

# THE CONTRACT

**PART C3 SCOPE OF WORKS**

**PART C4 SITE INFORMATION**

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*Contractor*

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## PART C3: SCOPE OF WORK

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### **C3.1 DESCRIPTION OF WORKS**

#### **C3.1.1 General Description of the project**

The project entails the upgrading of the crèche of +/-240m<sup>2</sup>, steel mesh fence of +/-200m, Septic tank, VIP toilet, drilling of borehole and installation of a 10kl JoJo Tank.

#### **C3.1.1 Employer's Objectives**

The employer's objectives are to deliver public infrastructure using labour intensive methods in accordance with EPWP Guidelines

##### **Labour-intensive works**

Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of this Scope of Work.

##### **Labour-intensive competencies of supervisory and management staff**

Contractors shall engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/Supervisors at NQF "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/Manager at NQF level 5 "Manage labour-intensive Construction Processes" or equivalent QCTO qualifications.

#### **C3.1.2 Overview and Location of Works**

The work that must be executed under this contract is the construction of Mokhurumela Creche in Blouberg Municipality which falls under Capricorn District Municipality in Limpopo.

#### **C3.1.3 Extent of Works**

The scope of work comprise of the following:

- Establishment of the Contractor's and Engineer's facilities on site.
  - Construction of +/-200m perimeter galvanised fence and one 5m steel access gate and pedestrian gate.
  - Construction of approximately 240m<sup>2</sup> building
  - Construction of playground, complete with facilities,
  - Borehole equipped with 1500rpm electrical submersible pumps,
  - Elevated plastic tank (10000l)
  - Septic tank
  - Electrical connections
  - Office furniture
  - Desks, mattress and table for the children

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- Fully furnished kitchen
- Artistic work.

Note: The description of the works is not necessarily limited to the above items.

#### **C3.1.4 Location of the Works**

The following details provide the key elements of the project area.

- Municipal Area : Blouberg Municipality

Project area Locality: Latitude S 22° 58' 41.52" and Longitude E 28° 42' 1.08"

#### **C3.1.5 Temporary Works**

The temporary works will be in the form of providing alternative sanitation during the construction of the toilet structures.

#### **C3.1.6 General Information**

##### **C3.1.6.1 Drawings**

The reduced drawings contained in Annexure C5.2 that form part of the tender document shall be used for tender purposes only. Further drawings are to be provided on an on-going basis by the engineer.

Any information in the possession of the contractor, which the resident engineer requires to complete the as-built drawings, shall be supplied to the resident engineer before a certificate of completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the engineer. The engineer will supply all figured dimensions omitted from the drawings.

##### **C3.1.6.2 Power, Water Supply and Other Services**

The contractor shall make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost of providing these services will be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

##### **C3.1.6.3 Contractor's Camp Site and Security**

The contractor shall make his own arrangements regarding the establishment of a camp site and housing for his construction personnel and all regulations stipulated by the local authority shall be adhered to.

It is anticipated that the contractor's choice of a camp site will be influenced by the availability of telephone and electrical connections as well as the supply of potable water.

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Provision is made in these specifications for the erection of a security fence around the site offices. The contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and the employer will consider no claims in this regard.

**C3.1.6.4 Additional Requirements for Construction Activities**

C3.1.6.4.1 The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

C3.1.6.4.2 The contractor shall submit proposals in connection with directional signs to the engineer for approval.

**C3.1.6.5 Programme Requirements for Construction Activities**

The contractor shall programme his activities to be suitable in terms of his resources to complete the contract inside the stipulated time period.

**C3.1.6.6 Construction in Confined Areas**

It may be necessary for the contractor to work in confined areas. In certain areas the width of the fill material and pavement layers may reduce to zero and the working space may be confined. The method of construction in these confined areas depends on the contractor's construction plant. However, the contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

**C3.1.7 Labour Regulations**

**A27 Payment for the labour-intensive component of the works**

Payment for works identified in clause 3.1.3 "the Extent of the Project" in the Project Specifications as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

**A28 Applicable labour laws**

The Ministerial Determination for Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice N° R949 in Government Gazette 33665 of 22

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October 2010, as reproduced below, shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

**A29 Introduction**

This document contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.

A29.2 In this document –

- (a) “department” means any department of the State, implementing agent or contractor;
- (b) “employer” means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP;
- (c) “worker” means any person working in an elementary occupation on a SPWP;
- (d) “elementary occupation” means any occupation involving unskilled or semi-skilled work;
- (e) “management” means any person employed by a department or implementing agency to administer or execute an SPWP;
- (f) “task” means a fixed quantity of work;
- (g) “task-based work” means work in which a worker is paid a fixed rate for performing a task;
- (h) “task-rated worker” means a worker paid on the basis of the number of tasks completed;
- (i) “time-rated worker” means a worker paid on the basis of the length of time worked.

**A30 Terms of Work**

A30.1 Workers on a SPWP are employed on a temporary basis.

A30.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.

A30.2 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.

**A31 Normal Hours of Work**

A31.1 An employer may not set tasks or hours of work that require a worker to work–

- (a) more than forty hours in any week

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(b) on more than five days in any week; and

(c) for more than eight hours on any day.

A31.2 An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.

A31.3 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

### **A32 Meal Breaks**

A32.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

A32.2 An employer and worker may agree on longer meal breaks.

A32.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

A32.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

### **A33 Special Conditions for Security Guards**

A33.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

A33.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

### **A34 Daily Rest Period**

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

### **A35 Weekly Rest Period**

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

### **A36 Work on Sundays and Public Holidays**

A36.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

A36.2 Work on Sundays is paid at the ordinary rate of pay.

A36.3 A task-rated worker who works on a public holiday must be paid –

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- (a) the worker's daily task rate, if the worker works for less than four hours;
- (b) double the worker's daily task rate, if the worker works for more than four hours.

A36.4 A time-rated worker who works on a public holiday must be paid –

- (a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
- (b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

### **A37 Sick Leave**

A37.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.

A37.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

A37.3 A worker may accumulate a maximum of twelve days' sick leave in a year.

A37.4 Accumulated sick-leave may not be transferred from one contract to another contract.

A37.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

A37.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

A37.7 An employer must pay a worker sick pay on the worker's usual payday.

A37.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

- (a) absent from work for more than two consecutive days; or
- (b) absent from work on more than two occasions in any eight-week period.

A37.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

A37.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

### **A38 Maternity Leave**

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- A38.1 A worker may take up to four consecutive months' unpaid maternity leave.
- A38.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.
- A38.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- A38.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- A38.5 A worker may begin maternity leave –
- (a) four weeks before the expected date of birth; or
  - (b) on an earlier date –
    - (i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
    - (ii) if agreed to between employer and worker; or
  - (c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- A38.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.
- A38.7 A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.

**A39 Family responsibility leave**

- A39.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances -
- (a) when the employee's child is born;
  - (b) when the employee's child is sick;
  - (c) in the event of a death of –
    - (i) the employee's spouse or life partner;
    - (ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

**A40 Statement of Conditions**

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A40.1 An employer must give a worker a statement containing the following details at the start of employment –

- (a) the employer's name and address and the name of the SPWP;
- (b) the tasks or job that the worker is to perform; and
- (c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
- (d) the worker's rate of pay and how this is to be calculated;
- (e) the training that the worker will receive during the SPWP.

A40.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

A40.3 An employer must supply each worker with a copy of these conditions of employment.

#### **A 41 Keeping Records**

A41.1 Every employer must keep a written record of at least the following –

- (a) the worker's name and position;
- (b) in the case of a task-rated worker, the number of tasks completed by the worker;
- (c) in the case of a time-rated worker, the time worked by the worker;
- (d) payments made to each worker.

A41.2 The employer must keep this record for a period of at least three years after the completion of the SPWP.

#### **A42 Payment**

A42.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

A42.2 A task-rated worker will only be paid for tasks that have been completed.

A42.3 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

A42.4 A time-rated worker will be paid at the end of each month.

A42.5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

A42.6 Payment in cash or by cheque must take place –

- (a) at the workplace or at a place agreed to by the worker;
- (b) during the worker's working hours or within fifteen minutes of the start or

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finish of work;

(c) in a sealed envelope which becomes the property of the worker.

A42.7 An employer must give a worker the following information in writing –

- (a) the period for which payment is made;
- (b) the numbers of tasks completed or hours worked;
- (c) the worker's earnings;
- (d) any money deducted from the payment;
- (e) the actual amount paid to the worker.

A42.8 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it

A42.9 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

#### **A43 Deductions**

A43.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

A43.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

A43.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

A43.4 An employer may not require or allow a worker to –

- (a) repay any payment except an overpayment previously made by the employer by mistake;
- (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
- (c) pay the employer or any other person for having been employed.

#### **A44 Health and Safety**

A44.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

A44.2 A worker must–

- (a) work in a way that does not endanger his/her health and safety or that of any other person;

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- (b) obey any health and safety instruction;
- (c) obey all health and safety rules of the SPWP;
- (d) use any personal protective equipment or clothing issued by the employer;
- (e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

**A45 Compensation for Injuries and Diseases**

- A45.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.
- A45.2 A worker must report any work-related injury or occupational disease to their employer or manager.
- A45.3 The employer must report the accident or disease to the Compensation Commissioner.
- A45.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

**A46 Termination**

- A46.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.
- A46.2 A worker will not receive severance pay on termination.
- A46.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.
- A46.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.
- A46.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

**A47 Certificate of Service**

- A47.1 On termination of employment, a worker is entitled to a certificate stating –
- (a) the worker's full name;

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- (b) the name and address of the employer;
- (c) the SPWP on which the worker worked;
- (d) the work performed by the worker;
- (e) any training received by the worker as part of the SPWP;
- (f) the period for which the worker worked on the SPWP;
- (g) any other information agreed on by the employer and worker.

**A48 Contractor's default in payment to Labourers and Employees**

Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene.

The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

**A49 Provision of Handtools**

The Contractor shall provide his labour force with hand tools of adequate quality, sufficient in numbers and make the necessary provisions to maintain the tools in good and safe working conditions

**A50 Reporting**

The Contractor shall submit monthly returns/reports as specified below:

- Signed Muster rolls/pay sheets of temporary workers and permanent staff detailing the number, category, gender, rate of pay and daily attendance.
- Copies of certified identity documents of workers
- Number of persons who have attended training including nature and duration of training provided
- Assets created, rehabilitated or maintained in accordance with indicators in the EPWP M&E framework.
- Plant utilization returns
- Progress report detailing production output compared to the programme of works

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**C3.2 ENGINEERING**

**C3.2.1 Design**

- (a) The **Engineer** is responsible for the design of the permanent Works as reflected in these Contract Documents unless otherwise stated.
- (b) The **Contractor** is responsible for the design of the temporary Works and their compatibility with the permanent Works.
- (c) The **Contractor** shall supply all details necessary to assist the engineer in the compilation of the as-built drawings.

**C3.2.2 Engineer's Design**

- (a) Detail description of Works
- (b) General Works

**C3.2.3 Contractor's Design**

Where contractor is to supply the design of designated parts of the permanent Works or temporary Works he shall supply full working drawings supported by a professional engineer's design certificate.

**C3.2.4 Design procedures**

All designs and modifications thereto shall be communicated in writing and the contractor and engineer shall maintain master lists to record and track all transactions.

**C3.3 PROCUREMENT**

**C3.3.1 Preferential procurement procedures.**

The works shall be executed in accordance with the conditions attached to preferences granted in accordance with the preferencing schedule.

**C3.3.2 Scope of work**

The following portions of the works shall be subcontracted to CIDB registered contractors in accordance with the subcontracting procedures described hereunder.

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Competitive tenders shall be invited in respect of each of the above portions of the works in accordance with the relevant provisions of the latest edition of the CIDB Standard for Uniformity in Construction Procurement. The Contract Data in the associated procurement documents shall be based on the use of BIFSA Non-Nominated Subcontract for use with the JBCC Series 2000 Principal Building Agreement / CIDB Standard subcontract (labour only) / JBCC series 2000 Nominated / Selected Subcontract Agreement / SAFCEC General conditions of subcontract (2003 edition) (select appropriate option) / NEC Engineering and Construction Subcontract / NEC Engineering and Construction Short Subcontract with minimal project specific variations and amendments that do not change their intended usage.

The Employer shall evaluate the tenders received in accordance with the provisions of the Standard Conditions of Tender contained in Annex F of Standard for Uniformity in Construction Procurement. The evaluation panel shall comprise equal representatives from the Employer and from the Contractor.

The Contractor shall without delay enter into contract with the successful tendering subcontractor based on their accepted tender submission. The Contractor shall remain responsible for providing the subcontracted portion of the works as if the work had not been subcontracted.

#### **C3.4 CONSTRUCTION**

##### **C3.4.1 Works specifications**

###### **C3.4.1.1 Applicable SANS standardized Specifications**

The applicable standardized specifications for Contract shall be the following:

SANS A	-	General
SANS AB	-	Engineers office
SANS C	-	Site Clearance
SANS G	-	Concrete (structural)
SANS HB	-	Roof Coverings
SANS H	-	Metalworks
SANS DM	-	Earthworks (Roads, Subgrade)

Variations to SANS 1200 standardized specifications are given in an annexure to this C3 in this document. The following Particular Specifications are relevant to this Contract.

SANS A	-	General
SANS AB	-	Engineers office
SANS C	-	Site Clearance
SANS DB	-	Earthworks (pipe Trenches)
SANS DK	-	Earthworks (gabions and pitching)

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SANS G	-	Concrete (structural)
SANS L	-	Medium pressure pipelines
SANS LB	-	Bedding (pipes)

### 3.3.1 Plant and Materials

All materials used in the works shall, where such mark has been awarded for a specific type of material, bear the SANS mark.

