTITIES - OOSTHUIZEN

[illegible]

* Contractor to determine

BILL OF QUANTITIES - ESTOIRE

[illegible]

* Contractor to determine



BILL OF QUANTITIES - THERON

Item No.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	THERON SUBSTATION (132KV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismantle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	•					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and Install Polycarbonate Box.	each	1					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Theron	Total	

* Contractor to determine

* Contractor to determine



BILL OF QUANTITIES - OOSTHUIZEN

* Contractor to determine

BILL OF QUANTITIES - ESTOIRE

[illegible]

* Contractor to determine

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

<p>THIS ISSUE CANCELS SPECIFICATION NO.: CEE.0023.86</p>

SPECIFICATION FOR THE INSTALLATION OF CABLES

This specification covers SpoorNet's requirements for the installation, laying, terminating, jointing, testing and commissioning of the high and low voltage cables.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

INDEX

SECTION	CONTENTS	PAGE NO
1.0	SCOPE	3
2.0	REFERENCE LIST	3
3.0	APPENDICES	4
4.0	DRAWINGS AND INSTRUCTIONS	5
5.0	STANDARD OF WORK	5
6.0	SAFETY INSTRUCTIONS	5
7.0	SURVEYS	5
8.0	EXCAVATIONS	6
9.0	CABLE LAYING	9
10.0	CABLE TERMINATIONS	14
11.0	CABLE JOINTS	15
12.0	COVERING, BACKFILLING AND REINSTATEMENT	17
13.0	MEASUREMENTS	19
14.0	TESTS	19
15.0	GUARANTEE	22

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 1.0 SCOPE
- 1.1 This specification covers Spoornet's requirements for the installation, laying, terminating, jointing, testing and commissioning of high and low voltage cables.
- 2.0 REFERENCE LIST
- The following publications, drawings and documents (latest edition) are referred to herein.
- 2.1 South African Bureau of Standards
- SABS 97 - Impregnated paper insulated electric cables.
- SABS 0142 - Code of practice for the wiring of premises.
- SABS 150 - Polyvinylchloride (PVC) insulated electric cables and flexible cords.
- SABS 763 - Hot-dip (galvanised) zinc coating.
- SABS 1339 - Cross-linked polyethylene insulation of electric cables.
- SABS 1299 - Direct-acting indicating electrical measuring instruments and their accessories.
- 2.2 British Standard Institution
- BS 5467 - Armoured cables with thermosetting insulation for electricity supply.
- BS 6480 - Impregnated paper-insulated cables.
- 2.3 Machinery and Occupational Safety Act, Act No. 6, 1983
- 2.4 Spoornet
- CEE.0012 - Method of Tendering
- CEE.0045 - Painting of steel components of electrical equipment.
- CEE.0089 - Drawings of electrical equipment supplied under electric light and power contracts.
- Safety Instructions - High Voltage Electrical Equipment

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

3.0 APPENDICES

The following appendices form an integral part of this specification.

3.1 Appendix 1 - "Scope of Work"

3.1.1 This appendix specifies the extent of the work required and the order of priorities.

3.2 Appendix 2 - "Drawings".

3.2.1 This appendix lists Spoornets drawings applicable to the installation,

3.2.2 Cable routes indicated on these drawings shall only be a general guide to the contractor.

3.3 Appendix 3 - "Schedule of Items, Estimated Quantities, Unit Rates and Prices".

3.3.1 To ensure a uniform basis for tendering purposes, tenders shall be based on the estimated quantities given in this schedule which shall be completed in full and returned as part of the tender.

Complies/Does not comply

3.3.2 The importance of full completion of this schedule cannot be overstressed as this will constitute the tenderer's quotation.

Complies/Does not comply

3.3.3 Rates specified in this schedule will be applicable if any adjustments to requirements become necessary.

Complies/Does not comply

3.3.4 Any additional items considered to be necessary by the tenderer for the satisfactory completion of the installation and fulfilment of his guarantee shall be added by the tenderer on a similar unit price basis to this schedule and included in his total tendered price.

Complies/Does not comply

3.3.5 Actual quantities required will be based on the final survey by the successful contractor, and payment will be based on the actual measurements.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

4.0 DRAWINGS AND INSTRUCTIONS

4.1 All drawings submitted by the tenderer shall be in accordance with Spoornets Specification No. CEE.0089

Complies/Does not comply

4.2 Where joints and terminations are to be done by others, the contractor shall submit detailed instructions regarding the procedure recommended by the cable manufacturer.

Complies/Does not comply

5.0 STANDARD OF WORK

5.1 The electrical installation shall conform to the requirements of SABS Code of Practice 0142 and shall be to the satisfaction of Spoornet.

Complies/Does not comply

5.2 Galvanising, where specified, shall be in accordance with SABS 763.

Complies/Does not comply

6.0 SAFETY INSTRUCTIONS

6.1 Work on the high voltage equipment shall be carried out in accordance with the Safety Instructions High Voltage Electrical Equipment of Spoornet.

Complies/Does not comply

6.2 All work done must comply with the requirements of the MACHINERY AND OCCUPATIONAL SAFETY ACT, Act No. 6, 1983.

Complies/Does not comply

7.0 SURVEYS

7.1 Pre-installation Route Surveys.

7.1.1 The Contractor shall within 30 days after being awarded the contract, carry out a pre-installation route survey which shall include digging test holes and, guided by the drawings contained in appendix 2, determine a suitable route.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 7.1.2 The contractor shall determine where cables are liable to be subjected to chemical, electrolytic, mechanical or other damage and shall submit his recommendation to the Engineer for approval.

Complies/Does not comply

- 7.1.3 The Contractor shall submit in triplicate plans of the cable routes selected to the Engineer for approval. Plans may be submitted in sections as the survey progresses.

Complies/Does not comply

- 7.1.4 No excavation of any section of the cable route shall commence before the Contractor is in possession of the relevant approved plans and the Engineer has authorised the commencement of work on the section concerned.

Complies/Does not comply

- 7.2 Post Installation Surveys

- 7.2.1 After completion of all cable laying and jointing and before commissioning of any cable the Contractor shall carry out a final "as laid" survey of the cable routes and submit plans on transparencies suitable for reproduction.

Complies/Does not comply

- 7.2.2 The cable route plans shall include the following information :

- 7.2.2.1 Overall length, type, size and voltage of each cable.

- 7.2.2.2 Accurate indication of the position of each cable joint by indicating two distances to each joint from permanent structures.

Complies/Does not comply

- 7.2.2.3 Pipes and chambers provided.

8.0 EXCAVATIONS

- 8.1 Excavations shall be carried out in strict compliance with the specification No. E.7 for works on, over, under or adjacent to a railway line.

Complies/Does not comply

- 8.2 Trenching procedure shall be programmed in advance, approved by the Engineer and shall not be departed from except with the consent of the Engineer.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.3 The Contractor will be advised of any known buried services such as cables, pipes, etc. in the vicinity of the cable route.
- 8.3.1 When trenching the contractor shall take all necessary precautions to prevent damage to underground services.
- Complies/Does not comply
- 8.3.2 On encountering any uncharted service, the Contractor shall promptly advise the Engineer who will give the necessary instructions. Additional excavations shall be paid for at scheduled rates.
- Complies/Does not comply
- 8.4 Should any underground service, water mains, road pavement, drainage system, building or any other structure be damaged by the Contractor's staff, it shall be reported immediately to the Engineer, who shall arrange for the necessary repairs. The Contractor shall be responsible for the cost of repairs.
- Complies/Does not comply
- 8.5 The removal of obstructions along the cable routes shall be subject to the approval of the Engineer and shall be paid for at the agreed rates.
- Complies/Does not comply
- 8.6 The Contractor shall not trench beneath any railway line without departmental supervision. Should the contractor wish to carry out such work, a minimum of 14 working days notice is required by the Engineer to arrange for the necessary supervision. The cost of such supervision shall not be charged to the Contractor.
- Complies/Does not comply
- 8.7 Excavations crossing oil pipe lines shall not commence until an authorised representative is present on site. The Engineer shall be advised 14 days in advance when such excavations will take place.
- Complies/Does not comply
- 8.7.1 Cable crossings of oil pipe lines shall only be at right angles.
- Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.8 Trenches across roads, access ways or foot-paths shall not be left open. If trenching, cable laying and backfilling cannot be done during the same shift, the portion of trench across the full width of the road, etc., must be temporarily backfilled and consolidated sufficiently to carry the traffic concerned without subsidence. Alternatively, adequately strong cover plates shall be laid across the trench.

Complies/Does not comply

- 8.9 Power driven mechanical excavators may be used for trenching operations. SpoorNet shall not be responsible for any damage to other Services in close proximity when using mechanical excavators.

Complies/Does not comply

- 8.10 The Contractor shall provide shuttering in places where the danger exists of the trench collapsing, and causing damage to formations or other nearby structures.

- 8.10.1 Shuttering shall be paid for at scheduled rates.

Complies/Does not comply

- 8.11 Trenches shall be as straight as possible and the bottom of each cable trench shall be firm and of smooth contour without sharp dips or rises which may cause tensile forces in the cable during backfilling.

Complies/Does not comply

- 8.11.1 Trenches shall have no sharp objects which may cause damage to the cable during laying or backfilling.

Complies/Does not comply

- 8.12 The unfinished depth of trenches unless otherwise stated shall be as follows :

- 8.12.1 HV cables and associated pilot cables = 1 000 mm

- 8.12.2 LV cables and separate pilot cables = 750 mm

- 8.13 The width of the trench unless otherwise stated shall be 500 mm for one or two HV cables and associated pilot cables, and shall increase by 300 mm for each additional HV cable and its associated pilot cable.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 8.13.1 The width of the trench at any bend or places where cable slack is required, shall be such that the bending radius of the cables shall not be less than that specified for the particular cable as per specifications SABS 150, SABS 97 and SABS 1339.

Complies/Does not comply

- 8.13.2 Trenching in railway formations shall be in accordance with Spoornet's Chief Civil Engineer's drawing FG 263.

- 8.14 The material excavated from each trench shall be placed in such a manner as to prevent nuisance or damage to adjacent ditches, railway lines, drains, gateways and other properties and shall not interfere with traffic.

Complies/Does not comply

- 8.14.1 Where, owing to certain considerations, this is not possible the excavated materials shall be removed from site and be returned for refilling the trench on completion of laying.

Complies/Does not comply

- 8.15 When excavating close to railway tracks, the ballast must be covered by tarpaulins or other sheeting to prevent soiling.

Complies/Does not comply

- 8.16 Removal of accumulated water or other liquid from trenches shall be done by the Contractor at his expense. The Contractor shall provide all pumps and appliances required to carry out this operation. Water or any other liquid removed shall be disposed of without creating any nuisance or hazard.

Complies/Does not comply

- 8.17 Spoornet reserves the right to alter any cable route or portion thereof prior to cable laying. Payment in respect of any additional work involved shall be at scheduled rates.

Complies/Does not comply

9.0 CABLE LAYING

9.1 General

- 9.1.1 All possible care shall be exercised in handling cables on site.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.1.2 Any drum of cable showing signs of damage shall not be used.
Complies/Does not comply
- 9.1.3 The outer covering of cables shall not be damaged in any way and cables shall not be bent at radii less than allowed by the manufacturer.
Complies/Does not comply
- 9.1.4 When cable is supplied by the contractor, the drums thereof remain the property of the Contractor and shall be removed from the site and disposed of by him.
Complies/Does not comply
- 9.1.5 Cable pulling and laying shall be done manually unless otherwise approved by the Engineer. No cable shall be subjected to a tension exceeding that stipulated by the cable manufacturer.
- 9.2 IN TRENCHES
- 9.2.1 High Voltage cables shall be spaced at a minimum of 300 mm apart (centre to centre).
- 9.2.2 Low Voltage cables shall be spaced at a minimum of 150 mm apart (centre to centre).
- 9.2.3 Pilot cables shall be laid beside the associated power cables.
- 9.2.4 High Voltage and Low Voltage cables (and pilot cables not associated with High Voltage cable) shall be spaced at a minimum of 300 mm apart.
- 9.2.5 Pilot cables, when they are routed separately from their associated power cables, may be run next to one another.
- 9.2.6 Cables shall not be buried on top of each other except where cable runs cross.
- 9.2.7 Where the cable cannot be laid down at the specified depth, prior authority shall be obtained from the Engineer by the Contractor to protect the cable by means of 150 mm diameter half round concrete pipes with 50 mm concrete slab coverings, or other approved methods.
- 9.2.8 Where cables have to be drawn around corners well lubricated skid plates shall be used. The skid plates shall be securely fixed and constantly examined during cable laying operations.
- 9.2.9 Suitable rollers may be used during the laying of cables.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.2.10 Cables shall be visually inspected for damage during and after laying. Any damage shall be reported immediately to the Engineer who will issue the necessary instructions.

Complies/Does not comply

9.3 IN SLEEVE PIPES

- 9.3.1 All cables crossing beneath roads and pavements shall be enclosed in asbestos cement pipes with a minimum internal diameter of 150mm. The Engineer shall be advised timeously of the locations and quantity of pipes to be laid and chambers to be provided by others. Separate lengths of pipe shall be properly jointed.

Complies/Does not comply

- 9.3.2 Pipes shall maintain or exceed the specified cable spacing.

Complies/Does not comply

- 9.3.3 Only one High Voltage cable shall be laid per pipe.

Complies/Does not comply

- 9.3.4 Pipes shall extend at least 1 m on either side of the road- or pavement formations and shall maintain the specified cable depth. All pipes shall be graded for water drainage : the required grade is 1:400.

Complies/Does not comply

- 9.3.5 All cables crossings underneath railway tracks shall be in pipes in accordance with Chief Civil Engineer's drawing FG 263.

9.4 IN DUCTS AND BUILDINGS

- 9.4.1 Concrete ducts and pipes within buildings will be provided by others.

- 9.4.2 Before installing cables, the ducts are to be inspected to ensure that they are suitable and clean as not to damage the cables.

Complies/Does not comply

- 9.4.3 The cables are to be neatly positioned and cross overs are to be avoided.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.4.4 Steel checker plates over ducts will be supplied by others. The tenderer will however be required to cut all the slots for emerging cables. These slots are to be neatly cut and smoothed to avoid damage to the cable.

Complies/Does not comply

- 9.4.5 The Contractor shall supply all cable trays, racks, wooden cleats or other supports required to adequately support cables not laid in ducts.

Complies/Does not comply

- 9.4.6 Cable trays or racks shall be of reinforced glass fibre or steel suitably treated to prevent corrosion, Steel trays, racks and other supports shall be galvanised in accordance with SABS 763 when used within 50 km of the sea or inland exposed conditions.

Complies/Does not comply

9.5 UNDER BRIDGES AND IN TUNNELS

- 9.5.1 Where a cable route can only be against the concrete wall of a bridge or tunnel the cable shall be supported on :

- 9.5.1.1 suitable brackets at 750 mm intervals.

or

- 9.5.1.2 straining wire secured at maximum 1 200 mm intervals.

Complies/Does not comply

- 9.5.2 Brackets shall be of robust design and shall be galvanised and painted in accordance with specification CEE.0045

Complies/Does not comply

- 9.5.3 The height of the cable route on the brackets or strain wire shall be determined and agreed upon on site.

Complies/Does not comply

- 9.5.4 The brackets or strain wire shall be supplied and installed by the contractor.

Complies/Does not comply

9.6 CROSSING OF PIPELINES AND OTHER CABLES

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 9.6.1 Cables shall pass beneath pipelines with a 300 mm minimum clearance between the top of any cable and the bottom of any oil pipe.

Complies/Does not comply

- 9.6.1.1 The level of any cable at an oil pipeline crossing shall be maintained for not less than 3 m on either side of the centre line of the pipeline or on either side of the centre line of the outermost pipelines where there is more than one pipeline on the same route.

Complies/Does not comply

- 9.6.2 Where cables cross communication or signal cables, at least 300 mm of fill shall be provided between the two cables. In addition a concrete slab in accordance with Spoornets drawing No. CEE 55/027367 shall be placed between the two cables parallel to the lower cable.

Complies/Does not comply

9.7 IN RAILWAY FORMATIONS

- 9.7.1 Cables to be accommodated in railway formations shall be laid in accordance with Chief Civil Engineer's drawing No. FG 263.

Complies/Does not comply

9.8 SECURED TO POLES

- 9.8.1 Cables to be terminated at disconnectors (isolators) mounted on wood, concrete or steel poles, shall be clamped onto such structures by means of stainless steel straps applied at such a tension that the cable or cable sheath is not damaged. Straps shall be located at intervals of not more than 1,2 m.

Complies/Does not comply

- 9.8.2 Cables shall be protected by a pipe or boxed section of galvanised steel or other approved material for a distance of 250 mm below and 600 mm above ground level, strapped or screwed to the pole at a minimum of two points and connected to the earth connection, if of steel construction.

Complies/Does not comply

- 9.8.3 Straps and pipes shall be supplied and installed by the Contractor.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

9.9 EXPOSED CONDITIONS

- 9.9.1 Whenever cables enter buildings or tunnels, or where excavations are not permitted down banks or cuts, the exposed portion shall be suitably protected by means of concrete slabs, or suitable steel pipes or boxed sections which shall be galvanised in accordance with SABS 763.

Complies/Does not comply

- 9.9.2 These pipes or boxed sections shall be firmly secured to the bank or cut, at regular intervals.

Complies/Does not comply

- 9.9.3 All such material shall be supplied and installed by the Contractor.

Complies/Does not comply

- 9.9.4 Stake routes shall only be supplied when specifically called for in Appendix 1.

10.0 CABLE TERMINATIONS

10.1 General

- 10.1.1 All cables shall be terminated and connected to the respective equipment, whether provided by the Contractor or by others.

Complies/Does not comply

- 10.1.2 Jumpers between cable end boxes and disconnectors shall either be short enough to be rigidly self supporting, or shall be supported on suitably placed pin insulators.

Complies/Does not comply

- 10.1.3 Termination of cables on outdoor equipment shall not be done during inclement weather conditions.

Complies/Does not comply

- 10.1.4 Both ends of each cable shall be identified by means of embossed stainless steel strips clamped around the cables. The characters shall have a minimum height of 6 mm.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 10.1.5 All materials necessary for cable termination shall be provided by the Contractor.
Complies/Does not comply
- 10.1.6 The contractor shall ensure that correct phase rotation is maintained throughout.
- 10.1.7 Glands of cables terminating on equipment provided with frame leakage protection shall be insulated from the frame by high grade non-deteriorating, non-hygroscopic insulation, at least 2 mm thick, capable of withstanding a test voltage of 4 kV DC for one minute.
Complies/Does not comply
- 10.2 HV Cables
- 10.2.1 The cable armouring shall be bonded with an approved copper bond to the cable end box at one end of the cable only as directed by the Engineer. This bond shall be easily removable for testing purposes.
Complies/Does not comply
- 10.2.2 Where for any reason a cable cannot be terminated, sufficient length of cable shall be left to reach the cable end box position. The cable shall be coiled and buried or otherwise protected. The cable end of paper insulated cables shall be capped immediately with a plumbed lead seal. Other cables shall be sealed with suitable tape.
Complies/Does not comply
- 10.3 LV Cables (and Pilot Cables)
- 10.3.1 All cut ends of cables are to be sealed with suitable tape, or other approved means until they are ready to be terminated.
Complies/Does not comply
- 10.3.2 The cables shall terminate in compression type glands, brass or bronze, suitable for PVC SWA ECC cables.
Complies/Does not comply
- 10.3.2.1 The glands shall be fitted with neoprene shrouds.
Complies/Does not comply
- 11.0 CABLE JOINTS
- 11.1 General

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 11.1.1 Jointing shall be carried out strictly in accordance with the manufacturer's jointing instructions and by artisans thoroughly experienced and competent in jointing the classes of cables used. They shall be adequately supervised to ensure the highest quality of workmanship.
Complies/Does not comply
- 11.1.2 Jointing shall not be carried out during inclement weather.
Complies/Does not comply
- 11.1.3 The cores of cables shall be jointed number to number or colour to colour.
Complies/Does not comply
- 11.1.4 The joints shall not impair the anti-electrolysis characteristics of the cables.
Complies/Does not comply
- 11.1.5 The conductor bridging the armouring shall be adequate to carry the prospective earth fault current.
Complies/Does not comply
- 11.1.6 A through joint shall only be permitted after every full drum length of cable.
Complies/Does not comply
- 11.1.7 Each cable joint shall be identified by a non-corrodible label fixed securely to the top of the joint. Each label shall have stamped on it, in characters having a minimum height of 10 mm, the identification of equipment at each end of the cable concerned.
Complies/Does not comply
- 11.1.8 Spoornet reserves the right to be present during jointing operations to familiarise themselves with any special techniques.
Complies/Does not comply
- 11.1.9 No joint shall be situated inside a cable pipe.
Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 12.0 COVERING, BACKFILLING AND REINSTATEMENT
- 12.1 Filling of trenches shall not commence before the Engineer or his authorised representative has inspected and approved the cables and cable joints in situ in the section of trench concerned.
- Complies/Does not comply
- 12.2 Trenches in railway formations shall be backfilled and reinstated in accordance with SpoorNet's Chief Civil Engineer's drawing No. FG 263.
- Complies/Does not comply
- 12.3 All other trenches shall be backfilled and reinstated as follows:
- 12.3.1 Two 75 mm thick layers of soil sifted through a 6 mm mesh shall be laid directly under and over the cables respectively and consolidated by hand ramming only.
- Complies/Does not comply
- 12.3.1.1 Only soil with a thermal resistivity of 1,5 degrees C.m/watt, or lower may be used for this purpose.
- Complies/Does not comply
- 12.3.1.2 When necessary imported fill shall be arranged by the Contractor and paid for at scheduled rates.
- Complies/Does not comply
- 12.3.2 HV cables shall, where likely to be mechanically damaged as decided by the engineer, be protected by concrete slabs (to Drawing No. CEE 55/027367) to be supplied and laid by the Contractor on top of the sifted soil. These slabs shall be laid close-butt, convex end to concave end, directly above each HV cable throughout the underground portion except where otherwise protected as by pipes, etc. Only unbroken cable protection slabs may be used, and only slabs actually laid will be paid for.
- Complies/Does not comply
- 12.3.3 The minimum dry densities of backfilling after compaction shall be not less than 1 600 kg/cubic metre.
- Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 12.3.4 All excavations made (whether for the purpose of cable laying, joint bays or trial holes) shall be back-filled in 150 mm layers, the earth in each layer being well rammed and consolidated and sufficient allowance being made for settlement. The back-filling shall be completed to the satisfaction of the Engineer. If necessary, water shall be used to obtain the specified compacted density. Any cable damaged during backfilling shall be replaced by the Contractor at his own expense.

Complies/Does not comply

- 12.3.4.1 Backfilling at pipe entries shall be such as not to stress or damage the cable during compaction from the top.

- 12.3.5 A continuous plastic cable warning tape, to drawing No. CEE-MA-307 shall be laid directly above each HV cable, 150 mm below the normal surface level and run for the full length of the cable before completing the back-filling.

Complies/Does not comply

- 12.4 The back filled trench shall be maintained in a thoroughly safe condition by the contractor for the duration of the contract.

Complies/Does not comply

- 12.5 All back filling of road crossings shall be mechanically rammed.

Complies/Does not comply

- 12.6 Final surfacing of roads shall be restored by others unless called for under "Scope of Work", Appendix 1.

Complies/Does not comply

- 12.7 Concrete cable route markers shall be provided and installed by the contractor in accordance with drawing CEE-PK-14.

Complies/Does not comply

- 12.8 Pipes shall be filled with a sand/water mixture to also have a thermal resistivity of 1,5 degrees C.m/watt or lower when dry. The sand used in the mixture shall be chemically tested not to be harmful to the cable outer sheath.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

13.0 MEASUREMENTS

13.1 All measurements for payment purposes shall be made jointly by representatives of the Contractor and SpoorNet and shall be agreed upon by both parties. The Contractor shall be responsible for obtaining the Engineer's signed approval of such measurements.

Complies/Does not comply

13.2 Measurements of cable length shall be made from centre to centre of cable joints and to the cable ends and will exclude any wastage due to jointing and terminating.

Complies/Does not comply

13.3 When cable is drawn through pipes, only the portion remaining in the pipe will be paid for at the rates quoted for "as installed in pipes".

Complies/Does not comply

13.4 Determination of trench volume for measurement purposes shall be based on measured length and specified width and depth. No allowance shall be made where trenches have to be widened at the bottom to accommodate cables, cable joints and protection slabs.

Complies/Does not comply

13.5 The classification of different types of ground for measurement purposes shall be as follows:

13.5.1 Soft rock will be taken as broken or friable rock which can be removed by pick or mechanical excavator or paving breaker. This includes hard clay.

13.5.2 Hard rock will be taken as rock which cannot be removed by a mechanical excavator and requires drilling and blasting or splitting. This includes reinforced or plain concrete.

14.0 TESTS

14.1 The costs of all post-installation tests shall be borne by the Contractor.

Complies/Does not comply

14.2 The Contractor shall be responsible for remedial work necessary due to damages caused during tests.

Complies/Does not comply

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

- 14.3 Spoornet reserves the right to carry out any further tests deemed necessary, using either the Contractor's instruments and equipment or its own, or both. The costs of such tests will not be charged to the Contractor.

Complies/Does not comply

- 14.4 Test instruments shall be of the accuracy class 1.0 or better in accordance with SABS 1229. Calibration certificates from a recognised testing authority shall be available for inspection and shall not be older than one year.

Complies/Does not comply

- 14.5 Time measurements shall be carried out using an approved digital timer.

Complies/Does not comply

- 14.6 The final commissioning site tests will be carried out by Spoornet.

Complies/Does not comply

- 14.6.1 A suitably qualified staff member of the Contractor shall assist Spoornet during the tests and shall carry out any remedial work where necessary.

Complies/Does not comply

- 14.7 The contractor shall notify the Engineer in writing 4 weeks before the commissioning date and shall have carried out the following site tests before such date :

Complies/Does not comply

- 14.7.1 Prove the continuity and insulation resistance of the multicore pilot cables.

Complies/Does not comply

- 14.7.2 Verify that the insulation level between frame and earth of switchboards fitted with frame leakage protection is not reduced by the installation of the cables.

Complies/Does not comply

- 14.7.3 The following voltage withstand tests on each completed cable run:

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

14.7.3.1 Paper insulated cables:

(i) rating up to 12,7/22 kV : test specified in paragraph D-3 of SABS 97.

Complies/Does not comply

(ii) rating 19/33 kV : test specified in paragraph B-3 of BS 6480, Part 1.

Complies/Does not comply

The extruded PVC impermeable serving shall withstand a test voltage of 10 kV DC between armouring and earth for 1 minute.

Complies/Does not comply

The insulation between armouring and lead sheath shall withstand a test voltage of 10 kV DC for 1 minute.

Complies/Does not comply

14.7.3.2 XLPE Insulated Cables:

All cables rated up to 19/33 kV shall be tested as specified in appendix E, clause 1.4, of SABS 1339, and cables rated up to 1,9/3,3 kV shall be tested as specified in appendix B, clause B.6, of BS 5467.

Complies/Does not comply

Note :

Where a new XLPE cable is to be joined to an existing XLPE Cable, the test shall differ, in that a 4 kV DC test voltage shall be applied for one minute between the brass screens of the cores and the armouring. The outer sheath shall withstand a test voltage of 10 kV DC for 1 minute between the armouring and earth.

Complies/Does not comply

14.7.4 PVC insulated cables shall be tested as specified in paragraph D-3 of SABS 150.

Complies/Does not comply

14.7.5 The Contractor shall submit three copies of certified test reports to the Engineer within three weeks after completion of the tests.

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

15.0 GUARANTEE

15.1 All work undertaken by the Contractor shall be subject to a guarantee for a period of one year against faulty and/or inferior workmanship and material.

Complies/Does not comply

15.2 The guarantee period shall commence the day the installation is formally handed over to and accepted by Spoornet.

Complies/Does not comply

15.3 The Contractor shall undertake to repair all faults or defects due to bad workmanship and/or faulty materials, and to replace all defective equipment or materials during the guarantee period.

Complies/Does not comply

15.4 Any defects that may become apparent during the guarantee period shall be rectified to the satisfaction of, and free of cost to Spoornet.

Complies/Does not comply

15.5 The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of his being notified by Spoornet of such defects.

Complies/Does not comply

15.6 Should the Contractor fail to comply with the requirements stipulated above, Spoornet shall be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contractor shall reimburse Spoornet the total cost of such repair or replacement, including the labour costs incurred in replacing defective material.