### 3.3.2 Construction Equipment

The contractor's equipment for construction shall be adequate for the purpose required, of modern design and in good condition to carry out the works expeditiously. Should the Engineer be out of opinion that the equipment in use is in any way unsuitable for carrying out the in a manner or at a rate commensurate with the requirements of the contract, he shall have the right to call on the Contractor at any time during the progress of the works to provide such additional or improved equipment as may be necessary to meet these requirements

The Employer makes no provision in this contract for financial assistance to the Contractor for the acquisition of plant, machinery and equipment .

### 3.3.3 Existing Services

#### 3.3.3.1 Care of Existing Services

It is to be noted that construction work will be done adjacent to or traversing existing services. Prior to commencement of any constructional work in the aforesaid affected area, the contractor shall satisfy the Engineer that all necessary precautions with respect to setting out procedures have been taken by the Contractor to evade the existing services

The contractor shall, before starting any excavations, carefully search and probe the terrain for any existing services or indications of the presence of such services. A payment item is included in the schedule of Quantities for excavations by hand to locate known and unknown services. If other methods are to be used, the cost thereof is to be included in the Preliminary and General Payment items.

In addition if the proposed new services crosses underneath overhead power lines Belonging to Eskom as well as underground pipelines and communication cables Belonging to Telkom, the Contractor shall have to comply with all the requirements laid down by the relevant authorities when working in the vicinity thereof. The contractor shall be responsible for checking the locations of all such services with representative of the relevant authorities to ensure that no damage is caused by construction operations

Work executed within the road reserve of provincial or local road shall be carried out strictly in accordance with the requirements laid down by the relevant provincial or

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local authorities. These include the use of traffic signs, flagman and other requirements as applicable.

As the above work entails working in or close to an already developed enclosure. Special care must be taken so as not to disturb the functioning of the existing facilities.

#### **C3.4.2.4 REQUIREMENTS OF EXPANDED PUBLIC WORKS PROGRAMME**

##### **EPWP Special Project Specification**

As much as is economically feasible all work shall be implemented by employing Labour Intensive Construction methods. Over and above the normal Building and Allied works to be implemented by employing skilled and unskilled labour the works specified in the “Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP)” shall be undertaken using Labour Intensive Construction methods.

#### **EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR INTENSIVE WORKS**

Requirements for the sourcing and engagement of labour.

C.1.1. Unskilled and semi-skilled labour required for the execution of all labour intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

C.1.2. The rate of pay set for the SPWP is R ..... per task or per day.

C.1.3. Tasks established by the contractor must be such that:

- a) the average worker completes 5 tasks per week in 40 hours or less; and
- b) the weakest worker completes 5 tasks per week in 55 hours or less.

C.1.4. The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

C.1.5. The Contractor shall, through all available community structures, inform the local community of the labour intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

- a) where the head of the household has less than a primary school education;
- b) that have less than one full time person earning an income;
- c) where subsistence agriculture is the source of income.
- d) those who are not in receipt of any social security pension income

C.1.6. The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:

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- a) 55 % women;
- b) 55% youth who are between the ages of 18 and 35; and
- c) 2% on persons with disabilities.

### **Specific provisions pertaining to SANS 1914-5**

#### **C.2.1. Definitions**

**Targeted labour:** Unemployed persons who are employed as local labour on the project.

#### **C.2.2. Contract participation goals**

C.2.3. There is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.

C.2.4. The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

#### **C.2.5. Terms and conditions for the engagement of targeted labour**

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

#### **C.2.6. Variations to SANS 1914-5**

C.2.7. The definition for net amount shall be amended as follows: Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

C.2.8. The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

### **Training of targeted labour**

C.3.1. The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

C.3.2. The cost of the formal training of targeted labour, will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The employer must be furnished with a copy of this request.

C.3.3. A copy of this training request made by the contractor to the DOL provincial office must also be faxed to the EPWP Training Director in the Department of Public Works– Cinderella Makunike, Fax Number 012 328 6820 or email cinderella.makunike@dpw.gov.za Tel: 083 677 4026

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C.3.4. The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he/she is employed for 4 months or more.

C.3.5. The contractors shall do nothing to dissuade targeted labour from participating in the above mentioned training programmes.

C.3.6. An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of 1.3.4 above.

Proof of compliance with the requirements of 1.3.2 to 1.3.6 must be provided by the Contractor to the Employer prior to submission of the final payment certificate

#### **3.4.4.2 Connection to Existing services**

Prior to connection of new service to existing services, the Contractor shall ensure that the constructed services are clean and free of foreign matter and shall subsequently request the Engineer, in writing, to inspect such work. Only upon written approval of the Engineer, may connections to existing services be made

#### **3.4.4.3 Contractor to Notify Relevant Authority and the Engineer of Damaged Service**

In the event of any service being damaged or accidentally disconnected for any reason, the Contractor shall immediately contact the relevant authority for instructions and shall report the occurrence to the Engineer in Writing. The report shall include the reasons for the occurrence of the incident. When instructed the damaged is to be repaired as soon as possible to the approval of the engineer and authority. The contractor will be held responsible for paying all costs incurred by the service owner or himself as result of each incident where the relevant service was clearly identified before hand

#### **3.4.5 Site Establishment**

##### **3.4.5.1 Services and facilities provided by the employer**

a) Water

Potable water for human consumption is available at site. Although the supply is reasonably dependable, the supply cannot be guaranteed.

Potable water is to be used sparingly at all times.

b) Electricity /power supply

Electricity is available on site. The Employer cannot guarantee that electricity will be available at all times.

The Contractor shall be responsible for making his own arrangements to connect to the water, electric power and other services that he may require for construction purposes.

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The costs of making such arrangements, for meeting the condition imposed and for the metered consumption shall be paid by the Contractor, and his tender will be held to include for all such requirements throughout the duration of the Contract. All water including that used for testing will be charged for at the prevailing tariffs

#### **3.4.5.2 Facilities Provided by the Contractor**

The Contractor will be required to make his own arrangements for the provision of a suitable construction camp, offices and workshop. He shall be responsible for all negotiation with the relevant authorities and he shall comply with all requirements imposed by those authorities. Suitable sites available within the municipal area will be pointed out during the site inspection

Should the Contractor require additional storage sites outside of the municipal areas he will responsible for making his own arrangements at his own cost for such offices.

The facility shall be properly fenced around the perimeter. Temporary buildings and fencing are to be neat and presentable and the surrounding areas must be at all times be kept in a neat, clean and orderly condition. The costs associated with the provision of these items shall be borne by the Contractor. The Contractor will be required to remove all facilities and restore the site to its original condition on completion of works.

#### **3.4.5.3 Other Facilities and Services**

- Latrine and Ablution Facilities

It will be required of the contractor to provide temporary toilets and ablution facilities for his staff for the currency of the contract, to the standards laid down by the Authorities.

- Housing of Contractor's staff

The Contractor shall make his own arrangements for the housing of his Supervisory staff.

- Security

The Contractor will be responsible for providing adequate security for the works and for the site establishment . All costs associated with the provision of watchmen shall be borne by the contractor.

#### **3.4.5.4 Name Boards**

The Contractor shall provide for the installation of one name board. The size, design and contents shall be as indicated on the detail drawing.

The name board(s) shall be removed upon completion of the works.

#### **3.4.6 Site Usage**

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Contractor

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Employer

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The Employer expects the contractor, his staff or agents to maintain good public Relations with landowners, other contractors and members of the public at all time.

Access to the site will be arranged by the Employer with the contractor. The Contractor shall submit a list of all his staff to the Employer for the purpose of access control.

### **3.4.7 Permits and Way Leaves**

No way leaves are required on the project. The Contractor's staff will require Access permits to enter the site.

### **3.4.8 Alterations, Additions, Extensions and Modifications to Existing Works**

The Contractor shall verify all levels, alignment and dimensions of existing structures or components thereof prior to the commencement of any work to determine the compatibility with the proposed works. The Contractor shall notify the Employer's Agent of any discrepancies.

### **3.4.9 Water for Construction Purpose**

No water for construction purpose is available on site. The contractor shall make provision for procuring, transporting and storing of water for construction purpose at his own cost.

### **3.4.10 Survey Control and setting out of the Works**

#### **3.4.10.1 Survey control**

##### **1. Geometric Control**

The Bench Mark Control and topographical survey for the works has been established. The Contractor is to check the Bench marks and existing levels prior to construction and bring any discrepancies to the attention of the engineer

##### **2. Preservation and Replacement of Beacons and Pegs**

The contractor shall protect and preserve all survey marks. Any survey marks disturbed or removed without prior written consent of the Engineer shall be replaced by a Registered Land Surveyor at the expense of the Contractor

Any errors in construction levels or position resulting from use of disturbed bench marks shall be made good by the contractor at his expense

#### **3.4.10.2 Setting out the Works**

##### **1. Setting out**

The Contractor shall set out the works in relation to original points. Lines and levels of reference specified in the contract Data or notified by the Engineer. The Contractor shall be responsible for the positioning of all parts of the

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Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works

## 2. Construction Tolerance Control

The Contactor will be required to issue to the Engineer in writing certification of Construction accuracy at each of the following phases, before continuing with the next phase of Construction:

- a) setting out of works
- ii) Centre-line positions and levels to top of concrete pads footings/bases
- iii) Centre-lines to top of testing ground layers and final pavement layer

The Contractor shall only continue with the next phase of construction when directed by Engineer in writing.

Should any item or section of the Works be constructed outside the limits of tolerance specified, instruction for remedial or other measures will be issued by the Engineer. The Contractor will not be permitted to continue with the next phase of construction until remedial work has been completed to the satisfaction of the Engineer.

No claim for loss in material, production or time resulting from the Contractor's work being constructed outside the limits of tolerance specified, will be entertained.

## C3.5 MANAGEMENT

### 3.5.1 Planning and Programming

The Contractor shall supply within the period stated in the contract Data a suitable and realistic construction programme, cash flow diagram, and critical path diagram for the consideration of the Engineer. This programme shall show the proposed scheduling and methods of execution of the Works and the resources to be allocated to each item or phase of the work. Quantities proposed for execution during each week and the anticipated cash-flow based upon these quantities should be shown, due allowance being made for price escalations and retention moneys.

The programme shall take provision for the accommodation of other contractor's requirements. It will be required from the contractor to liaise with other contractors to ensure continuous co-ordination and execution of the scheduled work.

### 3.5.2 Recording of weather

### 3.5.3 The Contractor shall provide and install a rain gauge on site and shall record rainfall data in the site diary. A site diary will be issued to the Contractor.

### 3.5.4 Health and Safety

#### 3.5.3.1 Health and Safety Requirements

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The Occupational health and Safety Act, Act85 of 1993 shall apply to this contract.  
The Contractor shall comply with the Particular Specification for Occupational Health and Safety.

### 3.5.3.2 Protection of the Public

As the above entails working in an already developed area where services are provided to the general public special attention must be paid to the following aspects:

- a) No blasting or working with percussion tools will be allowed unless prior written approval from the Engineer and local authorities is obtained.
- b) Safety of the public must be of prime importance and the outmost care must be taken to ensure that the correct signs, barriers and warning devices are in place.
- c) Movement of construction equipment must be controlled on site at all times.

### Site meetings and procedures

The Employer's Representative and the Contractor shall hold meetings relating to the progress of the works at regular intervals and at other such times as may be necessary. The Contractor shall attend all site meetings and shall ensure that all persons under his jurisdiction are notified timeously of all site meetings should the Employer's Representative require their attendance at such meetings.

The Contractor shall keep on site a set of minutes of all site meetings, daily records of resources (people and equipment employed), a site instruction book, a complete set of contract working drawings and a copy of the procurement document and make these available at all reasonable times to all persons concerned with the contract.

### Water and electricity

The Employer does not warrant that any water supply or electricity supply that may exist is adequate for the proper execution of the works. The responsibility strategies in terms of the tabulation below that will apply to the contract is:

- a) water : A
- b) electricity : A

Service	Option		
	A Contractor responsibility	B Employer responsibility	C
Water	The Contractor is to provide, and remove and make good upon completion, all the necessary temporary	The Contractor shall make, and upon completion remove, all the necessary connections to the	The Contractor shall make, and upon completion remove, all the necessary connections and

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	plumbing connections and purchase water from the local authority for the works at his own cost.	Employer's water supply at designated points and make use of water free of charge for construction purposes only.	water meters to the Employer's water supply at designated points and be responsible for costs associated with all water consumed.
Electricity	The Contractor is to provide, and remove and make good upon completion, all the necessary temporary electrical connections and installations and purchase electricity from the local authority / ESKOM for the works at his own cost.	The Contractor shall make, and upon completion remove, all the necessary electrical connections to the Employer's electrical supply at designated points and make use of electricity free of charge for construction purposes only.	The Contractor shall make, and upon completion remove, all the necessary connections and meters to the Employer's electrical supply and be responsible for costs associated with all electricity consumed.

**SANS 1921-5, Construction and management requirements for works contracts – Part 5: Earthworks activities which are to be performed by hand.**

Clause	Specification Data
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**Essential Data:**

5.1	The depth of trenches which are to be excavated by hand is 1,5 metres.
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**Additional clauses:**

1	<p><b>Stone pitching and rubble concrete masonry</b></p> <p>All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, shall be collected, loaded, off loaded and placed by hand.</p> <p>Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.</p> <p>Grout shall be mixed and placed by hand.</p>
2	<p><b>Manufactured Elements</b></p> <p>Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper hand hold on them.</p>

**SANS 1921-6, Construction and management requirements for works contracts – Part 6: HIV/AIDS awareness.**

4.2.1(a)	<p>A qualified service provider is a service provider that is one that is accredited or provisionally accredited training service provider in the HIV/AIDS field.</p> <p>A list of accredited service providers can be obtained from the Construction SETA (CETA) (tel 011-265 5900), Health and Welfare SETA (HWSETA) (011-622 6852) or</p>
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Contractor



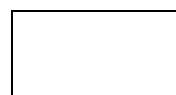
Witness 1



Witness 2



Employer



Witness 1



Witness 2



	on the Health and Welfare SETA website: <a href="http://www.hwseta.org.za">www.hwseta.org.za</a> .
4.2.1(a)	The HIV/AIDS awareness programme is to be repeated at four month intervals throughout the duration of the contract. (Four times in total, including the initial one at the start of the contract.)
<b>Additional clauses</b>	
	The duration of each workshop is not to be less than 2 ½ hours.