Complies/Does not comply

TENDERER'S SIGNATURE

DATE

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 1

PAGE 1 OF 1

SCOPE OF WORK

1.0 Site inspection required/not required.

Date :

Time :

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 2

PAGE 1 OF 1

DRAWINGS

DRAWING NO.	TITLE
CEE 55/027367	Concrete slab, cable protection
CEE-PK-14	Route marker, cable, electrical.
CEE-MA-307	Tape, cable warning, underground
FG 263	Accommodation of cables in Railway formations.

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 1 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
1.0	Route surveys (clause 7.0)		complete		
2.0	Excavations in				
a)	Hard rock		/cubic metre		
b)	Soft rock		/cubic metre		
c)	Soil		/cubic metre		
3.0	Transportation of soil		/cubic metre		
4.0	Shuttering (clause 8.10)		/m		
5.0	Concrete slabs supplied and installed (clause 12.3.2)		each		
6.0	Plastic cable warning tape supplied and installed (clause 12.3.5)		/m		
7.0	150 mm dia. half round concrete pipes supplied and installed (clause 9.2.7.)		/m		
8.0	150 mm dia. asbestos cement pipes supplied and installed		/m		
9.0	Cutting of checker plates (clause 9.4.4)		/m cut		
10.0	Backfilling of trenches with soil (clause 12.3)		/cubic metre		
11.0	Backfilling of trenches with 10:1 soil/cement mix (clause 12.2)		/cubic metre		

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 2 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
12.0	Importation of soil		/cubic metre		
13.0	Concrete cable route markers		each		
14.0	Reinstate tarred surface		/cubic metre		
15.0	Reinstate concrete surface		/cubic metre		
16.0	Installation of cables				
16.1	Installed in trenches (Clause 9.2)				
16.1.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
16.1.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
16.2	Installed in sleeve pipes (clause 9.3)				
16.2.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 3 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
16.2.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
16.3	Installed in ducts (clause 9.4)				
16.3.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
16.3.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.0	Installation of cables (Special conditions)				
17.1	Cable supports (clause 9.4.5 and 9.4.6)				
17.1.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 4 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.1.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.2	Securing cables to poles (clause 9.8)				
17.2.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
17.2.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.3	Securing cables to concrete/tunnel walls				
17.3.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 5 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.3.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
17.4	Installation of cables in track formations				
17.4.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
17.4.2	Low Voltage Cables		/m		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
18.0	Cable terminations complete (Supply material, terminate and connect up).				
18.1	XLPE cable				
18.1.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 6 OF 7

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
18.1.2	Low Voltage terminations		each		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
18.2	PILC SWA cable				
18.2.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
18.2.2	Low Voltage terminations		each		
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
	..... core mm sq				
19.0	Cable joints complete (Supply material, terminate and connect up)				
19.1	PVC to PVC		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

**SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)**

SPECIFICATION No. CEE.0023.90

APPENDIX 3

PAGE 7 OF 7

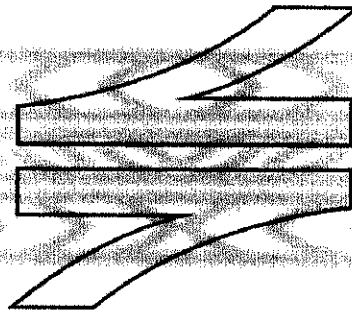
SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
19.2	XLPE to XLPE 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		
19.3	PILC to PILC 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		
19.4	XLPE to PILC 240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes		each		

TENDERER'S SIGNATURE

DATE

CHIEF ENGINEER (ELECTRICAL)
(INFRASTRUCTURE)

**SPOORNET**

A division of Transnet limited

TECHNICAL RAILWAY ENGINEERING SPECIFICATION

PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Author: Senior Technologist
Railway Engineering

H.A.Slier

Approved: Senior Engineer
Railway Engineering

L.O.Borchard

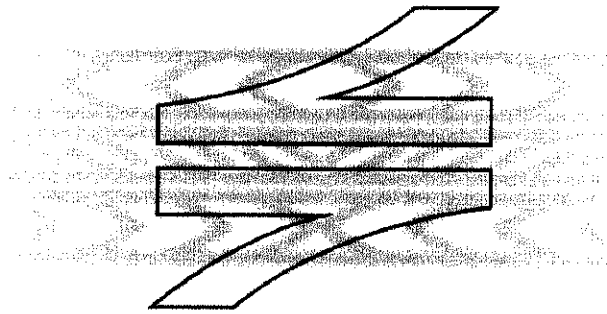
Authorised: Principal Engineer
Locomotive Environment

W.A.Coetzee

Date: 27 February 2002

Circulation restricted to:
Technical: Maintenance (Infrastructure)
Technical: Maintenance

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.



SPOORNET

A division of Transnet limited

**TECHNICAL
RAILWAY ENGINEERING
SPECIFICATION**

**PAINTING OF STEEL COMPONENTS OF
ELECTRICAL EQUIPMENT**

Circulation restricted to:

Technical: Maintenance (Infrastructure)

Technical: Maintenance

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

INDEX

SECTION	CONTENTS	PAGE
1.0	SCOPE	3
2.0	REFERENCES	3
3.0	METHOD OF TENDERING	3
4.0	SURFACE PREPARATION	3
5.0	PRODUCT APPLICATION	5
6.0	PAINT SYSTEMS	7
7.0	COATINGS AND WORKMANSHIP	7

1.0 SCOPE

This specification covers the surface preparation, paint systems and painting of steel components of electrical equipment.

2.0 REFERENCES AND GLOSSARY

The following standards and specifications are referred to herein:

2.1 South African Bureau of Standards: -

SABS 064 : Code of Practice for the Preparation of Steel Surfaces for Coating.

SABS 1091 : National Colour Standards for Paint.

2.2 Trade names :

OptiDegreaser

OptiPrime^{Aqua}

Noxyde

2.3 Classification of level of surface degradation:

RE1 – 0.05% of surface rusted

RE2 – 0.5% of surface rusted

RE3 – 1.0% of surface rusted

RE4 – 3.0% of surface rusted

RE5 – 8.0% of surface rusted

3.0 METHOD OF TENDERING

3.1 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance. Tenderers to elaborate on their response to a clause can use this document.

4.0 SURFACE PREPARATION

4.1 NON-GALVANISED STEELWORK

4.1.1 New Steelwork

SURFACE PREPARATION (Read: NOTES and SPECIAL INSTRUCTIONS)	PRODUCT REQUIREMENTS & APPLICATION (See Variations for Specific Environmental Conditions)
<ul style="list-style-type: none"> ➤ Sandblast to a standard of Sa2 to remove mill scale and/or flash rust ➤ Remove dust with <u>clean</u> compressed air (Check air for oil contamination) 	<ul style="list-style-type: none"> ➤ Apply a stripe coat to edges, bolts, crevices, nuts and rivets. ➤ Apply one thick coat of Noxyde to the entire structure with contrasting color. ➤ Apply a final thick coat of Noxyde at a consumption rate of minimum 400g/m²

4.1.2 Previously Coated Steelwork

4.1.2.1 COATING START FAILING TO A LEVEL OF RE 2

<ul style="list-style-type: none"> ➤ Test for adhesion (refer to supplier) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle 	<ul style="list-style-type: none"> ➤ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices. ➤ Apply one coat of Noxyde to entire substrate in a contrasting color
---	--

4.1.2.2 COATING FAILURE AND RUSTING TO A LEVEL OF RE 4

<ul style="list-style-type: none"> ➤ Remove all visible traces of rust by mechanical means ST2 (chip/grind/sand) OR shotblasting /spotblasting) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle. 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply one coat of Noxyde at a consumption rate of minimum 400g/m² to the entire substrate using a contrasting color.
---	---

4.1.2.3 BITUMEN COATED

<ul style="list-style-type: none"> ➤ Remove all visible rust and loosely adhering bitumen coating by means of chipping and scraping (ST2) ➤ Degrease thoroughly with OptiDegreaser ➤ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle. 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply two coats of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using contrasting colors
---	---

4.1.2.4 BADLY RUSTED STEEL WITH PITTING & CRUST FORMATION TO RE 5

<ul style="list-style-type: none"> ➤ 1.Degrease thoroughly with OptiDegreaser ➤ 2.Hydro Blast complete substrate using a spinner tip and minimum 250 bar at the nozzle ➤ Shotblast/sandblast complete substrate giving particular attention to bolts nuts rivets and crevices. Sa2 ➤ 4.Dedust 	<ul style="list-style-type: none"> ➤ Apply a first thick coat of Noxyde to the entire substrate ➤ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices using a contrasting color ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m²
---	--

4.2 GALVANISED STEELWORK

4.2.1 NEW AND WEATHERED GALVANISING WITH A SMOOTH GLOSSY FINISH

<ul style="list-style-type: none"> ➤ Degrease thoroughly with OptiDegreaser ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply one thin coat of OptiPrime^{Aqua} (100 micron wet/35 micron dry) ➤ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➤ Apply two coats of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using contrasting colors
---	---

4.2.2 WEATHERED GALVANISING

4.2.2.1 White rust (zinc oxide)

<ul style="list-style-type: none"> ➤ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply one thin coat Noxyde ➤ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using a contrasting color
---	---

4.2.2.2 Combination of red rust (iron oxide) and white rust (zinc oxide)

<ul style="list-style-type: none"> ➤ Remove all traces of red rust ➤ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➤ Rinse down with copious quantities of potable water 	<ul style="list-style-type: none"> ➤ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➤ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m² per coat to the complete substrate using a contrasting color
--	---

NOTES and SPECIAL INSTRUCTIONS:		
1 Sand or Grit-blasting a) Always use clean, non-recycled grit b) Always use fine or extra fine grit c) Always use oil free air d) Always use a moisture trap e) Dedust	2 Degreasing: a) Use only OptiDegreaser b) Dilute according to instructions – see data sheet c) Always follow up with hydro-blasting to remove all chemical residues	3 Hydro-blasting: a) Always use clean potable water b) Use a rotating nozzle and ensure a pressure of minimum 250 bar at the nozzle c) Remove ALL traces of dirt and any form of salt contamination and residues of the degreasing agent d) Concentrate in crevices and other similar "collection" areas

5. PRODUCT APPLICATION

5.1 METHOD OF APPLICATION

OptiPrime ^{Aqua}	Noxyde
Temperature-Min 5 °C Relative humidity-Max 80% R.H. <ul style="list-style-type: none"> ➤ Apply by brush, lacquer roller or airless spray using a no. 11 nozzle ➤ Apply one thin coat only - 100 micron wet = 35 micron dry (DFT) ➤ Small parts can be dipped - dilute with 10% water for dipping 	Temperature-Min. 8 °C, Max. 55 °C Relative Humidity-Max 80% R.H. <ul style="list-style-type: none"> ➤ Apply by brush, roller or airless spray ➤ For airless spray applications refer to "Tips for airless spraying of Noxyde"

5.2 DRYING TIME AND OVERCOAT PERIODS

<ul style="list-style-type: none"> ➤ Do not overcoat within 12 hours ➤ Wash down with clean potable water (100 bar) before over coating to remove dust or any other form of intermediate contamination 	<ul style="list-style-type: none"> ➤ Drying time is dependant on ambient conditions and can vary from a few minutes (in dry windy conditions) to a few hours (in humid shaded conditions) ➤ Overcoat as soon as possible to avoid contamination of previous coat ➤ Wash down with clean potable water (100 - 150 bar) before over coating if danger of contamination exists or if left more than 4 hours before over coating
--	---

5.3 CURING TIME

n/a	<ul style="list-style-type: none"> ➤ 7 - 14 days to "full cure". During this period the product is prone to mechanical damage - the longer time it is allowed to cure, the tougher it becomes
-----	--

5.4 DRY FILM THICKNESS (DFT) READINGS

35 micron	<ul style="list-style-type: none"> ➤ Severe coastal & marine environments (in the spray zone) – TWO stripe coats & overall minimum DFT of 400 micron ➤ Normal coastal environment (1 5 km from the coast line) - a single stripe coat & overall minimum DFT of 400 micron ➤ Non coastal high rainfall areas, in the immediate vicinities of rivers, dams, lakes, etc., and in industrial areas with high levels of chemical pollution - a single stripe coat & overall minimum DFT of 400 micron ➤ Dry non aggressive environments - a single stripe coat & overall minimum DFT of 250 micron <p>NOTE: DFT readings can only be taken after 72 hours</p>
-----------	--

5.5 Notwithstanding the above requirements, all surfaces shall be cleaned according to the appropriate method described in SABS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.

5.6 Blast cleaning of components shall be in accordance with clause 4.3 of SABS 064 to a degree of cleanliness of at least Sa 2 for inland exposure components and Sa 2 ½ for coastal exposure components. See Table 1 of SABS 064 for the appropriate profile.

5.7 Sheet metal that cannot be blast cleaned shall be cleaned by pickling according to clause 4.6 of SABS 064.

5.8 Components that will be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SABS 064 to a medium weight classification of table 2 of that specification.

5.9 Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SABS 064.

6.0 PAINT SYSTEM

A choice of two systems is available to suit the contractors equipment.

6.1 Noxyde paint system

1st coat: OptiPrime^{Aqua}

Wet film thickness: 100 micrometers. Dry film thickness: 35 micrometers.

2nd coat: Noxyde Topcoat

Dry film thickness: 165 micrometers @ 400g/m².

6.1.1 Paint application:

6.1.1.1 The primer and paint is normally applied by brush at supply viscosity (no reducer required).

6.1.1.2 The practical spreading rate of the primer and paint is a function of the ambient temperature, wind velocity and the application technique, but will generally fall in the range of 400g/m² in low to mild corrosive areas, and 500g/m² in severely corrosive areas.

6.1.1.3 Once the applied coat of primer/paint is touch dry, the next coat of paint may be applied.

6.1.1.4 If painted steelwork is to be bolted onto structures, it is imperative that the paint has been allowed to hard dry before the steelwork is bolted onto structures. This is to prevent the soft paint being damaged when tightening the bolts securing the steelwork to the structures.

6.2 Powder Coating System.

The powder-coating process shall be in accordance with SABS 1274 type 4: Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coatings.