### 3.5.5 Particular / generic specifications

The management of the site shall be in accordance with the provisions of the COLTO Standard Specification for Road and Bridge Works for State Authorities (1998 edition), obtainable from the South African Institution of Civil Engineering.

### 3.5.6 Recording of weather

The Contractor shall erect an effective rainfall gauge on the site and record the daily rainfall figures in a book. Such book shall be handed to the employer's representative for his signature no later than 12 days after rain that is considered to justify an extension of time occurs.

The following template for the record purposes of rainfall should be used:

**Aug 10 Sep 10 Oct 10 Nov 10 Dec 10 Jan 11 Feb 11 Mar 11**

1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								

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Contractor

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Employer

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19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
<b>Total</b>								

And then summarised accordingly for each month:

<u>Month</u>	<u>Rainfall (mm)</u>	<u>Rainfall Days</u>	<u>Place Recorded</u>
<b>Total</b>			

### 3.5.7 Unauthorised persons

The Contractor shall keep unauthorized persons from the works at all times. Under no circumstances may any person except guards be allowed to sleep on the building site.

### 3.5.8 Management meetings

A progress meeting termed Site Meeting will be held within monthly intervals. The Contractor shall provide a venue and adequate seating for all members of the Project team i.e. The Client, The Engineer, the Ward Councillor, the Local Municipality's representative, members of the community's steering committee, the CLO, the Safety officer, any other stakeholders (e.g. Private Enterprise, Mentors etc) and key members of the Contractors staff. Site inspection meetings termed Technical Meetings will also be held within monthly intervals and is approximately held midway between Site Meetings. The Contractor shall in terms of the Health and Safety Regulations hold safety meeting weekly. The Minutes of the Safety meeting shall be submitted to the Engineer at every Site Meeting

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### 3.5.9 Forms for contract administration

The Contractor shall submit to the Engineer at every Site Meeting or by the 24<sup>th</sup> of every month the following schedules:

- 5.6.1 Labour Return Schedule (These forms are available electronically)
- 5.6.2 Plant Schedule
- 5.6.3 Copies of the Minutes of the Safety Meetings
- 5.6.4 Copies of the Site Diary Recordings
- 5.6.5 An updated Construction Programme

### 3.5.10 Electronic payments

The Contractor shall include on the Tax Invoice submitted with all claims the following banking details:

- Account Holder
- Bank Name
- Account Number
- Bank Branch Code
- Bank Branch Name
- Type of Account

The Employer is not under any obligation to transfer the Contractors payment electronically.

### 3.5.11 Daily records

The Contractor is to keep accurate daily records of the following items on an A4 Book in duplicate:

- Date
- Weather conditions (include rainfall mm and time recorded if applicable)
- Safety Measures (include signage installed, barriers, all measures undertaken with the time checked)
- Plant used
- Activities/ Production
- Labour used (differentiate between local and non-local)
- Problems or difficulties experienced
- Information request or if follow was made (include dates and times of correspondence)
- Training (if or when it is applicable)

### 3.5.12 Payment certificates

The Contractor shall submit the following information together with all claims to be verified and certified by the Engineer for payment by the Engineer:

- A detailed calculation sheet for all measurable items in accordance with the payment criteria relevant to that item.
- A complete schedule of quantities drawn up by the Contractor indicating all claims i.e. previous, present and accumulative with the total applicable to the accumulative quantities.

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Contractor

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Witness 2

Employer

Witness 1

Witness 2

- A comprehensive Summary Page indicating all previous payments, retentions, escalation totals, penalties, discounts, guarantee deductions, material claimed, other costs (e.g. acceleration), value added tax, subtotals and totals.
- Escalation CPA indices were applicable.
- Proof of payment for all Preliminary Sums (e.g. CLO, Training, Daywork items etc)
- Proof of material including delivery notes for all material claimed as material on site)
- An draft copy of the Tax Invoice

The Contractor shall ensure that the projected cashflow allows 48 hours for the processing of payment certificates by the Engineer. The Contractor has to receive written acceptance from the Engineer on behalf of himself and the Client if more than one payment certificated is permitted monthly.

### **3.5.13 Permits**

The Contractor's staff is not required by have security or entrance permits to enter the site.

### **3.5.14 Proof of compliance with the law**

- 3.5.11.1 Basic Conditions of Employment Act 1997
- 3.5.11.2 Occupation Health and Safety Act

### **3.5.15 Annexes**

A complete book of drawings is issued with this Tender Document. The Tenderers must ensure that they have received a full set of drawings and must return the set of drawings with the Tender

## **C3.6 PROJECT SPECIFICATIONS**

### **C3.6.1 VARIATIONS AND ADDITIONS TO THE STANDARDIZED SPECIFICATIONS AND PARTICULAR ADDITIONAL SPECIFICATION.**

#### **PSA GENERAL**

#### **PSA1 SPECIFICATION DRAWINGS (Clause 2.7)**

Specification Drawings may be included in this document as annexures to the Project and Particular Specifications. Where such Specification Drawings depict items and standard structures according to lay-outs and details differing from those shown in the Standardised Specifications, the layouts and details shown in the annexures to the Project and Particular Specifications shall be adopted.

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Employer

Witness 1

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**PSA2      QUALITY (Clause 3.1)**

All material used in the Works shall, where such mark has been awarded for a specific type of material, bear the SANS mark. Alternatively, the Contractor shall furnish the Engineer with certificates of compliance of materials, which bear the official mark of the appropriate standard.

**PSA3      PLANT (Clause 4.3)**

Except where the use of plant is essential in order to meet the specified requirements by the Due Completion Date, the Contractor shall use only hand tools and equipment in the construction of those portion(s) of the Works that are required in terms of the Project Specifications to be constructed using labour intensive construction methods.

**PSA4      TESTING (Clause 7)**

**PSA4.1** All test results obtained by the Contractor in the course of his process control of the Works shall be submitted to the Engineer or his Representative prior to requesting inspection of the relevant portions of the Works. Any request for inspection shall be submitted on the prescribed forms that are appended as annexure to the Specifications.

**PSA4.2** The Contractor shall make suitable arrangements for process control prior to commencement with the Works. Should he intend using site personnel for this purpose he shall ensure that suitably trained and competent personnel take charge of the necessary test work, and that the necessary equipment is at their disposal prior to commencement of the Works. Failure to comply with these requirements shall be just cause for the Engineer to order suspension of the Works without additional remuneration in terms of Clause 42 of the Conditions of Contract, or for him to recommend termination to the Employer in terms of Clause 58 thereof.

**PSA4.3** The Contractor shall deliver to the Engineer, for his consideration, quality assurance programmes (as obtained from all the Contractor's proposed suppliers of pipes, valves and specials) prior to the Contractor's appointment of any suppliers.

**PSA5      INSTRUCTIONS BY THE ENGINEER**

C. C.3.75

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

Site instructions by the Engineer, addressed to the Contractor at his office on the Site, will be numbered consecutively and will be deemed to have been received by the Contractor's Representative unless a break in the sequence of numbers is brought to the notice of the Engineer in writing immediately.

**PSA6      SITE MEETINGS**

The Contractor and his authorised representative shall attend all meetings held on the Site with the Employer and the professional team at dates and times to be determined by the Engineer. Such meetings will be held at maximum monthly intervals to evaluate the progress of the Contract, and to discuss matters pertaining to the Contract which any of the parties represented may wish to raise. It is not the intention to discuss day-to-day technical matters at such meetings.

**PSA7      PAYMENT (Clause 8.2)**

Monthly Progress Payment Certificates shall be submitted to the Engineer's Representative on Site not later than the 20th of each month (or on the last working day prior to this date) in order to allow for checking and reconciliation of all quantities, rates, extensions and additions in the certificate. Each progress payment certificate shall include work executed or reasonably expected to be executed up to the 30th day of the specific month. The Engineer's Representative shall have a period of five (5) calendar days to review the draft certificate in collaboration with the Contractor. All quantity calculations and certificates submitted by the Contractor for checking shall be in accordance with the standard formats that are included in Section 4.4C of Volume 1.

Upon agreement by the Engineer's Representative by not later than the 25th of each month, the certificate shall be submitted by the Contractor in a neat typed form in accordance with the prescribed format, and with the correct spelling, to the Engineer by not later than the 28th of each month (or on the first working day thereafter), together with four additional copies, for certification.

Where dayworks have been instructed by the Engineer, the Contractor shall submit the returns to the Engineer for signature and approval within twenty-four (24) hours of the end of the working day on which the work was executed. Daywork returns shall be submitted on forms following the standard format included in Section 4.4C of Volume 1 for this purpose. Failure to comply with the terms of this clause will result in non-payment for such dayworks.

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*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

The tax invoice submitted with the certificate shall be dated the 1st of the month following the period certified. All costs for the preparation and submission of progress certificates shall be borne by the Contractor.

**PSA8 SUMS STATED PROVISIONALLY (Clause 8.5)**

**PSA8.1 Contingencies**

A Provisional Sum has been included in Schedule 2 for contingencies. No percentage mark up will be applicable to any payments made using contingency money other than the mark up included in prices for variations determined in terms of Clause 40 of the Conditions of Contract.

**PSA8.2 Materials for Dayworks**

A Provisional Sum has been included in Schedule 2 for materials to be used during the execution of dayworks. In addition to the abovementioned amount, provision is made in Schedule 2 for a mark-up on the materials used during the execution of the dayworks by the Contractor. Payment made shall be regarded as full compensation for overheads, charges and profit on the materials that are used when executing dayworks.

**PSA8.3 Royalties for Borrow Materials**

A Provisional Sum has been included in Schedule 2 for any royalties that may become payable by the Contractor in obtaining suitable borrow materials from sources designated by the Engineer. Payment will be based on the royalties actually and necessarily paid. In addition to the above amounts, provision is made in Schedule 2 for a mark-up on any payments made by the Contractor in this regard. The mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in clause 48(2) of the Conditions of Contract.

**PSA8.4 Contract Price Adjustment**

A Provisional Sum shall be included for Contract Price Adjustment in the Summary of Schedules to make provision for contract price adjustment in terms of Clause 49(2) of the Conditions of Contract. The value of the Provisional Sum shall be based on the percentage of the subtotal value as specified in the

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Contractor

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Witness 2

Employer

Witness 1

Witness 2

Summary of Schedules. No percentage mark up will be applicable to any payments made in this regard.

**PSA 9 PRIME COST ITEMS (Clause 8.6)**

**PSA9.1 Artisan and Skills Training**

A Prime Cost Item has been included in Schedule 2 for payments to be made to specialists for the training of unskilled or semi-skilled persons in industry accredited management and generic skills. Payment to the Contractor will be based on invoices certified by the Engineer and issued by training specialists to the Contractor for work undertaken in terms of this item.

In addition to the above amounts, provision is made in Schedule 2 for a mark-up on any payments made by the Contractor in this regard. The mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in Clause 48(2) of the Conditions of Contract.

**PSA9.2 Acceptance Control Testing of Earthworks and Concrete Works**

A Prime Cost Item has been included in Schedule 2 for acceptance control testing of earthworks and concrete works ordered by the Engineer to be undertaken by a commercial laboratory. Payment will be based on the actual invoicing by the laboratory to the Contractor. In addition to the abovementioned amount, provision is made in Schedule 2 for a mark-up on any payments made by the Contractor in this regard. The mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in Clause 48(2) of the Conditions of Contract.

**PSA9.3 Telephone Calls and Rental**

A Prime Cost Item has been included in Schedule 2 for telephone calls and facsimile transmissions as well as rental and maintenance associated with the telephone(s) to be supplied to the Engineer's Representative(s) for the duration of the Contract as specified in section PSAB below. Payment will be based on call and rental costs, but excluding any deposits and installation costs which shall be priced under the preliminary and general items. In addition to the above amount, provision is made in Schedule 2 for a mark-up on any payments made by the Contractor. This mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in Clause 48(2) of the Conditions of Contract.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2



**PSA9.4    Salary for Labour Desk Officer**

A Prime Cost Item has been included in Schedule 2 for a salary to be paid to the Labour Desk Officer. In addition to the abovementioned amount, provision is made in Schedule 2 for a mark-up on the salary to be paid. This mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in Clause 48(2) of the Conditions of Contract.

**PSA9.5    Accommodation for the Engineer's Representative**

A Prime Cost Item has been included in Schedule 2 for accommodation and/or office rental and service costs for existing off site facilities for the Engineer's Representative(s) for the duration of the Contract.

In addition to the above amount, provision is made in Schedule 2 for a mark-up on any payments made by the Contractor. This mark-up shall be regarded as full compensation for overheads, charges and profits as provided for in Clause 48(2) of the Conditions of Contract.

**PSA10    ADJUSTMENT OF PRELIMINARY AND GENERAL ITEMS DUE TO RAIN**

Should the period for completion be automatically extended due to abnormal weather conditions occurring during execution of the Contract as provided for in the Project Specifications, no adjustment to the total for time-related preliminary and general items will be applicable.

**PSA11    ADJUSTMENT OF PRELIMINARY AND GENERAL TIME-RELATED ITEMS**

An approved extension of time, other than for abnormal weather conditions, will qualify the Contractor to receive additional payment for each relevant time related item at a unit rate based on the sum originally tendered for such item, and which shall be fair and reasonable as contemplated in Clause 40 of the General Conditions of Contract.

**PSAB    ENGINEER'S OFFICE**

**PSAB1    NAME BOARDS (Clause 3.1)**

C. C.3.79

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

One name board conforming to the standard requirements of the South African Association of Consulting Engineers and as shown in the book of drawings volume.2, must be provided and erected at places to be designated by the Engineer during the duration of the Contract for this purpose.

**PSAB2 OFFICEBUILDING (Clause 3.2)**

An office facility for the exclusive use of the Engineer's Representative will not be required. However, the office space and furniture made available by the Contractor as part of his site facilities shall be adequate for the shared use by himself and the Engineer's Representative.