7.0 COATINGS AND WORKMANSHIP

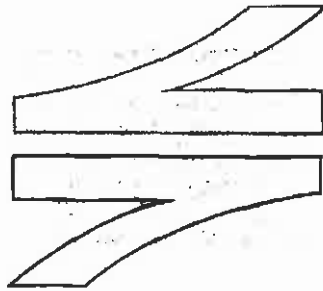
7.1 All specified coatings shall be applied according to the relevant specification and the manufacturer's instructions shall be followed.

7.2 Coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.

7.3 When examined visually, the finished products shall have a uniform appearance and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

TENDERER'S SIGNATURE.....

DATE.....



SPOORNET

A division of Transnet limited

**TECHNICAL
CONFIGURATION MANAGEMENT
SPECIFICATION CONTROL PAGE**

**DRAWINGS, CATALOGUES, INSTRUCTION MANUALS
AND SPARES LISTS FOR ELECTRICAL EQUIPMENT
SUPPLIED UNDER CONTRACT**

Statement of authorisation:

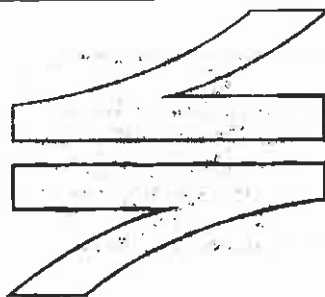
There is no SABS specification available for similar material / equipment and as far as can be ascertained no other specification / standard suitably covers Spoornet requirements. The specification has been compiled in a manner which shall favour / encourage local manufacture of material / equipment to a maximum degree.

Author:	Chief Engineering Technician Documentation management	J C van Tonder
Approved:	Senior Engineer Railway Engineering	L O Borchard
Authorised:	Senior Technologist Configuration Management	J H Hancock

[Signatures]

Date: January 2002

This page is for control purposes only and shall not be issued with the specification.



SPOORNET

A division of Transnet limited

**TECHNICAL
CONFIGURATION MANAGEMENT**

SPECIFICATION

**DRAWINGS, CATALOGUES, INSTRUCTION MANUALS
AND SPARES LISTS FOR ELECTRICAL EQUIPMENT
SUPPLIED UNDER CONTRACT**

Circulation restricted to:

Technical

© This document as a whole is protected by copyright. The information herein is the sole property of Transnet Ltd. It may not be used, disclosed or reproduced in part or in whole in any manner whatsoever, except with the written permission of and in a manner permitted by the proprietors.

INDEX

SECTION	CONTENTS	PAGE NO
1.0	SCOPE	3
2.0	DEFINITIONS	3
3.0	STANDARDS AND SPECIFICATIONS	3
4.0	APPENDIX	3
5.0	METHOD OF TENDERING	3
6.0	LANGUAGE AND UNITS OF MEASURE	4
7.0	DRAWINGS	4
8.0	INFORMATION REQUIRED ON DRAWINGS	5
9.0	CERTIFICATION OF DRAWINGS	8
10.0	CHANGES TO DRAWINGS	8
11.0	SUBMISSION OF TENDER DRAWINGS	8
12.0	DRAWINGS TO BE SUPPLIED BY SUCCESSFUL TENDERER	8
13.0	CATALOGUES	9
14.0	INSTRUCTION MANUALS	10
15.0	COMBINED DOCUMENT	11
16.0	SPARES LISTS	11
17.0	PACKING OF DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS	11
18.0	SUBSTITUTION	11

1.0 SCOPE

This specification covers Spoornet's requirements for drawings, catalogues, and instruction manuals and spares lists of electrical equipment supplied under contract.

2.0 DEFINITIONS

- 2.1 "Design drawings for approval" defines those drawings, which have to be submitted to Spoornet for approval prior to manufacture of equipment.
- 2.2 "Installation drawings" defines those drawings, which are required for the installation of the equipment.
- 2.3 "As Built drawings" defines those drawings, which reflect all the various approved designs, layouts, etc., of the actual final accepted state of the equipment.

3.0 STANDARDS AND SPECIFICATIONS

- 3.1 The following standards and specifications are referred to:

CEE.0012: Method of Tendering

SABS 0111: Engineering Drawings.

BS 308: Engineering Drawing Practice.

NRS 002: Graphical Symbols for Electrical Diagrams.

IEC 617: Graphical Symbols for Diagrams.

ASHRAE: American Society of Heating Refrigeration Air-conditioning Engineers Standard.

- 3.1.1 The following Spoornet standard (Electrical) symbol drawings are listed for reference:

CEE-PA-19: Symbols for Electrical Installations.

CEE-PA-42: Symbols for Distribution and Transmission Layout.

CEE-PA-101: Symbols for Air-conditioning installations.

CEE-TA-62: Standard Electrification Symbols.

- 3.2 Tenderers and contractors shall ensure that they work to the latest issues and amendments of the above standards and specifications.

4.0 APPENDIX

The following appendix forms an integral part of this specification:

Appendix 1: SCHEDULE OF REQUIREMENTS

This appendix calls for specific requirements applicable to the contract.

5.0 METHOD OF TENDERING

- 5.1 Tendering shall be in accordance with Spoornet (Electrical) specification CEE.0012.

- 5.2 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance.
- 5.3 The Schedule of Requirements, Quantities and Prices, Appendix 1 to this specification shall be fully completed by Tenderers. Failure to submit a fully completed sheet may preclude a tender from further consideration.
- 6.0 LANGUAGE AND UNITS OF MEASURE**
- Drawings and documents shall be prepared in English and the ISO unit of measure. Other offers will be considered on merit.
- 7.0 DRAWINGS**
- 7.1 Drawings shall be generated in either Microstation or any CAD format, which can be read by Microstation, but offers on other media will be considered on merit.
- 7.2 Drawings shall be prepared in such a manner that they fully comply with the requirements of SABS 0111 and/or BS 308.
- 7.3 Symbols, with their explanations used on the drawings but not covered by the NRS 002, IEC 617, ASHRAE or Spoornet's symbol drawings shall be furnished i.e. then included on the drawing or supplied on a separate symbol list which is to be cross referenced to the drawing.
- 7.4 Where the publications referred to in clause 3.1 are at variance, the practice detailed in SABS 0111 shall take preference.
- 7.5 Drawings shall be prepared for ISO; "A" series size sheets and shall not be greater than A1 size except as detailed below.
- 7.5.1 Where under exceptional circumstances the nature of the work is such that a size A1 is impractical, then the A0 size may be used.
- 7.5.2 Long drawings, where necessary for wiring/circuit diagrams, cable run diagrams, track layouts, etc., shall be prepared with widths equal to the widths of the "A" series sheets as required, but preferably not exceeding the length of an A0 sheet.
- 7.6 All interrelated drawings shall be clearly and adequately cross-referenced.
- 7.7 The Contractor hereby grants to Transnet a non-exclusive licence, in accordance with the provisions of section 22 of the Copyright Act, 1978;
- 7.7.1 to copy any plan, diagram, drawing, specification, bill of quantities, design calculation or other similar document made by the Contractor, other than under the direction or control of Transnet, in connection with the extent of work;
- 7.7.2 to make free and unrestricted use thereof for its own purposes;
- 7.7.3 to provide copies thereof to consultants to Transnet to be used by them for the purpose of such consultations and consulting services and-
- 7.7.4 to provide other parties with copies thereof for the purpose of tenders invited by Transnet.

- 7.7.5 Such non-exclusive licence shall apply *mutatis mutandis* to any plan, diagram, drawing, specification, bill and/or schedule of quantities, design calculation or other similar document made, other than under the direction or control of Transnet, by any principal or sub-contractor of the Contractor. The provisions of this clause shall not apply to documents made, in the case of plant or equipment to be supplied, for the manufacturing process of such equipment, but only to the equipment supplied itself.
- 7.7.6 Transnet shall make no separate or extra payment in respect of any non-exclusive licence granted in terms hereof.
- 8.0 INFORMATION REQUIRED ON DRAWINGS**
- 8.1 A title block shall be provided in the lower right hand corner of each drawing, indicating:
- 8.1.1 Descriptive title.
- 8.1.2 Contractor's drawing number.
- 8.1.3 Space for Spoornet's drawing number (as requested in clause 7.7).
- 8.1.4 Place of installation.
- 8.1.5 Contract / Order number.
- 8.1.6 Contractor's name.
- 8.1.7 Signature or name of approving officer (as requested in clause 8.0).
- 8.1.8 Approval date.
- 8.1.9 Issue number.
- 8.1.10 Projection symbol for multi-view drawings, if required.
- 8.2 Successful Tenderers can obtain a copy of Spoornet's standard title block (Microstation or DXF formats) free of charge by contacting the Documentation Management section.
- 8.3 On wiring and circuit diagrams, the following shall be specified:
- 8.3.1 Cable and wire sizes.
- 8.3.2 Values of resistance.
- 8.3.3 Breaking capacity of switches.
- 8.3.4 Ratings of equipment.
- 8.4 On each assembly or sub-assembly drawing, the following shall be given:
- 8.4.1 Description of item.
- 8.4.2 Quantity required for assembly depicted.
- 8.4.3 Material manufactured from.
- 8.4.4 The classification of the material according to the relevant SABS specification or other specifications referred to herein.

-
- 8.4.5 The class or process of finish and/or coating.
 - 8.4.6 Where special parts are specified, the name of the manufacturer, the size, capacity and the name or catalogue number of each part shall be furnished.
 - 8.4.7 The mass of finished item depicted on the drawing.
 - 8.4.8 Dimensions from a proper reference surface.
 - 8.4.9 Dimension tolerances.
 - 8.5 *On electrification drawings, the following shall be specified:*
 - 8.5.1 Kilometre distances.
 - 8.5.1.1 Kilometre distances of all new and existing masts measured from the preceding kilometre post.
 - 8.5.2 Civil
 - 8.5.2.1 The following civil information shall be shown:
 - 8.5.2.1.1 Bridges.
 - 8.5.2.1.2 Tunnels.
 - 8.5.2.1.3 Pipes.
 - 8.5.2.1.4 Culverts.
 - 8.5.2.1.5 Subways.
 - 8.5.2.1.6 Manholes.
 - 8.5.2.1.7 Off track platforms.
 - 8.5.2.1.8 Water-furrows along track.
 - 8.5.2.1.9 Service roads that may influence electrification.
 - 8.5.2.1.10 Level crossings.
 - 8.5.2.1.11 All banks and cuttings.
 - 8.5.2.1.12 Retaining walls.
 - 8.5.2.1.13 Gradient markers and gradients.
 - 8.5.2.1.14 Boundary fences (where relevant).
 - 8.5.2.1.15 The beginning and ending of transition and circular curves and the radius.
 - 8.5.2.3 On all station plans the beginning and ending of the platforms to be indicated, as well as all buildings and structures on the platform which may effect electrification. All secondary platforms/structures/obstacles, which may effect electrification, must also be shown.
 - 8.5.2.4 All points with stock rail joints, intersection of centre lines and all ends of point positions to be shown, as well as the type of point, e.g. 1:9 LH (left hand).
-

-
- 8.5.3 Electrical
- 8.5.3.1 The following electrical information shall be shown:
- 8.5.3.1.1 New and existing masts and structures with appropriate sizes.
- 8.5.3.1.2 Span lengths.
- 8.5.3.1.3 Tension lengths.
- 8.5.3.1.4 Mast to track centres.
- 8.5.3.1.5 Tension type (spring or weight).
- 8.5.3.1.6 Transmission lines, Transnet and Eskom (Showing crossing heights above rail level).
- 8.5.3.1.7 Telkom lines.
- 8.5.3.1.8 Height gauges.
- 8.5.3.1.9 Power and Lighting kiosks.
- 8.5.3.1.10 Electrical cables nearer than 3,2m from track centre, as well as cables crossing the track.
- 8.5.3.2 Wire profiles showing clearances/wire heights for all transmission and telecommunication lines that cross the tracks shall be shown on the drawing at the point of crossing, in either tabular or graphic format.
- 8.5.3.3 *Wire profile for all bridges and tunnels shall be shown on separate drawings.*
- 8.5.3.4 Important information that shall be noted are:
- 8.5.3.4.1 Basic span.
- 8.5.3.4.2 Ruling contact wire height.
- 8.5.3.4.3 Reference to bonding drawings.
- 8.5.3.4.4 Wire sizes.
- 8.5.3.4.5 Types of structures and foundations.
- 8.5.3.4.6 Tables for traction and transmission line (Showing wire heights).
- 8.5.3.4.7 Dropper chart.
- 8.5.3.4.8 Overlaps.
- 8.5.3.4.9 Jumpers.
- 8.5.3.4.10 Staggering.
- 8.5.3.4.11 References to switching diagram drawings.
- 8.5.3.4.12 Any other relevant Information.
- 8.5.4 Signal.
- 8.5.4.1 The following signal information shall be shown:
-

-
- 8.5.4.1.1 Signal gantries (showing direction of aim).
 - 8.5.4.1.2 Independent signals (showing direction of aim).
 - 8.5.4.1.3 Signal kiosks.
 - 8.5.4.1.4 Telephones.
 - 8.5.4.1.5 Signal relay rooms.
 - 8.5.4.1.6 Radio repeater rooms.
 - 8.5.4.1.7 Signal cables nearer than 3,2m from track centre, as well as cables crossing the track.
 - 8.5.5 Electrification information must be clearly indicated on drawings (see also drg no CEE-TA-62 for Standard Electrification Symbols).
 - 8.7 The successful tenderer shall obtain Spoornet's drawing numbers from the Documentation Management section of Spoornet well in advance in writing, wherein details of all relevant drawings, i.e. titles and makers numbers are quoted. Against this information Spoornet will allocate its own numbers for inclusion by the Contractor on the original drawings.
 - 9.0 CERTIFICATION OF DRAWINGS**
The contractor against a date to certify that the drawing has been checked and is correct in all respects shall approve each drawing. This also includes changes.
 - 10.0 CHANGES TO DRAWINGS**
Any drawing returned to the Contractor for changes shall be re-submitted to Spoornet within 21 days with the appropriate changes endorsed thereon.
 - 11.0 SUBMISSION OF TENDER DRAWINGS**
The Tenderer shall submit drawings of all major items of equipment with the tender. The drawings shall be sufficiently detailed (e.g. safety factors) to enable suitability of the design to be judged and to enable Spoornet to prepare a reasonably accurate estimate of the cost of maintenance.
 - 12.0 DRAWINGS TO BE SUPPLIED BY SUCCESSFUL TENDERER**
 - 12.1 Two prints of each design drawing for approval to be submitted prior to commencement of work or manufacture of any equipment to Spoornet. This includes drawings of general layouts, cable routes, schematic diagrams, foundations, equipment etc.
 - 12.2 Two prints of each installation and/or erection drawing to be submitted to Spoornet. This includes drawings of modular steel buildings, structures etc. and shall be delivered at the same time the delivery of the equipment commences.
 - 12.3 The successful tenderer shall supply one complete set of approved (signed) "As Built" working drawings as well as the electronic files thereof. Drawings shall be fully dimensioned, fully detailed, clear and neat. The set shall comprise all electrical and mechanical drawings considered necessary by Spoornet and shall include drawings of all renewable parts or items. "As Built" drawings of all enclosures, structures and foundations shall also be supplied.
-