**PSAB3 TELEPHONE (Clause 5.4)**

One cellular telephone of an approved type shall be provided for the exclusive use of the Engineer's Representative for the duration of the Contract.

The Contractor shall make all arrangements necessary for the provision of the cell phone, and shall pay all necessary deposits and installation costs that may be applicable. A prime cost item has been allowed in Schedule 2 to cover all call and rental costs that are associated with the provision of this facility for the Engineer's Representative.

**PSAB4 SURVEY ASSISTANTS (Clause 5.5)**

Two suitably educated Survey Assistants shall be made available for the shared use by the Contractor and the Engineer's Representative for the duration of the Contract.

**PSAB5 SURVEY EQUIPMENT**

No dedicated survey equipment is required. However, the survey equipment listed below shall be available on site and be maintained in good condition for the duration of the Contract for the shared use by the Contractor and the Engineer or his Representative. These instruments shall be made available within one hour of them being requested. Payment will be made as provided for in Schedule 1.

C. C.3.80

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

- |  |        |
|--|--------|
| (c) Automatic surveyor's level complete with tripod and leather carry case such as Zeiss N1-2 or equivalent.                   | 1 No   |
| (c) 20-Second tachometer with optical plumbob complete with tripod and leather carry case such as Sokkisha TM20C or equivalent | 1 No   |
| (c) Nylon coated steel surveyor's tape 100 m long and 10 mm wide   | 1 No   |
| (c) 5 m long three-piece telescopic survey staves (metric double face), complete with angle bracket level                      | 2 No   |
| (e) Triangular change plate with chain   | 2 No   |
| (f) Ranging rods   | 2 No   |
| (g) One metre long spirit level  | 1 No   |
| (h) Three metre aluminium straight edge  | 1 No   |
| (i) 2 kg hammer with rubber handle   | 1 No   |
| (j) Steel pegs, 300 mm long and 12 mm dia  | 120 No |
| (k) Aluminium tags, 100 mm long, 15 mm wide and 2 mm thick   | 120 No |
| (l) Measuring wheel  | 1 No   |
| (m) 100 m long 50 kg strength fish line  | 1 No   |

The following equipment shall be made available for the exclusive use of the Engineer or his Representative for the duration of the contract:

- |  |       |
|--|-------|
| (a) 5 m long steel tape                      | 1 No  |
| (b) Survey book (level)                      | 10 No |
| (c) Reverse polar notation pocket calculator | 1 No  |

## **PSAB6 CARPORTS**

The Contractor shall provide and maintain one carport with waterproof roofing for the duration of the Contract. The floor shall consist of crushed aggregate to alleviate dusty and muddy conditions.

## **PSAB7 LABORATORY**

No laboratory buildings or fittings are required by the Engineer. The Engineer will arrange for a commercial laboratory or designate specialists to carry out all

C. C.3.81

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

acceptance control testing including cube testing, but excepting for density control tests. See clause PSA9 for detail of the Prime Cost item provided for this purpose. The Contractor shall remain responsible for carrying out the process control testing that is required by the Standardised, Particular and Project Specifications.

The Contractor shall supply the following equipment and maintain same for the duration of the contract:

A Troxler nuclear system Model 3440, complete with accessories and stored in a suitable transit case as supplied by the manufacturer. A detailed description of the unit and principles of operation should be given in the manual for the nuclear instrument.

Six concrete cube moulds, 150mm nominal size.

The contractor must include the price for providing these equipment under the payment items "Facilities for the Engineer" in Schedule 1.

Upon completion of the Works, ownership of the equipment specified herein shall revert to the Contractor who shall remove same from Site.

C. C.3.82

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

**PSC SITE CLEARANCE**

**PSC1 DISPOSAL OF MATERIAL (Subclauses 3.1 and 8.2.1)**

Materials arising from clearing and grubbing shall be disposed of as may be ordered by the Engineer. Trees and stumps necessarily removed shall not be burnt unless authorized by the Engineer, but shall be cut and stacked at areas designated by the Engineer.

**PSC2 AREAS TO BE CLEARED AND GRUBBED (Clause 5.1)**

Only areas necessary for the construction of the Works will be cleared and grubbed.

**PSC3 PRESERVATION OF TREES AND SHRUBS (Subclause 5.2.3)**

The penalty in respect of every individual tree and shrub, designated as a tree or shrub to be preserved, that is damaged or removed unnecessarily by the Contractor, shall be R1 000. Trees that fall within areas upon which the Works are to be constructed or within areas that the Contractor must occupy for the proper construction of the Works will not be designated for preservation.

**PSC4 FREEHAUL AND OVERHAUL**

Refer to Clause PSD7 in this regard.

C. C.3.83

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

## **PSD EARTHWORKS**

### **PSD1 SAFEGUARDING OF EXCAVATIONS (Subclause 5.1.1.2)**

Any cost the Contractor may undergo in ensuring the safety of excavations or any additional excavation and backfilling he may have to undertake due to the unstable sides of excavations and trenches shall be held to his account and the various rates for excavation and trenching included in the Schedule of Quantities shall include full compensation therefore.

### **PSD2 EXPLOSIVES (Subclause 5.1.1.3)**

In addition to complying with the provisions of subclause 5.1.1.3 of SANS 1200D, the Contractor shall record for the information of the Engineer the spacing and loading of the charge in each blast and compliance with this requirement will not relieve the Contractor of any responsibility in terms of the said subclause.

### **PSD3 DISPOSAL OF SURPLUS MATERIAL (Subclauses 5.1.4.3 and 5.2.2.3)**

All surplus or unsuitable excavation materials (other than as described below) arising from trench excavations shall be spoiled and neatly spread and levelled along the route of the pipelines so as not to interfere with future works nor to disrupt the natural overland flow of storm run-off. Rocks, trees, debris and other unsightly materials shall be removed from alongside the trench to spoil areas that are designated by the Engineer for this purpose. Haul of excess material from excavation to spoil areas will not be required by the Engineer unless necessary for the neat and orderly finishing of the Site and its environs.

Generally pipeline trenches shall be left proud of the natural ground surface in order to allow for any consolidation of the backfill materials that may still occur after Completion of the Works. However, where the pipeline is laid within a road reserve the pipeline trench shall be finished neatly to be flush with the natural ground level or finished sidewalk level as may be applicable.

### **PSD4 ACCOMMODATION OF TRAFFIC (Subclause 5.1.6)**

Traffic must be accommodated along public roads whilst construction takes place. The Contractor shall make provision to ensure the safe passage of traffic using the road whilst construction is taking place, and to ensure that any disruption to traffic is kept to a minimum by undertaking half width construction or

C. C.3.84

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

by providing save detours, all as instructed by the Engineer. All detours shall be constructed and signs shall be erected and maintained in accordance with the latest issue of Road Signs Note 13 as issued by CSRA and CUTA.

The Contractor shall tender a lump sum against Payment Item 5.1.1 for accommodating traffic during the duration of the Contract, which sum shall cover all his obligations in this regard, including but not limited to temporary barricades, the erection and re-erection of existing and/or temporary traffic signs, lights and flagmen for the guarding and protection of the Works, and for making all necessary arrangements with the applicable traffic authorities. Payment shall be made monthly pro-rata to the overall progress of the Works.

**PSD5      BORROW PITS (Subclause 5.2.2.2)**

Bedding and backfill materials shall be obtained from trench excavations or borrow pits designated by the Engineer. Where borrow materials are required and ordered by the Engineer, such materials shall be obtained from borrow pits designated by the Engineer. The Contractor shall be responsible for the opening up and closing down of designated borrow pits. The Engineer will obtain the necessary permissions and authority to utilise such borrow pits. The Contractor in turn shall in all respects comply with the various requirements of SANS 1200D and of the Minerals Act (No 50 of 1991) in relation to the opening up, closing down and utilisation of borrow pits.

Except for the crushing or screening of materials in accordance with the written instructions of the Engineer, and for royalties, should such royalties become payable, no additional payment will be made for excavating or processing material from designated borrow pits, other than under the relevant payment items listed in the Schedules of Quantities.

The Contractor shall co-ordinate his borrowing operations with other contractors that might be using the same borrow pit(s).

The closing down of a borrow put will include all earth works required to leave the area in a neat condition without irregularities in the surface and with even slopes to the satisfaction of the Engineer and other concerned parties.

**PSD6      HAUL AND SPOIL ROADS**

C. C.3.85

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

The Contractor shall be responsible for the provision of all haul and spoil roads to borrow and spoil areas that he may require for the construction of the Works and that the Engineer may approve. No additional payment will be made in this regard.

**PSD7 FREEHAUL AND OVERHAUL (Subclause 5.2.5)**

All movement of earthworks undertaken along the route of the pipeline and to and from the spoil site shall be considered freehaul. Overhaul will be measured as long overhaul for all importation of borrow materials from borrow pits designated by the Engineer in writing. The haul distance will be measured to the nearest 0.1 km along the shortest practicable route approved by the Engineer and shall be measured in one direction only. The freehaul distance for importation from borrow areas will be 1 km. Short overhaul will not be measured for payment.

C. C.3.86



Contractor



Witness 1



Witness 2



Employer



Witness 1



Witness 2



**PSDB EARTHWORKS (PIPE TRENCHES)**

**PSDB1 SAFEGUARDING OF EXCAVATIONS (Subclause 5.1)**

Refer to Clause PSD1.

**PSDB2 SPECIAL WATER HAZARDS (Subclause 5.1.2.2)**

Where ground water is present during construction to such an extent that it could hamper the placing and consolidation of the granular or concrete bedding, as specified on the Drawings, or would cause buoyancy of the pipes, the Contractor is to notify the Engineer immediately, who will authorise the importation of crushed stone bedding material from commercial sources in order to assist with dewatering during the bedding, laying and backfilling operations associated with the pipeline, if he deems it necessary. In severe cases, and should the Engineer so instruct, the stone bedding should be wrapped in a suitable geotextile such as Kaymat U24 or similar approved. A suitable outlet point for the expulsion of underground water, caught up in such an underdrain, must be identified and an outlet structure constructed to the approval of the Engineer to facilitate the release of such water.

Crushed stone bedding material shall consist of nominal 19 mm crushed stone complying with the grading as specified for stone to be in concrete in Table 5 of SANS 1083 (as amended), and shall be well compacted in order to provide a uniform support of the pipe barrel.

At points designated by the Engineer, sumps shall be formed in the trench bottom from which ground water can be pumped in order to maintain the water table below the pipe bedding level during construction. The Contractor shall, if instructed, establish on site, operate and remove on completion, dewatering pumps of 25 l/s capacity, which shall be paid for under the applicable item allowed in Schedule 2 for this purpose. Lengths of trench opened at any one stage shall be limited by the dewatering capacity of the pump.

**PSDB3 ACCOMMODATION OF TRAFFIC (Sub-Clause 5.1.3)**

See Clause PSD4.

**PSDB4 EXISTING SERVICES (Sub-Clauses 5.1.4)**

C. C.3.87

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Where any existing service occurs within the specified trench excavation, and the presence of such service is known before being uncovered, then the protection of the service will be scheduled and measured as provided for in Clause 8.3.5 of 1200DB. Only known services (as defined in Clause 5.4 of 1200A) shall be measured for payment.

Where an unknown existing service is damaged during construction, and the Engineer orders that the Contractor should undertake the repair of such service, then such repair will either be measured and paid as day works or alternatively as a contractual variation in terms of Clause 40 of the General Conditions of Contract.

No construction activity which may affect the integrity of telephone or electrical poles or stays may be carried out without the prior written approval of the Engineer, which approval shall only be given subject to the acceptance of a modus operandi that will ensure the integrity of such structures during construction.

**PSDB5 TRENCH WIDTHS (Sub-Clauses 4.1 and 5.2)**

Trenches in general shall not exceed the widths laid down in Sub-Clause 8.2.3. If trenches exceed the specified width the Contractor shall be liable for the cost of any thicker pipes or more expensive bedding which may be required as a result of the additional trench width.

**PSDB6 TRENCH BOTTOMS (Sub-Clause 5.5)**

Replace the first paragraph of this sub-clause "Material that ..... compacted as directed" with the following:-

Where a firm foundation cannot be obtained at the grade indicated due to soft or unsuitable material, the Engineer may instruct the Contractor to remove such unsuitable material and to backfill the excess depth with approved selected material or concrete, as directed by the Engineer in each particular case, at the cost of the Employer. Backfill, other than concrete, shall be placed in layers of 100mm un-compacted thickness, each layer thoroughly compacted to the entire satisfaction of the Engineer, to provide adequate support for the pipe bedding to be placed on top of it.

C. C.3.88

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

Should the Contractor remove more ground than is required to secure the proper grade of the pipeline, the Contractor must, at his own cost, backfill the excess excavation with approved selected material or concrete, as directed by the Engineer in each particular case.

No pipes, concrete screeds, concrete beds or bedding material shall be laid in any trench before the trench have been inspected and approved by the Engineer's Representative.

**PSDB7 DISPOSAL OF EXCAVATED MATERIAL (Sub-Clauses 5.6.3 and 5.6.4)**

Refer to Clause PSD3.

**PSDB8 FREEHAUL AND OVERHAUL (Sub-Clause 5.6.8)**

The provisions of clause PSD7 will apply.

**PSDB9 AREAS SUBJECTED TO TRAFFIC LOADS (Clause 5.7.2)**

The requirements of Clause 5.7.2 shall apply only to pipes and sleeves crossing streets or paved areas and pipes running parallel to the road as described below.

All service trenches running parallel to the road of which the roadside edge of the trench is located less than 1.4 m away from the edge of the travelled way, will be subject to the requirements for the above mentioned clause.

The measurement and payment will apply to the full trench width. Pipes and sleeves crossing streets or paved areas will be measured and paid for to a length equal to the width of road or length of pavement crossed plus 1,4 m either side of the travelled edges.

Compaction of other pipe trenches running parallel to the roadway shall be considered areas subject to traffic loads only where instructed by the Engineer in writing. The volume will be computed from the minimum base width determined in accordance with Sub-Clause 5.2 and the depth from the top of the backfill to the top of the selected backfill layer as specified in Sub-Clause 8.3.3.1.

**PSDB10 REINSTATEMENT OF EXISTING BITUMEN SURFACED ROADS (Clause 3.6 and 5.9.4)**

C. C.3.89

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Pipe trenches through the existing bitumen surfaced roads shall be reinstated with a 150 mm upper selected subgrade layer compacted to 93 % mod AASHTO density, followed by two 150 mm subbase layers compacted to 95 % mod AASHTO density and a 150 mm graded crushed stone base compacted to 98 % mod AASHTO density. The road shall be provided with a 30 mm thick asphalt seal. The upper selected subgrade layer shall have a CBR of at least 15, a grading modulus of at least 0.75 and a maximum PI of 12. The subbase shall conform to SANS 1200 ME, the graded crushed stone to SANS 1200 MF and the seal to SANS 1200 MH.

#### **PSDB11 MEASUREMENT AND PAYMENT (Subclause 8.3.2)**

Trench excavations shall be measured volumetrically (irrespective of length) in depth increments as follows:

- Up to 1.5 m
- Exceeding 1.5 m but not exceeding 2,5 m
- Exceeding 2.5 m but not exceeding 3,5 m
- Exceeding 3.5 m but not exceeding 4,5 m

The volume for each of the above payment items is determined by multiplying the length of the trench falling within the depth range (as determined in accordance with drawing DB-2 of SANS 1200 DB) by the total trench depth and by the trench width (as determined by SANS 1200 DB clause 5.2), using any recognised method such as the end area or the Simpson's method, determining depths at no more than 20 m intervals.

Payment for the excavation and backfilling of trenches shall be made at the tendered rates and at the following stages of construction:

- Upon completion and approval of the trench bottom, prior to bedding: 40 %
- Upon completion and approval of top of selected backfill: 70 % (cumulative)
- Upon completion and approval of the main fill: Remaining 30 %

C. C.3.90

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

**PSG CONCRETE (Structural)**  
**PSG1 SCOPE**

This specification covers the requirements for water retaining structural concrete for civil engineering work

**PSG2 INTERPRETATIONS**

**PSG2.1 Definition**

For purpose of this Contract, all structures will be regarded as water retaining structures.

**PSG2.2 Exposure Conditions**

For the purpose of this Specification, Water retaining structures shall be deemed to be classified under clause 2.4.1.3 (severe conditions) as specified in SANS 1200 G unless specified otherwise in the project specification.

**PSG3 CEMENTITIOUS MATERIALS**

**PSG3.1 Applicable standards**

All cementitious material used in concrete shall comply with the following standards, as relevant:

Common cements

SANS ENV 197-1:1992 Cement B composition, specifications and conformity criteria B Part 1: Common cements

Cement extenders

SANS 1491: Part II-1989 Fly ash

**PSG3.2 Type**

The type of cementitious material to be used in concrete shall be one of the following:

A blend of materials, combined in the concrete mixer, comprising, by mass:  
70% CEM I (common cement) and 30% fly ash

**PSG4 AGGREGATES (Sub-clause 3.4)**

C. C.3.91

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

The following additional requirements shall be applicable to water retaining structures:-

**PSG4.1 Fine Aggregate**

Samples of the proposed fine aggregate shall be submitted to the Engineer for his approval before use.

The Contractor shall submit a sieve grading analysis to the Engineer for approval and if unacceptable, the Contractor shall offer another sample and grading for approval, or may blend aggregate from different sources and submit the blend for approval.

The water demand of the fine aggregate shall not exceed 195 l/m<sup>3</sup>.

Fine aggregate shall be stored on a concrete surface and washed sand shall be allowed to drain for at least 24 (twenty-four) hours before use. The Engineer may require the Contractor to test the sand daily (or more frequently if necessary) for moisture content, impurities and grading before use.

**PSG4.2 Coarse Aggregate**

The voids ratio of the coarse aggregate shall not exceed 47 % (forty-seven per cent). Single sized aggregates shall be stored on a concrete surface in separate stock piles, according to size. The proportions of the various single sized aggregates required for the various portions of the work shall be submitted by the Contractor for the Engineer's approval.

**PSG5 CONSTRUCTION**

**PSG5.1 Reinforcement**

The following additional requirements shall be applicable to water retaining structures:

**PSG5.1.1 Fixing (Subclause 5.1.2)**

The use of plastic spacer blocks will not be allowed.

**PSG5.1.2 Cover (Subclause 5.1.3)**

C. C.3.92

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

In water retaining structures the exposure condition of a reinforcing bar closest to the face in direct contact with water or soil backfilling, shall be classified as serere.

It should be noted that in some water retaining structures only one face of the structural elements will be in contact with water.

Concrete cover to reinforcement to be 50 mm throughout.

The soffit of a slab suspended above the water (eg. a reservoir roof) will be treated as being a contact with the water for the purpose of determining the cover.

#### **PSG5.2    Strength concrete (Subclause 5.5.1.7)**

It is a requirement that the Contractor employ the services of an approved specialist to obtain design mixes compatible with the specification. The preferred specialist is CCI who has to confirm in writing that:

- a: The proposed concrete mix was designed by CCI
- b: The proposed concrete mix is suitable for water retaining structures with aggressive water (soft water) being retained.
- c: The proposed concrete mix is of grade 35/19

No concrete shall be placed until the Contractor's concrete mix design has been approved by the Engineer. The Contractor shall submit to the Engineer a statement of the mix proportion proposed, together with a report from an approved testing laboratory, showing the 28 day concrete strength obtained when using the materials proposed for the work.

The strength determinations shall be based on not less than three concrete test specimens.

When the Contractor can furnish reliable test records of concrete of a quality at least equal to that specified, having been made with materials from the same sources and of the same qualities as he proposes to use, the Engineer may waive all or part of the strength tests required in the above paragraph.

C. C.3.93

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

The preparation of the 150 mm test cube specimens and the sampling techniques shall be in accordance with the relevant SANS specification.

Concrete for water retaining structures shall have a free water/cement ratio of less than 0,5 and a cement content of 420 kg/m<sup>3</sup>. Admixtures may be used to increase the workability of the concrete but only with the express approval of the Engineer and when the details of the active ingredients of the admixture and their effects are supplied to the Engineer for approval before use.

No additives likely to impair low permeability of the concrete will be approved. Calcium chloride or admixtures containing chlorides may not be used in concrete for water retaining structures. Other admixtures and constituents may only be used with the approval of, or as specified by the Engineer.

#### **PSG5.3 Placing (Subclause 5.5.5)**

Panels between construction joints shall be cast alternatively.

#### **PSG5.4 Construction Joints (Subclause 5.5.7)**

The following additional requirements shall be applicable to water retaining structures:

The Engineer may allow the Contractor to cut an additional straight construction joint if it is possible without prejudicing the water tightness of the structure. The additional construction joint shall be sealed with the same seal that is specified for planned construction joints at the expense of the Contractor.

Construction joints in reinforced concrete walls, embankments, etc. shall consist only of horizontal joints. If under abnormal conditions a vertical construction joint is unavoidable it may only be constructed with the approval of the Engineer.

Construction joints shall only be placed at intervals shown on the drawings or as directed by the Engineer. The exact position of construction joints shall be marked on the formwork in order to obtain truly horizontal joints.

##### **PSG5.4.1 Preparation of Surface**

C. C.3.94

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*



Prior to placing any further concrete the joint must be clean, damp and free of laitance. During the period when the concrete is still green, all loose material shall be removed, without disturbing the aggregates, by light brushing. Where this is not possible, or if the concrete has already set, the surface film shall be removed by mechanical means appropriate to the degree of hardness of concrete so as to expose the aggregate over the entire surface and leave a sound, irregular surface.

#### **PSG5.4.2 Before Placing Concrete**

Where the concrete of the previous lift is more than 3 days old, it shall be kept continuously wet before the mortar and fresh concrete is placed.

On all construction joints the following steps shall be taken after the surface has been prepared and at the most, 30 minutes before placing the concrete:

Remove all surface water with an air hose and dry sprinkle waterproofing additive (Vandex Premix or similar approved) at 9,8 kg per m<sup>2</sup>.

Place a layer of approximately 10 mm thickness consisting of cement, sand and water mixed in the same proportions as used in the concrete.

Place concrete within 30 minutes.

#### **PSG5.5 Curing and Protection (Subclause 5.5.8)**

SANS 1200 G Clause 5.5.8 will be deleted for the purpose of this Specification and replaced with the following:

“All concrete other than blinding concrete shall be maintained continuously saturated for at least ten days or as directed on the drawings immediately after placement or after stripping formwork in the case of walls, by methods which shall receive the prior written approval of the Engineer if different from the following:

a) For floors

Ponded water with a minimum depth of 30 mm.

b) For Columns and Walls

C. C.3.95

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Continuously saturated heavy jute sacking or other approved absorbent material maintained in contact with the concrete surface by fastenings spaced at not more than 2 m centres.

c) For Floors and Columns

Covering the previously saturated surfaces with approved plastic sheets maintained in contact with the concrete surface and with all edges and joints sealed by methods approved by the Engineer.

Where the ambient temperature is below 4 ° C the curing period of 10 days or as directed on the drawings, will be extended by 72 hours.

Newly cast concrete sections shall not be used for supporting loaded wheelbarrows, monorails, material or scaffolding, etc., until permission is obtained from the Engineer."

## **PSG5.6 Adverse Weather Conditions**

### **PSG5.6.1 Concreting in cold weather**

During cold weather no material having a temperature below 5 ° C shall be used for making concrete.

No concrete shall be placed when the ground or air temperature is below 2° C or if the ground or air temperature is likely to fall below 2° C within 6 (six) hours of placing the concrete.

The temperature of placed concrete shall not be allowed to fall below 5 ° C until the concrete has attained a strength of at least 5 Mpa, and the Contractor shall be responsible for all the necessary protective measures to ensure this. All concrete that has been damaged by frost or by the formation of ice in the concrete shall be removed and replaced by the Contractor at his own expense.

### **PSG5.6.2 Concreting in hot weather**

During hot weather, the temperature of the concrete, as placed, shall not exceed 30°C. The Contractor shall ensure that the placing of the fresh concrete does not exceed the ambient temperature by more than 5°C. Where necessary this shall be accomplished by shading aggregate stockpiles, shading or insulating water pipes and water storage tanks.

C. C.3.96

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

**PSG6 CONCRETE SURFACES (Subclauses 5.2.1 and 5.5.10)**

**PSG6.1 Special Smooth Formwork**

Where special smooth formwork is specified for the exposed surfaces of concrete structures, only new shutter boards or new steel panels without any dents or marks shall be used. The shutter boards or panels shall be arranged in a rectangular pattern approved by the Engineer. Special care shall be taken at construction joints to form a straight and smooth joint. Where specified feature strips shall be used at construction joints, all projections shall be removed, irregularities repaired and the surface rubbed or treated to form a smooth finish with a uniform texture, appearance and colour. The finish of the concrete shall be accurate to a degree of accuracy I as defined in Clause 6.

**PSG6.2 Wood-Floated Finish**

Where wood floating is specified or scheduled, the surface shall first be given a finish as specified in Sub-Clause 5.5.10.1 of SANS 1200 G after the concrete has hardened sufficiently, it shall be floated to a uniform surface free of trowel marks. The screeded surface shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface free from screed marks.

**PSG6.3 Steel-Floated Finish**

Where steel is specified or scheduled, the surface shall be treated as specified in PSG6.2 except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screeded surface shall be steel trowelled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.

**PSG6.4 Power-Floated Finish**

Where power floating is specified or scheduled, the surface shall be treated as specified in PSG6.1 except that the screeded surface shall be power-floated to produce a high quality dense, smooth, uniform surface free from trowel marks.

**PSG7 CONCRETE JOINTS (Subclause 5.5.11)**

**PSG7.1 Construction Joints (Subclause 5.5.7)**

C. C.3.97

*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

Joints in the concrete structure at which special measures are taken to achieve subsequent continuity are termed construction joints. Construction joints will be permitted only where shown on the drawings or approved by the Engineer and shall be formed true to line on all formed or exposed surfaces. Horizontal joints shall be formed by casting against a timber or metal former. Recesses shall be formed as detailed on the drawings. Where detailed on the drawings, galvanized metal strips or waterbars shall be cast into the joints. No unplanned construction joints will be allowed. If a breakdown occurs, the contractor shall strip the shuttering as soon as possible and break out all concrete up to the previous planned construction joint.

Except in the case where movement joints are required, the entire joint contact area of the concrete already placed shall be thoroughly roughened by chipping with sharp chipping picks before placing concrete against the surface. This surface will not be accepted unless the coarse aggregate projects 5 mm beyond the surrounding matrix. In this connection approved light pneumatic or electric tools are preferred provided that no structural damage is done to the concrete being chipped: otherwise hand tools are to be used. Chipping shall not be commenced until at least 48 (forty-eight) hours after the concrete was placed.

Alternative methods of preparing the surfaces of construction joints to those given above will be considered. The Contractor shall submit proposed alternative methods of achieving the roughened surface required to the Engineer for approval.

Should the Engineer at any time withhold or withdraw permission for alternative methods to be used then the Contractor shall prepare the surfaces of construction joints in accordance with the above specification.

Immediately before the adjoining concrete is placed, the chipped surface shall be thoroughly cleaned by brushing and washing and then thoroughly wetted. At the discretion of the Engineer the percentage of coarse aggregate of the mix may be slightly reduced in a layer not exceeding 200 mm in depth immediately above the chipped surface of a horizontal construction joint. Suitable temporary openings shall be left in the shuttering to allow for the removal of sawdust, shavings, nails, debris, etc.

The application of compounds to the surfaces of stop ends at vertical joints to retard the setting of a film of concrete in contact with the stop end will be

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permitted subject to the Engineer's approval of the compound to be utilised and the Contractor's methods for the application of the same.