-
- 12.4 All relevant "As Built" drawings required shall be delivered to Spoornet within 90 days of completion of the installation and delivery of equipment.
- 12.5 Until all relevant drawings called for in the contract are delivered, the contract will be considered incomplete.
- 13.0 CATALOGUES**
- 13.1 Tenderers shall submit a separate quotation for the supply of the itemised part catalogues when specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).
- 13.2 The information contained in the catalogues shall be classified into convenient sectors and be indexed. Thumb tabs shall be provided for quick reference to sections. All apparatus shall be illustrated by means of photographs or detailed sketches on which both the parts and the catalogue numbers of the parts are clearly shown. Catalogues shall have exploded views of components for clarity where needed.
- 13.3 The following information shall be given in tabular form:
- 13.3.1 Designation of apparatus or item of equipment.
- 13.3.2 Description of part including information such as dimensions, sizes, resistance values, stranding, material, current ratings, etc.
- 13.3.3 Catalogue number.
- 13.3.4 Manufacturer's name.
- 13.3.5 "As Built" drawing and item number where applicable.
- 13.3.6 Quantity of parts required for each piece of apparatus.
- 13.3.7 Illustrating photographs or sketch number.
- 13.3.8 Nato registration where applicable.
- 13.4 In a suitable section of the catalogue the following information shall be given:
- 13.4.1 Index to "As Built" Drawings.
- 13.4.1.1 "As Built" drawing number.
- 13.4.1.2 Heading.
- 13.4.1.3 Parts shown on drawing.
- 13.4.2 Index to catalogue numbers.
- 13.4.2.1 Catalogue numbers in numerical order.
- 13.4.2.2 Catalogue volume number, where applicable.
- 13.4.2.3 Section in which part is listed.
- 13.4.2.4 Page number.
-

-
- 13.4.3 Special tools.
- 13.4.3.1 Designation and description of special tools.
- 13.4.3.2 Catalogue number.
- 13.5 Each volume shall be neatly bound in hard serviceable cover on which the contract numbers volume number and titles are printed. All the information in the catalogues shall be given in a clear legible manner. The catalogues shall include all items of equipment to be supplied by the successful tenderer.
- 13.6 Catalogues shall be delivered before date of completion of the contract.
- 14.0 INSTRUCTION MANUALS**
- 14.1 Tenderers shall submit a separate quotation for the supply of the number of copies of instruction manuals specified in the Schedule of Requirements. The size shall be A4 (297 mm x 210 mm). Consideration shall be given on merit of the supply of these catalogues electronically (PDF format).
- 14.2 The successful tenderer shall submit draft instruction manuals for approval prior to final printing/compiling and delivery.
- 14.3 The approved instruction manuals shall be delivered before commissioning the equipment. If this cannot be met, the successful tenderer shall furnish at least three copies of preliminary instruction manuals, suitable for the use of maintenance staff, until the final instruction manuals are to hand (which shall be before the date of completion of the contract).
- 14.4 The construction, method of operation and purpose of all items of equipment shall be fully explained by means of descriptions and photographs, sketches, drawings or circuit diagrams showing all details.
- 14.5 The information contained in the instruction manuals shall be classified into convenient sections and indexed. Where multiple models are produced each model shall be described in a separate section in such a manner that models not applicable can be omitted. Where possible the sections shall be subdivided as follows:
- 14.5.1 Installation and commissioning.
- 14.5.2 General description and method of operation.
- 14.5.3 Maintenance and inspection.
- 14.5.4 Overhaul and repair of equipment.
- 14.5.5 Technical and maintenance data.
- 14.5.6 Test procedure flow charts.
- 14.5.7 Fault finding and trouble shooting.
- 14.6 The method of calibrating, setting or adjusting all equipment requiring such attention shall be described and where necessary illustrated. The necessary data shall be given in each case to enable the equipment to be checked by measurement if required.
-

14.7 Full step-by-step instructions regarding the servicing and repair of the equipment shall be given together with all the necessary data such as dismantling and assembling procedures, working clearances, tolerances, limits, fits, maximum permissible wear, recommended lubricants, use of special tools, insulation and winding data, spring pressures and tensions, brush data, fuse data, etc. Recommended servicing/rework/replacement of parts frequencies shall also be included in the maintenance and inspection section of the instruction manual.

14.8 Any delay in delivery of the complete supply of satisfactory instruction manuals/preliminary manuals as provided for in this clause, will subject the Contractors to a deduction from the contract sum, of a penalty as defined in the tender, counting from the specified delivery time until such time as the said manuals are delivered.

15.0 COMBINED DOCUMENTS

If desired the catalogues and instruction manuals specified in clauses 12.0 and 13.0 may be combined into single volumes. Tenderers shall state whether or not it is their intention to do so. In this case the delivery shall be as specified in clause 13.3, alternatively the conditions described in clause 13.8 applies.

16.0 SPARES LIST

16.1 To enable Spoornet to catalogue and timeously acquire all spares required, the following information shall be submitted before commissioning of equipment:

16.1.1 An itemised schedule of the spares (with reference to alternatives) which are recommended for normal maintenance purposes.

16.1.2 The quantity recommended to be held against each item on the spares list and where sets are supplied, the types and quantity per type to make up a set.

16.1.3 A full and complete ordering description and number of each individual spare with drawing number if relevant.

16.1.4 Where the ordering description and number differs from that of the original manufacturer's catalogue, description and number, the original manufacturer's name, description, type and ordering number shall be listed as well as all other relevant data available.

16.1.5 The national stock number - Nato - number of each spare where the particular spare was imported from a Nato country and where a national stock number was allocated.

16.2 Initially the spares list containing the above information will suffice, but this list shall not in any way replace or supersede the spare parts catalogue mentioned in clause 12.0.

17.0 PACKING OF DRAWINGS, CATALOGUES, INSTRUCTION MANUALS AND SPARES LISTS

All items shall be packed in such a way that they are received in good condition.

18.0 SUBSTITUTION

This specification replaces specification CEE.0224.94

TENDERER'S SIGNATURE: _____

DATE: _____

FOR SPOORNET: _____

GRADE: _____

END

"Preview Copy Only"

Appendix 1

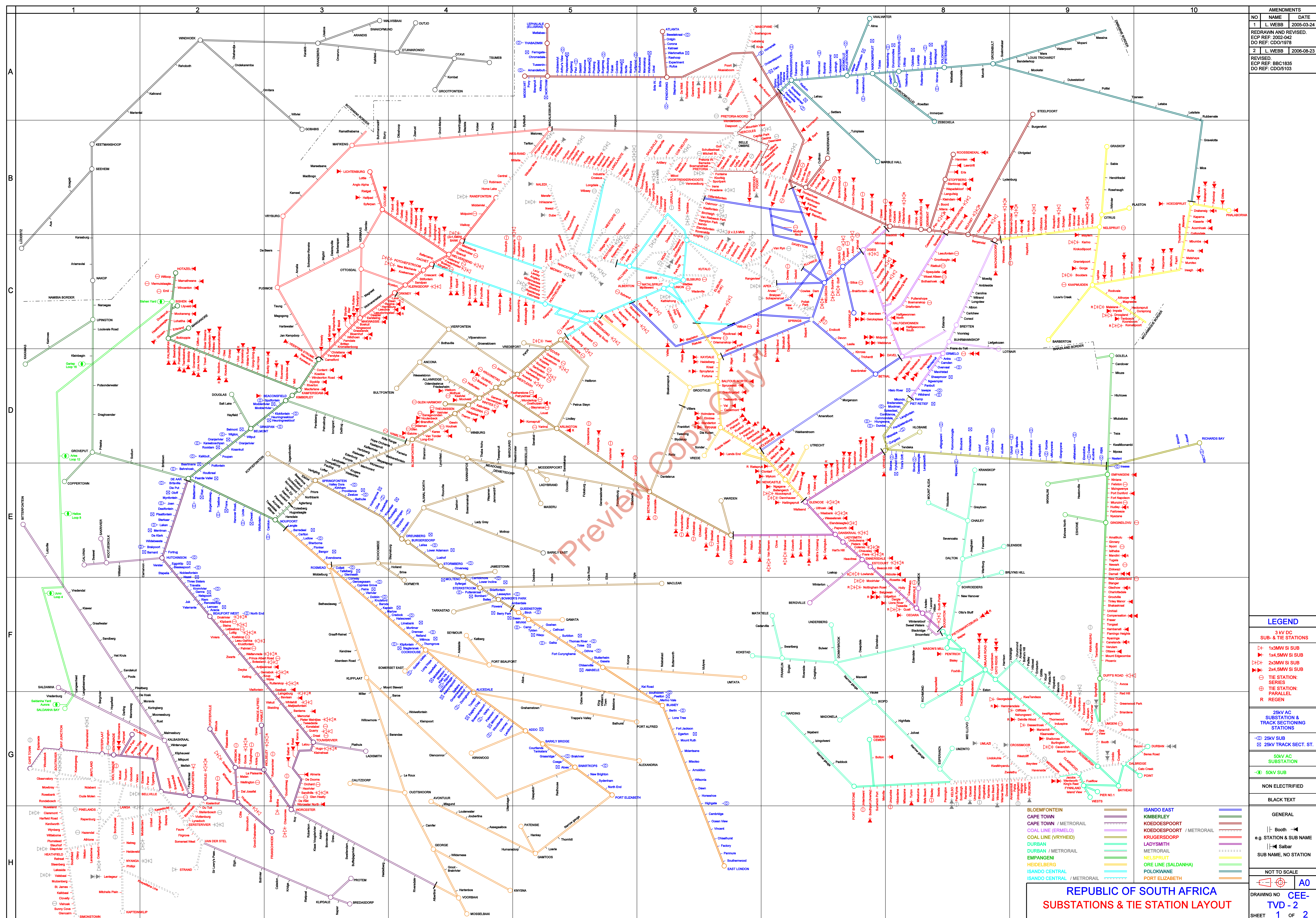
SCHEDULE OF REQUIREMENTS

- 1.1 Sets of maintenance and instruction manuals, wiring diagrams, quality assurance test and quality control sheets complete with 'as built drawings' of the equipment installed shall be provided by the Contractor. Results of measurements
- 1.1.1 For the substation:-
- One set of documentation consisting of specific information for that substation.
- 1.1.2 For the depot:-
- Two sets of documentation consisting of generic information per equipment type.
 - Two sets of documentation consisting of specific information per substation in the depot area.
- 1.1.3 For head office:-
- One set of documentation consisting of generic information per equipment type.
 - One set of documentation consisting of specific information per substation in this contract.
- 1.2 One copy of the documentation containing generic and specific information must be available at the commissioning and handing over of equipment.

FOR SPOORNET: _____

GRADE: _____

.....END.....



Empangeni Depot

A - TOTALS	
Amatikulu Total	
Port Dunford Total	
Hudley Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

Empangeni Depot

A - TOTALS	
Amatikulu Total	
Empangeni Total	
Port Durnford Total	
Hudley Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES			
No.	Item	Unit	
			Labour
			Material and Equipment
1	Removal of existing foundations.	Per Breaker	
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker	
3	Dechlorination.	Per Breaker	
TOTAL			

BILL OF QUANTITIES - AMATIKULU

[illegible]

ⁿ Contractor to determine

Contract
Part C2: Pricing Data

TRANSNET



BILL OF QUANTITIES - PORT DUNFORD

[illegible]

* Contractor to determine

BILL OF QUANTITIES - HUDLEY

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	HUDLEY SUBSTATION (88kV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismantle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	1					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and install Polycarbonate Box.	each	1					
C	Other(Specify):							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Hudley	Total	

* Contractor to determine

* Contractor to determine

ERMELO DEPOT

A - TOTALS	
Broodsniersplaas Total	
Ermelo Total	
Nooitgedaght Total	
Rietvleirus Total	
Hamelfontein Total	
Davel Total	
Webbsrus Total	
Midpoint Total	
HWN South Total	
HWN North Total	
Grootlaagte Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

BILL OF QUANTITIES - BROODSNYERSPLAAS[illegible]

* Contractor to determine

BILL OF QUANTITIES - ERMELO

Item No.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	ERMELO SUBSTATION 88kV (DOUBLE UNIT)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 0000)	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	2					
4.0	Dismantle/remove old Steel structure.	Complete	2					
5.0	Transport old uncontaminated equipment to depot.	/Site	2					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	2					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	2					
5.0	Supply and install Polycarbonate Box.	each	2					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Ermelo	Total	

* Contractor to determine

BILL OF QUANTITIES - NOOITGEDACHT[illegible]

* Contractor to determine

BILL OF QUANTITIES - RIETVLEISRUS

Item No.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	RIETVLEISRUS SUBSTATION (88kV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2009).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismantle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and install Polycarbonate Box.	each	1					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						RietvleiSRus	Total	

* Contractor to determine

[illegible]

* Contractor to determine

BILL OF QUANTITIES - DAVEL

[illegible]

* Contractor to determine

BILL OF QUANTITIES - WEBBSRUS

Item No.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	WEBBSRUS SUBSTATION 88kV (DOUBLE UNIT)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002)	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	2					
4.0	Dismantle/remove old Steel structure.	Complete	2					
5.0	Transport old uncontaminated equipment to depot.	/Site	2					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	2					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	2					
5.0	Supply and install Polycarbonate Box.	each	2					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Webbsrus	Total	

* Contractor to determine

BILL OF QUANTITIES - MIDPOINT

[illegible]

* Contractor to determine

BILL OF QUANTITIES - HWN SOUTH

[illegible]

* Contractor to determine

BILL OF QUANTITIES - GROOTLAAGTE

[illegible]