#### **PSG7.2 Movement Joints**

Movement joints shall be formed where shown on the drawings.

Movement joints shall be formed true to line and shall be thoroughly cleaned of all accretions of concrete or other foreign matter by scraping or other approved means. The surfaces in contact with joint sealing material shall be prepared strictly in accordance with the manufacturer's Specification.

Care shall be taken to ensure that the waterbars are in perfect contact with well compacted void-free concrete throughout, particularly on horizontal joints where special procedures shall be adopted for placing and compacting concrete under the waterbars, to the approval of the Engineer.

#### **PSG8 WATERPROOFING OF CONCRETE JOINTS**

Three different systems of waterproofing (or construction of systems) exist and the appropriate system (or combination) will be applied as specified on the drawings: The three systems are:

Waterproofing with hypalon bandage system

Waterproofing with waterbars

Waterproofing with surface sealants

##### **PSG8.1 Hypalon system**

The bandage shall comprise a 250 mm wide, or as detailed on drawings, 2 mm thick, Sikadur-Combiflex joint sealing system or similar approved. The hypalon bandage shall be applied strictly in accordance with the manufacturer's specifications and requirements.

##### **PSG8.2 Waterbars (Waterbars will not be used on this contract)**

Except where otherwise specified waterbars shall be manufactured from virgin polyvinyl chloride complying with BS 2571: latest amendment (Class 3 compounds) and the Tenderer shall provide full details of the composition and properties of the material in the relevant annexure where applicable.

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Samples of waterbars shall be submitted for approval and all material subsequently supplied shall be identical in size, shape, colour and quality to the approved sample. The waterbar shall be of uniform cross-section and size and shall have lugs welded at 1 m centres on both edges of the waterbar to hold it securely in position during concreting operations.

It shall be possible for all sizes of waterbar to be turned through a 75 mm radius without damage or permanent set to the waterbar.

Joints in waterbars shall be kept to a minimum by the use of the longest possible lengths.

Waterbars shall be held to the required shape, lines, etc, in suitable formwork: site joints shall be bonded as directed by the manufacturer in such a way as to form a continuous watertight seal free from pin holes at any point of the length or width of the strip.

Formwork shall be designed to accommodate the waterbars without subsequent bending and the waterbars shall be adequately supported and protected from damage and sunlight until finally encased in concrete.

Waterbars shall be tested in accordance with BS 2782 and ISO R527.

### **PSG8.3 Waterproofing with surface sealants**

#### **General**

A groove of dimensions specified shall be formed, where indicated, and sealed by an approved sealant. The sealant shall be non-toxic and shall be either a hand applied bitumen putty sealant or a polysulphide sealant. The type of sealant to be specified on the drawings and the product to be used shall be approved by the Engineer.

#### **Bitumen Putty Sealant**

All joints shall be clean, dry and free of laitance. The concrete shall be at least four weeks old. The joint surfaces shall then be primed by an ancillary product and the sealant applied as per the suppliers' specification. Special precautionary measures shall be taken to acquire a neat finish by covering the face edges of

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the joint with masking tape before priming. Any excess material will be cut away and finished flush.

### **Poli-urethane Sealant**

All joints shall be clean, dry and free of laitance. Prime joint face if required – following the suppliers specification. Apply the sealant and finish off flush with the concrete surface.

## **PSG9 MISCELANEOUS**

### **PSG9.1 Porous concrete**

Porous concrete shall be laid under foundations and floor slabs and behind walls, etc, where shown on the drawings and where directed by the Engineer. Porous concrete shall be placed behind shuttering to form a vertical layer against the external face of foundations etc where shown on drawings and where directed by the Engineer. The thickness of the horizontal, sloping and vertical layers shall not be less than that shown on the drawings.

The exposed faces, both horizontal and vertical, of the porous concrete shall be finished with a cement mortar seal where reinforced concrete is to be cast against it. The porous concrete shall be sealed with a 5 mm thick layer of mortar composed of one part normal portland cement to two parts of fine aggregate by mass, trowelled on before the porous concrete has hardened, and finished with a screed to provide a smooth, uniform plane surface without filling any of the internal voids of the porous concrete. The surface of the seal shall have a steel or power float surface.

The schedule rates for porous concrete shall include the cost of mortar seal and steel float finish.

Porous concrete shall comprise water, cement, coarse aggregate and not more than 5 % (five percent) by mass of fine sand. The voids ratio of porous concrete shall not be less than 27,5 % (twenty-seven and one half) percent. Testing of porous concrete shall be carried out in accordance with test method 3 of BS 1881 Part 3 – 1970.

### **PSG9.2 Bond breaker**

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Where indicated on the drawings, site or porous concrete under floor slabs and wall footings etc. shall be covered with a bond breaker consisting of 2 sheets of 250 micron tear resistant damp proof membrane to SANS 952 (1969) C having 150 mm laps and pierced at 1 m intervals to allow the passage of water.

The Generic Labour-intensive specification below is the same as SANS 1921-5, Construction and management requirement for works contracts- Part 5: Earthworks activities which are to be performed by hand and should be included in the scope of works without amendment or modification as set out below.

### SCOPE

This specification establishes general requirements for activities which are to be executed by hand involving the following:

- a) trenches having a depth of less than 1.5 metres
- b) stormwater drainage
- c) low-volume roads and sidewalks

### PRECEDENCE

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

### HAND EXCAVATEABLE MATERIAL

Hand excavateable material is material:

- a) granular materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or
- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

- b) cohesive materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or
- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note:

1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

2) A dynamic cone penetrometer is an instrument used to measure the insitu shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle

of 60° with respect to the horizontal) into the material being used.

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Contractor

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**Table 1: Consistency of materials when profiled**

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	DESCRIPTION	CONSISTENCY	DESCRIPTION
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in upto 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of geological pick; requires many blows for excavation.	Stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

**Trench excavation**

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

**Compaction of backfilling to trenches (areas not subject to traffic)**

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

- a) to 90% Proctor density;
- b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or
- c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

**Excavation**

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

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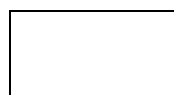
Contractor



Witness 1



Witness 2



Employer



Witness 1



Witness 2

**(d) Drainage of excavations**

The contractor shall apply suitable, effective drainage and dewatering methods for preventing the ingress of water into the excavation and to keep them dry.

Drainage measures, with the exception of pumping, shall be maintained until the backfilling has been completed. Between various construction stages, pumping may be interrupted in consultation with the engineer.

Any draining or pumping of water shall be done in a manner as will preclude the concrete or materials or any part thereof from being carried away.

Allowance for measurement and payment for dewatering and keeping dry of culvert excavations is made in the schedule in this section”.

**END OF SECTION**

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*Contractor*

*Witness 1*

*Witness 2*

*Employer*

*Witness 1*

*Witness 2*

**PROJECT SPECIFICATIONS: ADDITIONAL SPECIFICATIONS**

**C3.6.2 HEALTH AND SAFETY SPECIFICATION**

**C3.6.3 ENVIRONMENTAL MANAGEMENT PLAN**

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## **C3.6.2 HEALTH AND SAFETY SPECIFICATION**

### **CONTENTS**

C3.6.2.1	SCOPE
C3.6.2.2	INTERPRETATIONS
C3.6.2.3	GENERAL REQUIREMENTS OF HEALTH AND SAFETY PLAN
C3.6.2.4	RISK ASSESMENT
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C3.6.2.9	AUDITING
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### **ANNEXURES**

#### **ANNEXURE 1 APPOINTMENTS LETTERS**

- ANNEXURE 1.1: Appointment of Assistant Construction Supervisor
- ANNEXURE 1.2: Appointment of Construction Site Health and Safety Officer
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- ANNEXURE 1.4: Appointment of Subcontractor
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- ANNEXURE 1.8: Appointment of Ladder Inspector
- ANNEXURE 1.9: Appointment of Risk Assessor
- ANNEXURE 1.10: Appointment of Scaffolding Supervisor
- ANNEXURE 1.10: Appointment of Stacking Supervisor

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## ANNEXURE 2 NOTIFICATION TEMPLATES

### ANNEXURE 2.1:Notification for Construction Work

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*Contractor*



*Witness 1*



*Witness 2*



*Employer*



*Witness 1*



*Witness 2*

## **PAP- HEALTH AND SAFETY SPECIFICATION**

### **C3.6.2.1 SCOPE**

#### **1.1 Scope of Specification**

This specification covers the principles, duties, responsibilities, liabilities, and requirements applicable in respect of health and safety in the work place on construction work.

This document constitutes the Employers' Health and Safety Specification as defined in the Construction Regulations, 2003 of the Occupational Health and Safety Act (Act 85 of 1993).

This specification applies to tunneling although the minimum requirements for tunneling are contained in the Mines Health and Safety Act. This specification however does not apply to underground construction at this point in time as covered by the Mines Health and Safety Act, 1996 (Act 29 of 1996) as amended.

#### **1.2 Philosophy**

Some of the terms and requirements of the Occupational Health and Safety Act and its Regulations may be novel to Contractors. This specification has therefore been prepared as an instructive guideline without being prescriptive, constraining the competitive advantage or interfering with the legal obligations of the responding parties.

The Health and Safety Plan required in terms of this specification may also be novel to Contractors. This specification has therefore been prepared in such a way to allow Contractors to employ the services of specialist consultants for the preparation and implementation of the same during the construction of the Works.

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Employer

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Health and safety can only be assured on construction works if all stakeholders buy into the Health and Safety plan and when the health and safety of all is an integrated line accountability of all management staff and workers on site. The management systems that are provided for in this specification is to enable the performance statistics of health and safety to be regularly captured, the intention of these systems is not to achieve health and safety by policing the conduct of the Contractor's employees.

In addition to ensuring health and safety, the intention of the management system is rather to commercially exploit the benefit of doing things right the first time that goes hand in hand with top health and safety performance. Accidents and injuries never pay. The loss of production and the cost of injuries, however, relatively infrequent they may be, far outweigh the effort required to maintain top health and safety on construction.

The specification accordingly provides for:

- a) Independent periodic audits to ensure an unbiased pursuit of health and safety,
- b) Follow-up audits to ensure the implementation of prescribed remedial actions,
- c) The review of the efficiency and effectiveness of the Contractor's Health and Safety Plan,
- d) The preparation of regular reports of inspections and accidents to enable the tracking of changes in health and safety performance,
- e) The monitoring of conditions on a continuously pro-active basis to ensure that hazards are without delay identified, assessed and remedied should it threaten the health and safety of persons and property,
- f) Ad hoc inspections to ensure that health and safety is pursued with dedication and not out of intimidation or coercion, and
- g) Development of all aspects of the Contractor's Health and Safety Plan.

The fundamental intention of this specification is that the preservation of health and safety will become a core value of all involved during the construction of the Works.

This Specification does not require the preparation of an unduly extensive or complex risk assessment. The Contractor should rather prepare a risk assessment which takes the size of the project, the size of the Contractor's

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organization, the conditions of the workplace and the nature, complexity and significance of the hazards likely to be encountered during the execution of the Works into account.

### **C3.6.2.2 INTERPRETATIONS**

#### **2.1 Supporting specifications**

Where this specification is required for a project, the following specifications (as amended) shall, inter alia, form part of the contract document:

a) Occupational Health and Safety Act, 1993, and its regulations which shall include, but shall not be limited to the following:

- Construction Regulations, 2003,
- General Safety Regulations,
- General Administrative Regulations, 1996,
- Driven Machinery Regulations, 1988,
- Electrical Installation Regulations, 1992,
- Electrical Machinery Regulations, 1988,
- Environmental Regulations for Workplaces, 1987, and
- Facilities Regulations, 1990.

b) Clauses 6. (5) b, 6.(6), 6.(7) and 6.(8) of the Special Conditions of Contract.

c) The applicable SANS 1200 specifications as listed in Section 4.1 of this Contract Document.

#### **2.2 Application**

This specification contains clauses that are applicable to the occupational health and safety requirements of the Occupational Health and Safety Act, 1993 and its Regulations, in particular the Construction Regulations, 2003 promulgated on 18 July 2003 in terms of Section 43 of the Act.

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## 2.3 Definitions

In the Contract (as defined in clause 1.(1)(e) of the Conditions of Contract) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

- (a) “Assistant Construction Supervisor” means a competent person appointed in accordance with regulation 6.(2) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (b) “Batch Plant Supervisor” means a competent person appointed in accordance with regulation 18.(1) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (c) “Construction Health and Safety Officer” means a competent person appointed in accordance with regulation 6.(6) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (d) “Construction Supervisor” means a competent person appointed on a full-time basis in accordance with regulation 6.(1) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (e) “Construction Vehicles & Mobile Plant Inspector” means a competent person appointed in accordance with regulation 21.(1)(j) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (f) “Contractor” means the natural or juristic person or partnership whose tender has been accepted by or on behalf of the Employer and, who is defined as the Principal Contractor in the Construction Regulations, 2003.
- (g) “Demolition Work Supervisor” means a competent person appointed in accordance with regulation 12.(1) of the Construction Regulations, 2003, in writing by the Contractor with written notification to the Engineer.
- (h) “Employer’s Designer” means the natural or juristic person or partnership named in the Appendix to Tender or any other natural or juristic person or

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partnership appointed from time to time by the Employer for the design of the portion of the Permanent Works which the Employer is responsible to design in terms of this Contract.

- (i) “Contractor’s Designer” means the natural or juristic person or partnership appointed from time to time by the Contractor and notified in writing to the Engineer and Employer for the design of the portion of the Permanent Works which the Contractor is responsible to design in terms of this Contract, and for the design of the Temporary Works.
- (j) “Electrical Temporary Installation Inspector” means a competent person appointed in accordance with regulation 22. (d) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (k) “Employer” means the natural or juristic person or partnership for whom the Works are to be executed, who is named as the Employer in the Conditions of Contract and who is known as the “Client”, in the Occupational Health and Safety Act, 1993 and its regulations.
- (l) “Engineer” means the natural or juristic person or partnership named as the Engineer in the Conditions of Contract and appointed by the Employer to act as the Engineer in terms of this Contract.
- (m) “Engineer’s Representative” means the person appointed by the Engineer in terms of Clause 2 of the Conditions of Contract.
- (n) “Excavation Work Supervisor” means a competent person appointed in accordance with regulation 11. (1) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (o) “Explosive Powered Tools Issuer” means a competent person appointed in accordance with regulation 19. (2)(g)(i) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (p) “Fall Protection Developer” means a competent person appointed in accordance with regulation 8. (1)(a) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (q) “Fire Extinguisher Inspector” means a competent person appointed in accordance with regulation 27. (h) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (r) “Formwork and Support Work Supervisor” means a competent person appointed in accordance with regulation 15.(1) of the Construction

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Employer

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Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.

- (s) “Hazard” means any object, action or condition that can potentially harm the health and safety of persons or property.
- (t) “Hazard Identification” means the identification and documenting of existing or expected hazards.
- (u) “Health and Safety Consultant” means the natural or juristic person or partnership appointed by the Contractor to assist in any matters related to health and safety on the construction site.
- (v) “Health and Safety Plan” means a documented plan, prepared by the Contractor, of work procedures to mitigate, reduce or control hazards identified.
- (w) “Health and Safety Specification” means a documented specification of all health and safety requirements and criteria to mitigate reduce or control hazards identified.
- (x) “Health and Safety Representative” means the person/s designated in accordance with section 17 of the Occupational Health and Safety Act.
- (y) “Ladder Inspector” means a competent person appointed in accordance with regulation 13 of the General Safety Regulations, in writing by the Contractor, with written notification to the Engineer.
- (z) “Material Hoist Inspector” means a competent person appointed in accordance with regulation 17.(8)(a) of the Construction Regulations, 2003 in writing by the Contractor, with written notification to the Engineer.
- (aa) “Method Statement” means a document detailing the key activities to mitigate, reduce or control hazards identified.
- (bb) “Professional Engineer” means any person employed from time to time by either the Employer or Contractor who holds registration as either a Professional Engineer or Professional Certificated Engineer under the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- (cc) “Professional Technologist” means any person employed from time to time by either the Employer or Contractor who holds registration as a Professional Technologist under the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- (dd) “Risk” means the likely occurrence and impact of a hazard.

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Employer

Witness 1

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- (ee) “Risk Assessment” means a programme carried out to identify and evaluate the likely occurrence and impact of all hazards.
- (ff) “Risk Assessor” means a competent person appointed in accordance with regulation 7.(1) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (gg) “Safety Agent” means a competent natural or juristic person or partnership named in the Appendix to Tender or any other person appointed from time to time by the Employer and notified in writing to the Contractor to act on behalf of the Employer for the purposes of this specification.
- (hh) “Scaffolding Supervisor” means a competent person appointed in accordance with regulation 14. (2) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (ii) “Stacking Supervisor” means a competent person appointed in accordance with regulation 26. (a) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.
- (jj) “Subcontractor” means the natural or juristic person or partnership who is appointed by the Contractor with prior consent of the Engineer to execute certain tasks associated with the Works and who is also an employer as defined in section 1 of the Occupational Health and Safety Act.
- (kk) “Suspended Platforms Supervisor” means a competent person appointed in accordance with regulation 15.(1) of the Construction Regulations, 2003, in writing by the Contractor, with written notification to the Engineer.

## **2.4 Duties, responsibilities and liabilities**

### **2.4.1 Principal Parties**

This section covers the duties, responsibilities and liabilities of the following principal parties:

- Employer
- Employer’s Safety Agent
- Contractor
- Subcontractor
- Employer’s Designer

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Employer

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• Contractor's Designer

The duties and responsibilities of the various principal parties are briefly summarized below (the numbers indicated correspond to the applicable regulation number in the Construction Regulations, 2003). The intention of the summary is not to replace the Regulations, but is included for indicative purposes. The liabilities of each party are also shown.

a) Employer

In addition to the duties, responsibilities and liabilities specified in the Conditions of Contract, the Employer shall have the following duties and responsibilities to ensure compliance with the Construction Regulations, 2003:

- 4.(1)(a) Prepare health and safety specifications for the Works.
- 4.(1)(a) Provide copies of the specifications to Tenderers or to the appointed Contractor.
- 4.(1)(b) Provide any information to the Contractor that may affect the health and safety of his employees.
- 4.(1)(c) Appoint the Contractor in writing for the Works.
- 4.(1)(d) Take reasonable steps to ensure that the Contractor's Health and Safety Plan is implemented and maintained on the Works (which shall include monthly audits).
- 4.(1)(e) Stop the Contractor from executing work, not in accordance with, his Health and Safety Plan or which poses a threat to the health and safety of persons.
- 4.(1)(f) Ensure that sufficient health and safety information and appropriate resources are made available to the Contractor when changes are brought about to the design.
- 4.(1)(g) Ensure that the Contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works.
- 4.(1)(h) Ensure that Tenderers have made provision in their tenders for the cost of health and safety measures during the construction of the Works.

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Contractor

Witness 1

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Employer

Witness 1

Witness 2

- 4.(2) Discuss and negotiate the contents of the Contractor's Health and Safety Plan.
- 4.(2) Approve the Contractor's Health and Safety Plan for implementation.
- 4.(3) On request, make available copies of the Contractor's Health and Safety Plan to his employees, his Subcontractors and inspectors.
- 4.(4) Satisfy himself on the competencies and resources of the Contractor he intends appointing.
- 4.(6) Satisfy himself on the competencies and resources of his Safety Agent should he decide to appoint one.

In terms of Clause 6.(6) of the Special Conditions of Contract, the Contractor accepts sole liability as mandatory for due compliance with the Occupational Health and Safety Act, 1993 and all its regulations including the Construction Regulations, 2003. The Employer will only be responsible for the duties imposed on the Employer in terms of the Construction Regulations, 2003 as listed above.

b) Employer's Safety Agent

Where the Employer decides to appoint an agent in accordance with regulation 4.(5) of the Construction Regulations, 2003, the duties and responsibilities as imposed by these regulations upon the Employer shall as far as reasonably practicable apply to his Safety Agent.

c) Contractor

In addition to the duties, responsibilities and liabilities specified in the Conditions of Contract, the Contractor shall have the following duties and responsibilities to ensure compliance with the Construction Regulations, 2003:

- 3.(1)(a) Notify the provincial director in writing of the commencement of the construction works.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

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- 3.(3) Ensure that a copy of the notification letter is kept on site for inspection on request as well as proof of its receipt by the Department of Labour.
- 5.(1) Demonstrate a Health and Safety Plan, based on the Employer's health and safety specifications.
- 5.(1) Apply the Health and Safety Plan from the Commencement Date until completion of the Works.
- 5.(2) Ensure co-operation between all contractors to enable each to comply with the provisions of Construction Regulations.
- 5.(3)(a) Provide any Tenderer or Subcontractor with copies of the Employer's health and safety specifications.
- 5.(3)(b) Appoint Subcontractors in writing.
- 5.(3)(c) Ensure that each Subcontractor's Health and Safety Management Plan is implemented and maintained on their portion of the Works.
- 5.(3)(d) Stop any Subcontractor from executing Works, not in accordance with, the Contractor's Health and Safety Plan or which poses a threat to the health and safety of persons.
- 5.(3)(e) Ensure that sufficient health and safety information and appropriate resources are made available where applicable, to the Subcontractor when changes are brought about to the design of the Works.
- 5.(3)(f) Ensure that his Subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works.
- 5.(3)(g) Ensure that his Tenderers have made provision in their tenders for the cost of health and safety measures during the construction of the Works in line with the requirements of the Employers Health and Safety Specification and his Health and Safety Management Plan.
- 5.(5) Discuss and negotiate the contents of his Subcontractor's Health and Safety Plan, to ensure compliance with the Employer's Health and Safety Specification and consistent with the Contractors Health and Safety Management Plan.
- 5.(5) Approve his Subcontractor's Health and Safety Plan for implementation and to keep records of all such approvals on site for auditing purposes.

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Employer

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- 5.(6) On request, make available a copy of his and his Subcontractor's Health and Safety Plan to an employee, inspector, contractor, the Employer or the Employer's Safety Agent.
- 5.(7) Open and maintain a record management system regarding health and safety for the Contractors own and Subcontractors' Health and Safety Documentation on the construction site.
- 5.(7) Upon request, make available his health and safety record management system to an inspector, Employer, the Employer's Safety Agent or the Contractor.
- 5.(8) Deliver the health and safety record management system to the Employer upon completion of the Works.
- 5.(9) Ensure that a comprehensive and updated list of all his Subcontractors (including their respective subcontracting agreements) are included in the health and safety record management system.
- 5.(10) Satisfy himself on the competencies and resources of the Subcontractor he intends appointing.
- 6.(1) Appoint a construction supervisor.
- 6.(3) Appoint assistant construction supervisors if required by an inspector.
- 6.(5) Appoint individual construction supervisors for individual construction sites.
- 6.(6) The Contractor shall after due consideration of the complexity, size and potential hazards and associated risks as well as controls towards the mitigation of risks, appoint a safety officer in writing. The contractor shall submit a detailed CV of the envisaged Safety Officer appointment for final acceptance thereof by the Employer or his Safety Agent.
- 6.(7) Provide opportunities to the construction safety officer to provide inputs into the Health and Safety Plan.
- 6.(8) Satisfy himself with the competencies and resources of the construction safety officer he intends appointing.
- 7.(1) Perform a risk assessment prior to the commencement of any construction work.
- 7.(2) On request, make available copies of the his/her risk assessment.

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- 7.(3) Consult with the health and safety committee on the development, monitoring and review of the risk assessment.
- 7.(4) Ensure that all employees are informed, instructed and trained regarding any hazard and the related work procedures before any work commences. The contractor shall ensure that proof of such is available on site for auditing purposes.
- 7.(5) Ensure that all Subcontractors are informed regarding any hazard as stipulated in the risk assessment. Further that Subcontractors conduct their own risk assessments as and when required
- 7.(6) Analyze ergonomic related hazards and address the same in the risk assessment.
- 7.(7) Ensure that all employees undergo health and safety induction prior to permitting each employee access to the Works. The Contractor shall ensure that proof of such is available on site for auditing purposes.
- 7.(8) Ensure that all visitors undergo health and safety induction and are provided with the necessary personal protective equipment. The Contractor shall ensure that proof of such is available on site for auditing purposes.
- 7.(9) Ensure that every employee is in possession and carries at all times his proof of health and safety induction training.
- 9.(1)(a) Prevent the uncontrolled collapse of any structure which may become unstable due to the carrying out of construction work.
- 9.(1)(b) Ensure that no structure is loaded in an unsafe manner.
- 9.(3) Ensure that all construction drawings are on site and available on request by an inspector, contractors, Employer, the Employer's Safety Agent or employee.

In terms of Clause 6.(6) of the Special Conditions of Contract, it shall be deemed that the parties to this Contract have agreed in writing in terms of Section 37(2) of the Occupational Health and Safety Act, 1993 that the Contractor accepts sole liability for due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures imposed by the Occupational Health and Safety Act, 1993 and all its regulations, including the Constructions Regulations, 2003, for which he is liable as mandatory.

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d) Subcontractor

To ensure compliance with the Construction Regulations, the Subcontractor shall:

- 5.(4) Demonstrate a Health and Safety Plan, based on the Employer's health and safety specification.
- 5.(4) Apply his Health and Safety Plan from the Commencement Date and until completion of the Works.
- 5.(12) Satisfy himself on the competencies and resources of any Subcontractor he intends appointing.
- 5.(14) Provide the Contractor with any information which might affect the health and safety of any person or which might justify a review of the Health and Safety Plan.

In addition to the above items, the Subcontractor shall, to ensure compliance with the Construction Regulations, comply with regulations 5.7, 6.(1), 6.(3), 6.(5), 6.(6), 6.(7), 6.(8), 7.(1), 7.(2), 7.(3), 7.(4), 7.(6), 7.(7), 7.(8), 7.(9), 9.(1)(a), 9.(1)(b) and 9.(3), summarized in Section 2.4.1(c) above.

e) Designer (Employer's Designer or Contractor's Designer)

To ensure compliance with the Construction Regulations, 2003, the Designer (as defined in the Construction Regulations, 2003) shall:

- 9.(2) Make available to the Employer all relevant information affecting the pricing of the Works.
- 9.(b) Inform the Contractor of any hazards relating to the Works.
- 9.2(b) Make available all information required for the safe execution of the Works.

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- 9.2(c) Ensure that information relating to geo-sciences, designs loads, and the methods and sequencing of construction processes are made available to the Contractor in a report.
- 9.2(d) Not include dangerous procedures or hazardous materials in the structure's design which could be avoided.
- 9.2(e) Make provision in the design of the Works for hazards likely to be encountered during its subsequent maintenance.
- 9.2(f) Carry out inspections of the construction work during the construction period to ensure compliance with the designs.
- 9.2(f) Keep records of the inspections carried out on the construction site.
- 9.2(g) Stop any contractor from executing works not in accordance with the designs.
- 9.2(h) Conduct a final inspection of the completed Works prior to its commissioning.
- 9.2(h) Issue a completion certificate to the Contractor subsequent to a successful final inspection.
- 9.2(i) Ensure that cognizance is taken of ergonomic design principles in order to minimize related hazards.

The Employer's Designer shall only accept responsibility to comply with the Construction Regulations, 2003 for that portion of the Permanent Works which the Employer is responsible to design in terms of the Contract.

The Contractor's Designer shall accept sole responsibility and liability to comply with the Construction Regulations, 2003 for that portion of the Permanent Works for which the Contractor is responsible to design in terms of the Contract as well as the design of the Temporary Works.