* Contractor to determine

Occupational Health and Safety Plan

Company name: _____

Project name: _____

NB Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details

2. Policy Statement

3. Objectives

4. Common Vocabulary

5. Legislation

6. Statutory Obligations

7. Project Management

- 7.1. Notification of Construction Work
- 7.2. Health and Safety Specification – Client to provide
- 7.3. Health and Safety Plan
- 7.4. Health and Safety File
- 7.5. Agreement with Mandatory
- 7.6. Appointment of Contractor
- 7.7. Site Organisation
 - 7.7.1. Assignment of Duties
 - 7.7.2. Construction Work Supervisor
 - 7.7.3. Subordinate Construction Work Supervisor
 - 7.7.4. Construction Safety Officer
 - 7.7.5. List of Contractors already appointed - List to be revised at least monthly
 - 7.7.6. Health and Safety Representative
 - 7.7.8. Scaffold Inspector
 - 7.7.9. Portable Fire Equipment Inspector

8. Incident Management

- 8.1. Performance Statistics
 - 8.1. Incident and or injuries
 - 8.1.1. Identity Document – certified by a Commissioner of Oaths
 - 8.1.2. Reporting
 - 8.1.3. Recording
 - 8.1.4. Investigation
 - 8.1.5. Statistics
 - 8.1.6. Medical certificate of fitness
 - 8.1.7. Noise induced hearing loss
- 8.2. Health and Safety Committee
 - 8.2.1. Composition
 - 8.2.2. Meetings

8.3. Legal Compliance Audits

8.3.1. Audits

8.3.2. Analysis

9. Logbooks and Registers

9.1. Electric Equipment / Tools Register - Portable

9.2. Fall Protection Plan

9.3. Fire fighting appliance Register - Portable

9.4. Personal Protective Equipment and Clothing

9.5. Scaffold Register

10. Risk Management

10.1. Task descriptions

10.2. Risk Identification

10.3. Risk Assessment

11. Education and Training

11.1. Induction training

11.2. Site Specific Training

11.3. Certificate of Competence

12. Emergency Planning – Evacuation plan

12.1. Client procedure

12.2. Site Procedure

13. Environment

13.1. Environment control plan

13.2. Environment monitoring

14. Health and Safety Communications

15. Safe working procedures

16. Personal Protective Equipment and Clothing

17. Project security

18. Implementation Costs

Costing must include but is not limited to the following -

18.1. Administration

18.2. Utilisation of SMMe, Emerging Contractors and the Local Community

18.3. Education, training and certification

18.4. Legal compliance audits

18.5. Personal Protective Equipment and Clothing

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1.

PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.2. **Agent:**

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Facsimile –

Cellular:

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Assignee Sect 16(2)

Contact No:

Telephone –

Facsimile

Cellular:

Email

1.4.2. Construction Work Supervisor:

Name:

Construction Regulation 6. (1)

Contact No:

Telephone

Facsimile

Cellular telephone No:

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle contractor and the other Contractors.

1.6. Duration of contract:

Start –

Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			

Project Manager:

Safety Advisors:

Telephone

Facsimile

Email

DEPARTMENT OF LABOUR

Provincial Office

Department of Labour:

Contact No:

OCCUPATIONAL HEALTH AND SAFETY

Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3.

Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all contractors and their employees working on this project.

4.

Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

- BCEA
- COIDA
- DoL
- DoL (IES)
- FEMA
- NBR&S
- OH&SA
- CR
- PD

5.

Legislation

Definition

“client” the person for whom any construction work is performed,

“agent” means any person, appointed in writing to represents the Client,

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,

“contractor” an employer who performs construction work,

Legislation

CR 4. (1)

CR 4 (5)

CR

CR

CR

CR

“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR
“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993),	CR
“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work,	CR
“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping,	CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(c) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6.

Statutory Obligations

Description

Legislation
BCE

6.1. Basic Conditions of Employment Act

The relevant sections are to be complied with special attention to at least the following –

Working hours,

Conditions of employment and Remuneration,

Termination of employment,

Employment of child labour prohibited.

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)

COIDA

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee's duties.

All employers-Principle contractor and Contractors must register with a compensation insurer – either COIDA or FEMA.

They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insured prior to commencing work on the project with a copy on Site.

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993)

OH&SA

The OH&SA is the primary law regulating occupational health and safety matters.

The Act is a framework Act that provides for the development of detailed rules and standards through regulation.

As a framework, the Act prescribes that -

(a). the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,

(b). the duties of employers to their employees, employees to their employer and suppliers to the employer and ©. the “reasonable man” approach by the employer in decisions concerning occupational health and safety, (f). the management, application and

enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle contractor and contractor.

(g). each principle contractor and contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from contractor to Principle contractor to the client.

Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description	By whom	Legislation
7.1. Notification of Construction Work.	Principle Contractor!	CR 3.1
7.2. Health and Safety Specification The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.	Client to provide.	CR 4. (1)(a)
7.3. Health and Safety Plan This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.	Contractor	CR 5. (1)
7.4. Health and Safety File All documentation – minutes of health and safety committee meetings, risk Identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.	Contractor	CR 5. (7)
7.5. Agreement with Mandatory A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.	Client / Agent / Principle and Contractor	Act Sec 37(2)
7.6. Appointment of each Contractor by the Agent.		C R 5 (3) (b)
7.7. Organisation chart		
7.7.1. Assignment of Duties Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.	Contracts Manager	Act Sec 16(2)
7.7.2. Construction Supervisor Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.	Site Agent	CR 6. (1)
7.7.3. Sub-ordinate Construction Supervisor. Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1. NB Under no circumstances may a contractor leave employees on the site unless there is a competent construction work supervisor present.		CR 6. (2)
7.7.4. Construction Safety Officer Mr _____ has been appointed a part – time construction safety officer for the duration of the project.	Part-time/Full-time	CR 6. (6)

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box 1254 –

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile
Email:

Every contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB A section 37(2) Agreement with Mandatory must be entered into between the contractors and the principle contractor.

NB Contractor who contracts out construction work

Where a contractor contracts construction work out to another contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s

Act sect 18

Mr _____ is a designated health and safety representative.
He will perform his prescribed duties in his area of responsibility.

Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator.

C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector: _____

C R 14(2)

Mr _____ is appointed for this project.
Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8.

Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project.

Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury.

Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented.

The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES

Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

C O I D Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4. Investigation.

Sect 31

The severity of the injury will dictate whom and when the investigation must be conducted.

Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence.

A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a contractor is injured the contractor and the health and safety representative for the area in which it occurred will be part of the team.

The client or his agent may if they wish form part of the team.

A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted.

The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle contractor and contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle contractor's and all contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle contractor and every contractor. The following information must be recorded and kept on the health and safety file of the principle contractor / s and the contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted.

Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

- i) working in an elevated position,
- i. suspended platform,
- ii. Cranes – mobile - tower
- iii. Construction vehicles.

R 8. (2)(b)
CR 15(12) (a)
CR 20(g)
CR21 (1) (d)(ii)
CR 7. (1)

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary.

The prescribed conditions will apply as though it was legislated.

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. Composition.

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee.

The Health and safety representatives will be required to attend the health and safety committee meetings.

The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes.

The Client, Principle Agent must receive a copy of the minutes.

The audit of the contractors must be consolidated, analysed and submitted to the principle contractor and the client.

The findings will be documented, analyses and recommendations made.

Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required.

The action agreed on i.e. the responsible man test - and the time scheduling must be implemented.

As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. First aid Equipment

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project.

The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his findings in the appropriate register.

CR 27 (g)

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible.

As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained.

Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent.

Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified.

Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working,

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____	3 Short sharp blasts
--------------------	-----------------------------

Serious Incident : _____	Long – short – long blasts
All clear : _____	5 seconds

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based.

The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is “the study of work”. Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together.

Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

16 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board.

Where appropriate Newspaper clipping may be used during “tool box” talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

17. Safe work procedures.

A programme of safe work procedures is the be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed.

The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.

All procedures need to be documented.

18. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee.

The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle contractor and contractor must take all reasonable steps to ensure that PPE issued is used, worn and maintained as described. GSR 2(6)

19. Project / Site Security.

19.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site.

Suitable information signs must be strategically positioned.

They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

19.2. Access control

The Client is responsible for the access to and egress from the construction area.

20. Implementation costs.

The cost of implementation should include but are not limited to the following-

20.1. Administration

Project registration,

Occupational health and safety plan and file,

All assignments, appointments and designation,

Risk identifications and assessments and Logbooks and registers,

Health and safety committee meetings and minutes.

20.2. Training and Education

Induction training and badges,

First aid,

Health and safety representatives

Others - specify,

20.3. Legal compliance audits and reports.

Monthly or as required by the client.

20.4. Personal Protective Equipment and Clothing.

20.5. Other.

Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted. This approved plan will be made available to each Contractor prior to their commencing construction work on the project.

We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

_____	_____	_____	_____
Name	Signature	Designation	Date

Principle Contractor

_____	_____	_____	_____
Name	Signature	Designation	Date

Principle Contractor

_____	_____	_____	_____
Name	Signature	Designation	Date

Occupational Health and Safety Plan

Company name: _____

Project name: _____

NB Includes Environmental, Occupational Health and Safety and Quality Management (SHEQ)

CONTENT

1. Project Details

2. Policy Statement

3. Objectives

4. Common Vocabulary

5. Legislation

6. Statutory Obligations

7. Project Management

- 7.1. Notification of Construction Work
- 7.2. Health and Safety Specification – Client to provide
- 7.3. Health and Safety Plan
- 7.4. Health and Safety File
- 7.5. Agreement with Mandatory
- 7.6. Appointment of Contractor
- 7.7. Site Organisation
 - 7.7.1. Assignment of Duties
 - 7.7.2. Construction Work Supervisor
 - 7.7.3. Subordinate Construction Work Supervisor
 - 7.7.4. Construction Safety Officer
 - 7.7.5. List of Contractors already appointed - List to be revised at least monthly
 - 7.7.6. Health and Safety Representative
 - 7.7.8. Scaffold Inspector
 - 7.7.9. Portable Fire Equipment Inspector

8. Incident Management

- 8.1. Performance Statistics
- 8.1. Incident and or injuries
 - 8.1.1. Identity Document – certified by a Commissioner of Oaths
 - 8.1.2. Reporting
 - 8.1.3. Recording
 - 8.1.4. Investigation
 - 8.1.5. Statistics
 - 8.1.6. Medical certificate of fitness
 - 8.1.7. Noise induced hearing loss
- 8.2. Health and Safety Committee
 - 8.2.1. Composition
 - 8.2.2. Meetings

8.3. Legal Compliance Audits

8.3.1. Audits

8.3.2. Analysis

9. Logbooks and Registers

9.1. Electric Equipment / Tools Register - Portable

9.2. Fall Protection Plan

9.3. Fire fighting appliance Register - Portable

9.4. Personal Protective Equipment and Clothing

9.5. Scaffold Register

10. Risk Management

10.1. Task descriptions

10.2. Risk Identification

10.3. Risk Assessment

11. Education and Training

11.1. Induction training

11.2. Site Specific Training

11.3. Certificate of Competence

12. Emergency Planning – Evacuation plan

12.1. Client procedure

12.2. Site Procedure

13. Environment

13.1. Environment control plan

13.2. Environment monitoring

14. Health and Safety Communications

15. Safe working procedures

16. Personal Protective Equipment and Clothing

17. Project security

18. Implementation Costs

Costing must include but is not limited to the following -

18.1. Administration

18.2. Utilisation of SMMe, Emerging Contractors and the Local Community

18.3. Education, training and certification

18.4. Legal compliance audits

18.5. Personal Protective Equipment and Clothing

Title.

Occupational Health and Safety Plan

This health and safety plan has been prepared in term of the Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations Construction Regulation 5. (1).

This Health and Safety Plan will be revised as and when additions, alterations etc are communicated to us by the Client, his Agent or the Architect / Designer or the conditions of the contract dictate.

1.

PROJECT DETAILS

1.1. Project Name:

Physical address:

Contact Details:

Client name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.2. **Agent:**

Company name:

Postal address:

Contact person - Name:

Contact No:

Telephone –

Facsimile –

Cellular No:

Email

1.3. Architect.

Company name:

Postal Address:

P O Box

Contact person:

Postal address:

P O Box

Contact No:

Telephone –

Facsimile –

Cellular:

Email:

1.4. Principle Contractor

Company name:

Postal Address:

P O Box

1.4.1. Project Manager.

Name:

Assignee Sect 16(2)

Contact No:

Telephone –

Facsimile

Cellular:

Email

1.4.2. Construction Work Supervisor:

Name:

Construction Regulation 6. (1)

Contact No:

Telephone

Facsimile

Cellular telephone No:

1.5. Scope of work

Doors

Electrical installation – re-wiring

Glazing

Granite tops

Plastering

Plumbing and drainage

Shop fittings

Softs, curtains etc

Tiling

NB Where there is construction work in progress with other personnel in the immediate vicinity activities must be co-ordinated by the Principle contractor and the other Contractors.

1.6. Duration of contract:

Start –

Expected completion –

1.7. Emergency Telephone Numbers:

An emergency telephone number list should be prominently displayed adjacent to the telephone
The contents of this list is flexible and the following is given as a guide –

EMERGENCY TELEPHONE NUMBERS

Service	Name	Business	After Hours
i Ambulance:			
ii Doctor:			
iii. Hospital:			
iv. Fire Department:			
v. S.A. Police Services:		10111	
vi. Department of Labour:			
vii. Compensation Insurer			
vii.a COID – Commissioner			
vii.b. FEMA			

Project Manager:

Safety Advisors:

Telephone

Facsimile

Email

DEPARTMENT OF LABOUR

Provincial Office

Department of Labour:

Contact No:

OCCUPATIONAL HEALTH AND SAFETY

Policy statement

The Company is committed to providing a safe and healthy working environment and this occupational health and safety plan documents the action that will be implemented.

We acknowledge that as the Principle contractor we have both a legal and moral obligation to as far as is reasonable and practicable to develop a realistic Health and Safety plan making due reference to the Clients Health and Safety Specification.

We further accept that we must ensure that the relevant legislation is complied with and that all reasonable and practicable steps are taken by all Contractors to provide a safe and healthy environment for persons to work in and that the public are adequately protected.

An independent health and safety advisor will conduct a monthly legal compliance audit to ascertain the level of adherence with statutory requirements, company policy and rules including Occupational Health and Safety, Environmental and Quality standards.

3.

Objective.

To complete the project within the budget in respect of finance and time, to an acceptable quality and with no injuries to employees or other persons.

The specific purpose is to achieve and maintain realistic and sustainable International and locally acceptable standards. A ZERO tolerance attitude towards incidents and non-compliance of prescribed quality and workmanship will be adopted. Deviations will be investigated and the appropriate corrective action must be implemented.

NB This Specification will be imposed on all contractors and their employees working on this project.

4.

Common Vocabulary (COMVOC)

Terminology

- 4.1. Basic Conditions of Employment Act 1997 (Act No 75 of 1997)
- 4.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)
- 4.3. Department of Labour
- 4.4. Department of Labour – Inspection and Enforcement Services
- 4.5. Federated Employers Mutual Assurance Company Limited
- 4.6. National Building Regulations and Standards Act 1997 (Act No 103 of 1997)
- 4.7. Occupational Health and Safety Act 1993 (Act No 85 of 1993) and Regulations
- 4.8. Occupational Health & Safety Act 1993 Construction Regulations, 2003
- 4.9. Provincial Director

Abbreviation

- BCEA
- COIDA
- DoL
- DoL (IES)
- FEMA
- NBR&S
- OH&SA
- CR
- PD

5.

Legislation

Definition

“client” the person for whom any construction work is performed,

“agent” means any person, appointed in writing to represents the Client,

“architect / Designer” a person who prepares, checks, prepares or assists with a design,

“competent person” a person with the knowledge, training, experience and qualification specific to the work or task being performed. Where there is, and he/she has the appropriate SAQA qualification,

“construction Safety Officer” a competent person in relation to occupational health and safety in the construction industry,

“contractor” an employer who performs construction work,

Legislation

CR 4. (1)

CR 4 (5)

CR

CR

CR

CR

“ergonomics” the application of scientific information to optimise human well-being and performance,	CR
“fall prevention plan” a documented plan to eliminate or reduce the risk of falling,	CR
“hazard assessment” the analysis of all existing or potential hazard associated with the work being or to be performed.	
“hazard identification” the identification of existing or known hazards that is normally associated with the work being or to be performed,	CR
“health and safety file” a permanent record of the health and safety requirements prescribed in theses regulations,	CR
“health and safety plan” a documented plan, including safe work procedures to mitigate, remove, reduce or eliminate the hazards identified,	CR
“health and safety specification” means a documented specification of the health and safety requirements for the tasks to be performed safely,	CR
“medical certificate of fitness” a certificate valid for one year issued by an occupational health practitioner registered with the Health Professional Council of South Africa,	CR
“method statement” the documented procedure to perform the task as reasonably and practicably safe,	CR
“national building regulations” means the regulations made in terms of section 17(1) of the NBR and BS Act, 1997 (Act No 103 of 1997).	
“principle contractor” an employer who performs construction work appointed in writing by the Client or his appointed Agent,	CR
“professional engineer or professional certificated engineer” means any person holding registration as either a Professional Engineer or Professional certificated Engineer under the Engineering Professions Act, 2000,	CR
“provincial director” means the Provincial Director as defined in Section 1 of the General Administration Regulations under the Act,	CR
“risk assessment” a programme to determine any risks associated with a task and the to identify the steps to remove, reduce or control such hazard,	CR
“SABS – 085” the code of practice – “Design, erection, use and inspection of Access Scaffolding”,	CR
“SABS – 0400” the code of practice for the application of National Building Regulations,	CR
“SABS EN 1808 and SABS 1903” the code of practice entitled “safety requirements on suspended access equipment design calculations, stability criteria, construction – tests”,	CR
“The Act” means the Occupational Health and Safety Act 1993 (Act No 85 of 1993),	CR
“construction Vehicle” a vehicle used for means of conveyance for transporting persons or material or both as the case may be, both on and off the construction site for the purpose of performing construction work,	CR
“excavation” means any man – made cavity, trench, pit or depression formed by cutting, digging or scooping,	CR

“fall prevention equipment” means equipment used to prevent persons from falling from an elevated position, CR

“roof apex height” means the dimensional height in meters measured from the lowest ground level abutting any part of a building to the highest point of the roof, CR

“scaffold” means any temporary elevated platform and supporting structure used for providing access to and supporting workmen or material or both, CR

“structure” any building, steel or reinforced concrete structure, railway line, or siding, bridge, waterworks, reservoir or pipeline, cable, sewer, sewage works, fixed vessel, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plant, pylon, surface and underground tanks, earth retaining structures or any structure designed to preserve or alter any natural feature, and any other similar structure;

(b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or

(c) any fixed plant in respect of work, which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk to persons falling 2 metres or more. C R

6.

Statutory Obligations

Description

Legislation
BCE

6.1. Basic Conditions of Employment Act

The relevant sections are to be complied with special attention to at least the following –

Working hours,

Conditions of employment and Remuneration,

Termination of employment,

Employment of child labour prohibited.

6.2. Compensation for Occupational Injuries and Diseases Act 1993 (Act No 130 of 1993)

COIDA

The Act provides for compensation for health conditions, death, diseases and or injuries that arises out of and in the course of an employee's duties.

All employers-Principle contractor and Contractors must register with a compensation insurer – either COIDA or FEMA.

They must be in good standing – have proof of having paid their current assessment - in the form of either a receipt of payment or a letter of good standing from their compensation insured prior to commencing work on the project with a copy on Site.

6.3. Occupational Health and Safety Act 1993 (Act No. 85 of 1993)

OH&SA

The OH&SA is the primary law regulating occupational health and safety matters.

The Act is a framework Act that provides for the development of detailed rules and standards through regulation.

As a framework, the Act prescribes that -

(a). the employer must provide and maintain a safe and healthy working environment for his employees and any person, who may enter onto the premises,

(b). the duties of employers to their employees, employees to their employer and suppliers to the employer and ©. the “reasonable man” approach by the employer in decisions concerning occupational health and safety, (f). the management, application and

enforcement of the Act and regulations are the responsibility of the employer i.e. be he the appointed agent where applicable, Project Managers, each principle contractor and contractor.

(g). each principle contractor and contractor shall have a copy of the Act which must be available on site at all times. Employees are to be allowed reasonable access to the Act during normal working hours.

NB Interpretation

Where there is any question as to the interpretation of any legislation and an agreement cannot be reached the matter is to be escalated from contractor to Principle contractor to the client.

Should the matter still not be resolved it needs to be referred to the Provincial Director – Department of Labour.

7. Project Management

Description	By whom	Legislation
7.1. Notification of Construction Work.	Principle Contractor!	CR 3.1
7.2. Health and Safety Specification The Health and Safety Specification from the Client must be referred to when preparing this Health and Safety Plan.	Client to provide.	CR 4. (1)(a)
7.3. Health and Safety Plan This Health and Safety Plan reflect the procedure that will be implemented to ensure legal compliance during Construction Work.	Contractor	CR 5. (1)
7.4. Health and Safety File All documentation – minutes of health and safety committee meetings, risk Identifications / assessments, legal compliance audits, induction and other training including service records of equipment and machinery etc must be included in the file.	Contractor	CR 5. (7)
7.5. Agreement with Mandatory A written agreement will be entered into between the Client and the Agent, the Agent and each Contractor.	Client / Agent / Principle and Contractor	Act Sec 37(2)
7.6. Appointment of each Contractor by the Agent.		C R 5 (3) (b)
7.7. Organisation chart		
7.7.1. Assignment of Duties Mr _____ is assigned the duty of ensuring that the requirements of the Act and Regulations and this Health and Safety Plan are complied with during the Construction Work.	Contracts Manager	Act Sec 16(2)
7.7.2. Construction Supervisor Mr _____ is appoint, in writing a competent employee to supervise the day-to- day construction work on the project. The supervisor will manage and control all construction activities in the absence of the Sect 16(2) assignee.	Site Agent	CR 6. (1)
7.7.3. Sub-ordinate Construction Supervisor. Mr _____ is appointed to be in control of the project in the absence of the Site agent appointed in terms of Construction Regulation 6. 1. NB Under no circumstances may a contractor leave employees on the site unless there is a competent construction work supervisor present.		CR 6. (2)
7.7.4. Construction Safety Officer Mr _____ has been appointed a part – time construction safety officer for the duration of the project.	Part-time/Full-time	CR 6. (6)

7.7.5. Contractors

CR 5. (3)(b)

An up dated list of Contractors will be kept and maintained on Site.

Company:

Activity:

Address

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular -

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile -
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone -
Cellular –

Facsimile
Email:

Company:

Activity:

Address: P O Box

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile –
Email:

Company:

Activity:

Address: P O Box 1254 –

Contact person:

Contact numbers: Telephone –
Cellular –

Facsimile
Email:

Every contractor is responsible to ensure that his employees comply with the applicable legislation and this health and safety plan.

NB A section 37(2) Agreement with Mandatory must be entered into between the contractors and the principle contractor.

NB Contractor who contracts out construction work

Where a contractor contracts construction work out to another contractor he becomes the Principle Contractor and a section 37(2) agreement must be entered into.

7.7.6. Designation of the Health and Safety Representative / s

Act sect 18

Mr _____ is a designated health and safety representative.
He will perform his prescribed duties in his area of responsibility.

Act sect 18(1) (g)

7.7.7. Appointment as the Risk Assessor / Facilitator.

C R 7(1)

Mr _____ is appointed to identify and record the risks associated with tasks being or that will be performed. These assessments must be reviewed as and when necessary.

7.7.8. Scaffold Inspector: _____

C R 14(2)

Mr _____ is appointed for this project.
Scaffolds must be inspected as prescribed and the findings reflected in the register provided.

8.

Incident Management – Occupational Health and Safety

8.1. Incidents and or injuries

A policy of ZERO tolerance is the target for the project.

Every thing reasonable and practicable must be adopted and actively implemented to prevent any incident or injury.

Every possible danger or hazard must be identified, documented, analysed and the appropriate action to mitigate and or reduce them implemented.

The necessary training of employees must be identified and introduced.

TARGET - NO FATAL OR DISABLING INJURIES

Report to inspector regarding certain incidents

Sect 24

Each incident, which occurs at work or that, arises out of or in the course of his employment that could either result in the employee's death that he loses a limb or part of a limb, becomes unconscious or that he is unable to continue with his normal duties for a period of 14 days must be reported to the relevant Provincial Director of Labour.

8.1.1. no person shall without the permission of an inspector, in the event of an incident described in (1) above disturb the site –

NB Although incidents, which occur on a public road or that, are aviation related must be reported if it arose out of and in the course of the employee's employment.

Domestic incidents are excluded.

Definitions.

Accident

C O I D Def

Means an accident arising out of and in the course of an employee's employment and resulting in a personal injury, illness or the death of the employee.

Occupational disease

Means any disease contemplated in section 65(1) (a) or (b). NB It includes conditions resulting from exposure to items either used and or exposed to in work place.

Occupational injury

Means any personal injury sustained as a result of an accident.

Classifications.

Fatal - Where the employee dies.

Disabling - When an employee cannot continue to perform the duty he was employed for.

Lost time incident - When an employee does not return to perform the work he was employed for on the next normal working day.

Disabling Lost Time - When an employee sustains an injury on duty and does not return to perform the duties he was employed to do on the next normal working day.

Medical treatment incident - When an employee sustains an injury at work and requires medical – more than first aid treatment i.e. medical, surgical, hospital or skilled nursing services.

First Aid case - Where the wound is treated from the contents of a first aid box

Disabling Lost Time Injury Frequency Rate (DIFR) It is the number of disabling injuries, including a death multiplied by 1 million (1,000,000) divided by the total number of man-hours worked by all employees on the project for a specific month or the project to-date.

$$\text{DIFR} = \frac{\text{No of disabling lost time injuries} \times 1,000,000}{\text{Total man-hours work for the period under review}}$$

8.1.2. Reporting.

COIDA

An incident must be reported to the relevant Provincial Director and on the prescribed W.CL 2(E) document and within the prescribed time frame i.e. when the employer becomes aware of or the incident was reported to him.

8.1.3. Recording.

All incidents must be recorded on a document similar to the injury statistic form provided.

8.1.4. Investigation.

Sect 31

The severity of the injury will dictate whom and when the investigation must be conducted.

Where reasonable and practicable all incidents must be investigated prior to the end on the shift on which it occurred, reported to or his employer became aware thereof.

Fatal and serious injuries must be investigated before the end of the shift on which it occurred or as soon as reasonably practical after the occurrence.

A team consisting of the Principle Contractor, the construction safety officer and the health and safety representative in whose area the incident occurred must conduct the incident investigation.

Where an employee of a contractor is injured the contractor and the health and safety representative for the area in which it occurred will be part of the team.

The client or his agent may if they wish form part of the team.

A record of the proceeding including signed statements, the name of the person conducting the investigation and persons assisting team members must be kept. All photographs etc must also be kept in the health and safety file.

NB In the event of a fatal, or potentially fatal incident the relevant DoL and the nearest South African Police Services station must be contacted.

The scene of the incident may only be altered or disturbed with permission of an inspector or when it is necessary to rescue a person or lives in danger.

8.1.5. Analysis.

The statistics for the total project, each principle contractor and contractor must be analysed to ascertain if there is or if any trends are developing by the construction safety officer or a competent person appointed by the client, his agent, the principle contractor's and all contractors.

8.1.6. Statistics.

Comprehensive incident / injury statistics must be kept for the total project i.e. the Principle contractor and every contractor. The following information must be recorded and kept on the health and safety file of the principle contractor / s and the contractor / s.

The client or where applicable his appointed agent must ensure that the relevant statistics are collected, recorded, analysed and the appropriate action instituted.

Where a construction safety officer is appointed it will form part of his duties and responsibilities.

Statistics must be kept in the format, suggested which is attached to this document.

The following incidents must be recorded – Fatal, disabling lost time, days lost, medical and first aid cases and man-hours worked. Statistics for the month under review and for the project to-date must be kept either together on one or more documents.

NB The Compensation Commissioner still refers to and reports the Disabling Injury Frequency Rate (DIFR). It has been decided to use the same formula. Contractors may use 200,000 in the formula. However they need to multiply by 5 to reflect the COIDA statistic rate.

8.1.7. Occupational disease / conditions

These must be reported and recorded as prescribed.

COIDA

8.1.8. Medical certificate of fitness.

A medical certificate of fitness, valid for 1 year must be available on the premises at all times for employee working on or operating the following:

- i) working in an elevated position,
- i. suspended platform,
- ii. Cranes – mobile - tower
- iii. Construction vehicles.

R 8. (2)(b)
CR 15(12) (a)
CR 20(g)
CR21 (1) (d)(ii)
CR 7. (1)

During the process of task analyses and or risk assessment it is possible that other tasks may indicate that a medical certificate of fitness is necessary.

The prescribed conditions will apply as though it was legislated.

8.2. Health and Safety Committee

Sect 19(4)

8.2.1. Composition.

Sect 19

The duly nominated, elected and designated employees, as health and safety representatives will serve on a health and safety committee.

The Health and safety representatives will be required to attend the health and safety committee meetings.

The Client and his appointed Construction safety officer are ex-officio members.

8.2.2. Meetings.

Meetings will be held on the day, date, time and place as mutually agreed upon by the health and safety representatives and management. The frequency will also be determined by the aforementioned.

Where the Principle Contractor has established a Health and Safety Committee the designated Health and Safety Representative shall serve on the Committee and the formula applied.

8.3. Legal compliance audits

8.3.1. Audit schedule

The attached schedule or a similar one approved by the Client and or the Principle contractor must be used. The person conducting the assessment must report in writing any major deviations observed and where reasonable, practicable the corrective action recommended, the party responsible to take the action and a date by which such must be implemented.

8.3.2. Audit frequency.

An internal legal compliance audit will be conducted monthly.

CR 4. (1)

A legal compliance audit will be conducted by an external / independent auditor one (1) per month.

8.3.3. Analysis.

Each audit report must be tabled and discussed at the next relevant health and safety committee meeting. The chairman shall make any appropriate comments and or recommendations and sign the minutes.

The Client, Principle Agent must receive a copy of the minutes.

The audit of the contractors must be consolidated, analysed and submitted to the principle contractor and the client.

The findings will be documented, analyses and recommendations made.

Where necessary the client / agent will be consulted with to ascertain if additional resources and or finances are required.

The action agreed on i.e. the responsible man test - and the time scheduling must be implemented.

As the project progresses it may become necessary to increase the frequency of audits.

NB The construction safety office will assume and be appointed to perform these functions.

9. Log books and Registers.

9.1. First aid Equipment

GSR 3(3)

Mr _____ has been appointed the first aid attendant for the project.

The prescribed contents of a first aid box will be available on the project and will be under the control of the first aid attendant.

9.2. Fire fighting appliances,

Mr _____ is appointed to inspect at the prescribed interval and record his findings in the appropriate register.

CR 27 (g)

9.3. Access Scaffolding.

Mr _____ has been appointed to inspect access scaffolding as prescribed.

10. Risk Management

The prescribed risk identification, assessment and where necessary a method statement will be completed prior to coming on site where possible.

As and when additional information etc is received concerning new or additional tasks the necessary risk identification, assessment must be conducted and approval obtained.

Risks assessed that suggest a need for a change in design or other corrective action will be referred to the architect / designer or the client or his agent.

Employees must receive, and sign acknowledgment of having received appropriate training, that they understood the requirement and would apply the knowledge.

Mr _____ is appointed the competent person to conduct the risk assessment.

11. Education and Training

11.1. Induction Training

No person will work on this project, or enter or be allowed to remain on the premises unless they have received and acknowledged in writing that they have received, understood and accept the conditions detailed in the induction programme.

A comprehensive list of all induction training given must be kept in the health and safety files and reported on, to management at least monthly. Training sessions must be conducted at least weekly.

NB Occasional visitors, client, agent, architect etc must be re-inducted when significant progress has been made on the project – risk, potential risks become apparent.

11.2. Site-specific training.

Site-specific training requirements will be identified.

Where applicable a certificate on competency must be must be available – or a certified copy – on the site.

12. Evacuation procedure

12.1. The Clients or Principle Contractors evacuation procedure will be communicated to all employees.

12.2. All Company employees will report to their assembly point - the site office.

12.3. Definition of an emergency:

An emergency is a major occurrence such as a fire, bomb threat, chemical spillage, explosion, aircraft crash, or a natural disaster i.e. earthquake / cyclone, which could result in injury, loss of life, or extensive damage to property and the environment.

12.4. Alarm

An audible alarm will be sounded to warn employees of an emergency and also when the situation returns too normal.

12.5. Employee response to an alarm.

Stop working,

If you are using an electric or pneumatic tool switch it off place it on the ground and proceed to the assembly point.

Report to your Supervisor

12.6. Employee response to the all-clear signal.

Return to your working area and proceed with the task you were busy with prior to the evacuation.

Fire: _____	3 Short sharp blasts
--------------------	-----------------------------

Serious Incident : _____	Long – short – long blasts
All clear : _____	5 seconds

13. Environmental Management.

Pressure on natural resources, including land, has continuously increased, as the population increases and likewise, awareness of the need to lessen the negative impacts of development and construction on the environment will continue to increase.

Every effort must be made to use environmentally friendly paints and where possible water-based.

The containers once emptied must be disposed of at an approved disposal site or returned to the supplier.

14. Ergonomics

Ergonomics is “the study of work”. Ergonomics therefore is the Profession that studies and analyses people at work, the work systems, and how best they fit together.

Much of the work done on Construction Sites is by its very nature an ergonomic problem, because it requires physical work to be done above head height, and below waist level, aggravated by constructions materials being heavy and/or inconveniently sized and shaped, which presents further manual materials handling issues.

16 Health and Safety Communication

Minutes of all health and safety committee meetings shall after acceptance shall be displayed, strategically placed on a site notice board.

Where appropriate Newspaper clipping may be used during “tool box” talks and induction training. Any change in company policy or legislation the may affect employees must be communicated to employees as soon as is reasonable and practicable.

17. Safe work procedures.

A programme of safe work procedures is the be embarked on starting with those identified during the risk identification and assessment. Where reasonable and practicable steps have been taken and elements of risk still remain a procedure needs to be developed.

The employees required to perform them must receive adequate training. Proof of training must be kept and be available on the premises.

All procedures need to be documented.

18. Personal Protective Clothing and equipment.

PPE may only be issued only after all reasonable and practicable steps have been taken to remove or reduce the hazard and or potential hazards. Act sec 8(2)
GSR 2(2)

All items issued must be maintained in good working order i.e. serviced and repaired as and when necessary. Items must be issued free of charge and for the personal use of the employee.

The employee shall sign acknowledgement of receipt of the items that he will use it, them as prescribed and that he has received the necessary training in the use and care of the items.

The principle contractor and contractor must take all reasonable steps to ensure that PPE issued is used, worn and maintained as described. GSR 2(6)

19. Project / Site Security.

19.1. Barricading and maintenance

Adequate and suitable solid barricading must be erect and maintained to prevent unauthorised entry as well as to control access onto and off the site.

Suitable information signs must be strategically positioned.

They will include but not be limited to the following – No unauthorised entry, all visitors must report to the Site office, personal protective clothing / equipment must be worn etc. NB Project / Site management are responsible for all activities taking place on the premises, and people who enter onto or who are allowed to remain on the site.

19.2. Access control

The Client is responsible for the access to and egress from the construction area.

20. Implementation costs.

The cost of implementation should include but are not limited to the following-

20.1. Administration

Project registration,

Occupational health and safety plan and file,

All assignments, appointments and designation,

Risk identifications and assessments and Logbooks and registers,

Health and safety committee meetings and minutes.

20.2. Training and Education

Induction training and badges,

First aid,

Health and safety representatives

Others - specify,

20.3. Legal compliance audits and reports.

Monthly or as required by the client.

20.4. Personal Protective Equipment and Clothing.

20.5. Other.

Site-specific requirements are to be specified.

Conclusion

This Health and Safety Plan has been developed and after negotiation with the Agent accepted. This approved plan will be made available to each Contractor prior to their commencing construction work on the project.

We the undersigned do hereby acknowledge receipt of, understand and accept the contents of this Health and Safety Plan.

Client

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Principle Contractor

_____ Name	_____ Signature	_____ Designation	_____ Date
---------------	--------------------	----------------------	---------------

Koedoespoort Depot

A - TOTALS	
Paul Total	
Arthursvlew Total	
Tussenin Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

BILL OF QUANTITIES - PAUL

[illegible]

* Contractor to determine

BILL OF QUANTITIES - TUSSENIN

[illegible]

* Contractor to determine



BILL OF QUANTITIES - ARTHURSVIEW[illegible]

* Contractor to determine

PART C3: SCOPE OF WORKS

A - TOTALS	
Hlungwana Total	
Mqwabe Total	
Sikame(D) Total	
Skume(D) Total	
Mpaseni(D) Total	
Dubula Total	
Eqwasha Total	
Mpanda(D) Total	
Kombe(D) Total	
Cwaka(D) Total	
Insese(D) Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT						
Item No.	Description	Country of Origin	Exchange Rate	Rate	Quantity	Amount/Cost
				TOTAL		

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

BILL OF QUANTITIES - HLUNGWANA

[illegible]

ⁿ Contractor to determine

[illegible]

Contract
Part C2: Pricing Data



Scanned with CamScanner

BILL OF QUANTITIES - SIKAME

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	SIKAME SUBSTATION 88KV (DOUBLE UNIT)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismatle/remove old Primary Oil Circuit Breaker.	Complete	2					
4.0	Dismatle/remove old Steel structure.	Complete	2					
5.0	Transport old uncontaminated equipment to depot.	/Site	2					
6.0	Dertermine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	2					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	2					
5.0	Supply and install Polycarbonate Box.	each	2					
C	<u>Other(Specify):</u>							
D COMMISSIONING								
1.0	Site Tests and Commissioning							
						Sikame	Total	

* Contractor to determine

BILL OF QUANTITIES - SKUME

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	SKUME SUBSTATION 88kV (DOUBLE UNIT)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	2					
4.0	Dismantle/remove old Steel structure.	Complete	2					
5.0	Transport old uncontaminated equipment to depot.	/Site	2					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	1					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	2					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	2					
5.0	Supply and install Polycarbonate Box.	each	2					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Skume	Total	

* Contractor to determine

BILL OF QUANTITIES - MPASENI

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	MPASENI SUBSTATION 88kV (DOUBLE UNIT)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	2					
4.0	Dismantle/remove old Steel structure.	Complete	2					
5.0	Transport old uncontaminated equipment to depot.	/Site	2					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	2					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	2					
5.0	Supply and install Polycarbonate Box.	each	2					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Mpaseni	Total	

* Contractor to determine

BILL OF QUANTITIES - DUBULA

[illegible]

* Contractor to determine

BILL OF QUANTITIES - EQWASHA

[illegible]

* Contractor to determine

A - TOTALS

B - IMPORTED CONTENT

Contract

Part C2: Pricing Data

Witbank Depot

C - RATES				
No.	Item	Unit	Rates	
			Labour	Material and Equipment
1	Removal of existing foundations.	Per Breaker		
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker		
3	Dechlorination.	Per Breaker		
			TOTAL	

Witbank Depot

A - TOTALS	
Bronkhorstpruit Total	
Crown Douglas Total	
Witbank Total	
Uitkyk Total	
Derwent Total	
Arnot Total	
Sunbary Total	
Dalmanutha Total	
Nitens Total	
Kleindam Total	
Wapadskloof Total	
Sterkloop Total	
Stoffberg Total	
Ert's Total	
Laersdrift Total	
Hammien Total	
Roosenekal Total	
Training	
GRAND TOTAL	

B - IMPORTED CONTENT				
Item No.	Description	Country of Origin	Exchange Rate	Amount/Cost
TOTAL				

C - RATES			
No.	Item	Unit	Material and Equipment
1	Removal of existing foundations.	Per Breaker	
2	Transporting of PCB contaminated oil and equipment from main depot.	Per Breaker	
3	Dechlorination.	Per Breaker	
TOTAL			

[illegible]

Contract
Part C2: Pricing Data



BILL OF QUANTITIES - CROWN DOUGLAS

[illegible]

* Contractor to determine



BILL OF QUANTITIES - WITBANK

[illegible]

^a Contractor to determine



BILL OF QUANTITIES - UITKYK

[illegible]

* Contractor to determine

BILL OF QUANTITIES - DERWENT

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	DERWENT SUBSTATION (132kV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismantle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and install Polycarbonate Box.	each	1					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Derwent	Total	

^a Contractor to determine

BILL OF QUANTITIES - ARNOT

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	ARNOT SUBSTATION (132kV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismatle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismatle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	1					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (Including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and install Polycarbonate Box.	each	1					
C	<i>Other(Specify):</i>							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Arnot	Total	

* Contractor to determine

BILL OF QUANTITIES - SUNBARY

ItemNo.	Description	Unit	Quantity	Mat./Equip Unit Rate	Labour Unit Rate	Mat./Equip price (Total)	Labour price (Total)	Total (Labour + Equipment)
	SUNBARY SUBSTATION (132kV)							
A								
1.0	Preliminary and General / Site Establishment.	/Site	1					
2.0	Drawings and Manuals (Appendix 1 of specification CEE0224 Issue 2002).	Complete	1					
3.0	Dismantle/remove old Primary Oil Circuit Breaker.	Complete	1					
4.0	Dismantle/remove old Steel structure.	Complete	1					
5.0	Transport old uncontaminated equipment to depot.	/Site	1					
6.0	Determine TPH Levels in soil.	/Site	1					
7.0	Disposal of contaminated Soil.	/Site	1					
8.0	PCB Testing.	/Site	1					
B								
1.0	Soil Type Survey BBF1389 (clause 7.5.1.1)	/Site	1					
2.0	Excavate and cast new foundation for Primary Circuit Breaker.	each	*					
3.0	Supply and install new Primary Circuit Breaker support steel structure.	Complete	1					
4.0	Supply and install new Primary Circuit Breaker (including cabling, interconnection, earthing etc).	each	1					
5.0	Supply and install Polycarbonate Box.	each	1					
C	Other(Specify):							
D	COMMISSIONING							
1.0	Site Tests and Commissioning							
						Sunbary	Total	

* Contractor to determine

BILL OF QUANTITIES - DALMANUTHA

[illegible]

* Contractor to determine

BILL OF QUANTITIES - NITTENS

[illegible]

* Contractor to determine

BILL OF QUANTITIES - KLEINDAM

[illegible]

* Contractor to determine



[illegible]

* Contractor to determine