#### 2.4.2

##### *Secondary Parties*

This section covers the duties, responsibilities and liabilities of the following secondary parties:

- Construction Health and Safety Officer
- Contractor's Employees

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- Fall Protection Developer
- Health and Safety Consultant
- Health and Safety Representative
- Risk Assessor

a) Construction Health and Safety Officer

The Construction Health and Safety Officer will act as Health and Safety advisor to the site management staff, ensuring the integrity of the Safety management System and Plan and its implementation. The Construction Health and Safety Officer can therefore never take over the line management responsibilities for safe work practices.

The Contractor is responsible for the development of the position outcomes descriptors for the Construction Health and Safety Officer. This documentation shall be available on site for auditing purposes.

The Construction Health and Safety Officer shall if given an opportunity, provide an input into the Contractor's Health and Safety Plan.

b) Contractor's Employees

All employees will be responsible for safety on the construction site and the work place as prescribed in section 14 of the Occupational Health and Safety Act, 1993 and briefly summarized as follows:

- Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts,
- Co-operate with his employer with regards to health and safety to ensure that his employer complies with requirements imposed on him,
- Obey the health and safety rules and procedures laid down by his employer,
- Report any unsafe or unhealthy situation to his employer or to the health and safety representative for his workplace,

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- Immediately report any incident in which he was involved which has caused an injury to himself or others, and
- Assist in inquiries and incident investigations.

No employee shall intentionally or recklessly interfere with, damage or misuse anything which is in the interest of health and safety

c) Fall Protection Developer

The Fall Protection Developer will be responsible for the preparation and maintenance of a fall protection plan to be implemented by the Contractor, in such a manner to ensure compliance with regulation 8 of the Construction Regulations, 2003.

d) Health and Safety Consultant

The Health and Safety Consultant shall assist the Contractor in any health and safety matters on the Works for which he is appointed.

e) Health and Safety Representative

The Health and Safety Representative shall fulfill the duties as set out in section 18 of the Occupational Health and Safety Act, (Act 85 of 1993). A health and safety representative shall not incur any civil liability by reason of the fact only that he failed to do anything which he may do or is required to do in terms of the Act.

f) Risk Assessor

The Risk Assessor shall facilitate the risk assessment process of the Contractor or Subcontractor. The Risk Assessor shall be responsible for the compilation and implementation of a management plan towards the continuous mitigation of identified risks to as low as is reasonable practicable.

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### 2.4.3 Supervisors, Inspectors and Issuers

This section covers the duties, responsibilities and liabilities of the following Supervisors, Inspectors and Issuers likely to be found on the Works:

a) Batch Plant Supervisor

The Batch Plant Supervisor shall be required to ensure compliance with regulation 18 of the Construction Regulations, 2003. In addition, he shall fulfill the following duties and responsibilities:

- Manage the day to day operation of a batch plant,
- Be responsible for the maintenance of the batch plant,
- Be able to identify developing defects and hazardous situations,
- Act as the Occupational Health and Safety Representative at the batch plant, and
- Take responsibility for the safety of the personnel at the batch Plant.

The Batch Plant Supervisor will have the authority to stop operation of the plant should any hazardous situation require it.

b) Construction Supervisor

The Construction Supervisor shall be responsible for supervising the construction work inclusive of the implementation and maintenance of safe work practices.

c) Construction Vehicle & Mobile Plant Inspector

The Construction Vehicle and Mobile Plant Inspector will ensure the safety of all construction vehicles and plant in such a manner to ensure compliance with regulation 21 of the Construction Regulations, 2003. The inspector will also be responsible for the regular inspection of all vehicles and plant and the recording of his findings. The Contractor shall ensure that proof of such is available on site for auditing purposes.

d) Demolition Work Supervisor

The Demolition Work Supervisor will supervise and control all demolition work on the Works in such a matter to ensure compliance with regulation 12 of the Construction Regulations, 2003. The supervisor will be responsible for all administration related to the demolition works. The Contractor shall ensure that proof of such is available on site for auditing purposes.

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e) Electrical Temporary Installation Inspector

The Electrical Temporary Installation Inspector will control all temporary electrical installations on the Works to ensure compliance with regulation 22 of the Construction Regulations, 2003, the Electrical Installations Regulations, 1992 and SANS 0142. The Contractor shall ensure that proof of such is available on site for auditing purposes.

f) Excavation Work Supervisor

The Excavation Work Supervisor will supervise all excavation work on the Works in such a manner to ensure compliance with regulation 11 of the Construction Regulations, 2003 and shall in particular ensure that every excavation is inspected:

- On a daily basis before each shift,
- After every blasting operation,
- After an unexpected fall of ground,
- After substantial damage to supports, and
- After rains.

The Contractor shall ensure that proof of such is available on site for auditing purposes.

g) Explosive Power Tools Issuer

The Explosives Power Tools issuer will control the issuing and collection of explosive tools, cartridges and nails or studs to ensure compliance with regulation 19 of the Construction Regulations, 2003. The Contractor shall ensure that proof of such is available on site for auditing purposes.

h) Fire Extinguisher Inspector

The Fire Extinguisher Inspector will be responsible for the operation and inspection of all firefighting equipment on the Works to ensure compliance with regulation 27 of the Construction Regulations, 2003. The Contractor shall ensure that proof of such is available on site for auditing purposes.

i) Formwork and Support Work Supervisor

The Formwork and Support Work Supervisor will supervise all formwork and support work operations and will see to it that formwork and support work erectors, operators and inspectors are competent to carry out their work on the Works to ensure compliance with regulation 10 of the Construction

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Regulations, 2003. The Contractor shall ensure that proof of such is available on site for auditing purposes.

j) Ladder Inspector

The Ladder Inspector will be responsible for the regular inspection and recording of his/her findings of all ladders on the Works and to ensure compliance with regulation 13 of the General Safety Regulations. The Contractor shall ensure that proof of such is available on site for auditing purposes.

k) Material Hoist Inspector

The Material Hoist Inspector will be responsible for the daily inspection of material hoists or similar machinery and to ensure Works to ensure compliance with regulation 17 of the Construction Regulations, 2003. The inspector must have experience pertaining to the erection and maintenance of all hoists on the Works. The inspector must be able to determine the serviceability of the entire material hoist including guides, ropes and their connections, drums, sheaves or pulleys and all safety devices. The Contractor shall ensure that proof of such is available on site for auditing purposes.

l) Scaffolding Supervisor

The Scaffold Supervisor will be required to supervise all scaffolding work operations carried out on the Works and to ensure compliance with regulation 14 of the Construction Regulations, 2003 as well as ensure compliance with applicable SANS 085 specifications. The Contractor shall ensure that proof of such is available on site for auditing purposes.

m) Stacking Supervisor

The Stacking Supervisor shall supervise the stacking and storage of all articles on site and shall be responsible to ensure compliance with regulation 26 of the Construction Regulations, 2003.

n) Suspended Platform Supervisor

The Suspended Platform Supervisor will supervise all suspended platform work operations carried out on the Works and to ensure compliance with regulation 15 of the Construction Regulations, 2003. The supervisor will also see to it that all suspended platform erectors, operators and inspectors are competent to carry out their work. The Contractor shall ensure that proof of such is available on site for auditing purposes.

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### C3.6.2.3

## GENERAL REQUIREMENTS OF HEALTH AND SAFETY PLAN

### 3.1

#### General

It will be expected from the Contractor to include in his safety plan method statements on how to accomplish the requirements relating to the Construction Regulations, 2003 and related incorporated standards and regulations.

Contractors should describe how their safety management systems will work and what control procedures they plan on using to ensure safety on the construction site

The following generic aspects should be covered in their safety plan

- What administrative procedures the Contractor envisages to use in the implementation and maintenance of the safety plan with reference to the construction site
- How continuous assessment of the safety plan will be assessed and implemented with respect to construction site
- What control systems the Contractor envisages to implement on site to support his safety program
- How the Contractor will ensure that he adheres to the construction regulations in respect of competent persons for appointments
- What external resources the Contractor envisages on using to ensure successful implementation and sustainability of the safety plan
- What training to employees the Contractor envisages and how he would go about to execute it
- The Contractor should indicate which competent persons he plans on employing

During the tendering phase it will be expected from the tenderer to briefly explain how the abovementioned will be accomplished.

Once a successful tenderer has been appointed, the Contractor shall supply a detailed Health and Safety Plan for review by the Employer, prior to site mobilization, to ensure compliance with the Construction Regulations, 2003. Mobilization shall be dependent upon the acceptance of the Contractor's Health and Safety Management Plan by the Employer. The Contractor's Health and Safety Plan should include, but not be limited to, those sections indicated in Section 3.2 of this specification.

### 3.2

#### Outline of Health and Safety Plan

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The Contractor's Health and Safety Plan prepared in accordance with this specification shall consist of at least the following sections and sub-sections:

1. Aim and Scope of Plan,
2. Risk Assessment,
  - a. Alternative Forms of Risk Assessment,
  - b. Methodology of Risk Assessment,
  - c. Elements of Risk Assessment,
    - i. Scope of assessment,
    - ii. Risks Identified,
    - iii. Risk Analysis,
    - iv. Risk Evaluation,
    - v. Risk Treatment,
    - vi. Monitoring and reviewing,
3. Resources,
  - a. Health and Safety Staffing Organogram,
  - b. Supervisors, Inspectors and Issuers,
  - c. Employees,
  - d. Subcontractors inclusive of their scope of work and their core resources,
  - e. Training,
  - f. Plant,
  - g. Vehicles,
  - h. Equipment
4. Materials,
  - a. Temporary Materials
  - b. Permanent Materials
5. Categories of Work
6. Implementation of Health and Safety Plan,
  - a. Administrative systems,
  - b. Training,
  - c. Reporting,
  - d. Monitoring,
  - e. Inspections,
7. Auditing,
  - a. Internal audits,
  - b. Follow-up audits,
8. Financial Aspects,
9. Emergency procedures and response

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#### **C3.6.2.4 RISK ASSESSMENT**

##### **4.1 General**

This section of the specification provides guidelines for the Contractor in preparation of risk assessments in order to ensure compliance with Regulation 7 of the Construction Regulations, 2003. This section highlights the principles related to the preparation of suitable and sufficient risk assessments. Contractor Staff intending to prepare risk assessments should be trained and suitably experienced in the application envisaged.

A suitable and sufficient risk assessment is an assessment which:

- Accounts for risks that are likely to arise during the construction of the Works,
- Enables the development and implementation of systems to manage the risks,
- Remains valid for a reasonable period of time,
- Provides a basis for training of employees, and
- Improves working procedures and introduce long term controls.

The requirements of the Construction Regulations will not be satisfied by a single risk assessment exercise that holds good for all time. The risk assessment process on the Works is an ongoing process.

The objectives of risk assessments are to:

- Identify the risks that are mostly in need of reduction,
- Identify the various options for achieving such reduction,
- Identify the risks that require careful ongoing management, and
- Identify the nature of the required ongoing attention.

##### **4.2 Forms of Risk Assessment**

In order to ensure compliance with the Construction Regulations, the Contractor will be required to carry out the following three forms of risk assessment:

###### **4.2.1 Baseline or datum risk assessments**

The Contractor will be required carry out a risk assessment before the commencement of construction activities on the Works. This “baseline” or “datum” risk assessment will form part of the Contractor’s Health and Safety Plan. The risks and hazards to which persons, plant, vehicles and facilities may be exposed during the construction of the Works should be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of

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the measures defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

#### 4.2.2 Issue based risk assessments

The Contractor will be required to carry out separate risk assessments during construction of the Works when methods and procedures are varied, for example when:

- Designs are amended,
- New machines are introduced,
- Plant is periodically cleaned and maintained,
- Plant is started-up or shut-down,
- Systems of work change or operations alter,
- Incidents or near-misses occur, or
- Technological developments invalidate prior risk assessments.

#### 4.2.3 Continuous risk assessments

The Occupational Health and Safety Act specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk free environment on an ongoing basis. This is achieved by continuous risk assessments, the most important form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Regular audits,
- Maintaining general hazard awareness,
- Pre-work risk assessment

### 4.3 Methodology for the Preparation of Risk Assessments

The Contractor shall in the preparation of his risk assessments, follow the following general principles:

- Employ a team of suitably qualified individuals with appropriately varied and relevant experience in risk assessment,
- The appointed risk assessor shall lead the risk assessment,
- Provide the team with background data, scope of work, potential hazards and underlying causes, and

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- Where necessary employ experts for complex risk assessments and aspects of risk assessments that require experiential judgment,
- Institute an ongoing system of identifying aspects of the work that require risk assessment, and
- Conduct risk assessments in workshops of the team or by individual members of the team under guidance of the leader as appropriate to the situation.

#### **4.4 Elements of a Risk Assessment**

##### **4.4.1 General**

The process of carrying out a risk assessment consists of a number of well-defined steps. These steps improve decision-making by providing a greater understanding of the risks and their impacts. The main steps or elements of the risk assessment process are as follows:

- 1) Consider scope and nature of risks involved, determine purpose and physical and legal bounds of assessment and define risk evaluating criteria,
- 2) Systematically identify risks,
- 3) Analyze risks with regard to causes, likelihood of occurrence and possible consequences against the background of existing controls and its effectiveness,
- 4) Evaluate risks in terms of pre-established criteria to determine need and priority for attention,
- 5) Treat risks through a process of risk elimination, substitution, controlling risk at source, risk mitigation such as training and as far as risk remains, provide personal protective equipment (PPE),
- 6) Monitor and review progress and performance in terms of management system, and
- 7) Communicate and consult.

The following sections 4.4.2 to 4.4.7 deal with items (2) to (7) above. These items form the continuing process of the risk assessment as indicated in Figure 1, below.

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- vii) Highlight those groups and individuals who may particularly be at risk, and
- viii) Review the adequacy and effectiveness of existing safety controls and measures

#### 4.4.3 Risk Analysis

In this step, the Contractor will be required to analyze the risks identified by determining each risks frequency and magnitude or severity of the consequence of the risk or hazard.

The frequency of occurrence of a hazard may be expressed as the number of times that it may occur in a year, decade, lifetime, century, or longer period, according to comparative human experience. The magnitude of the likely consequence of a hazard may be expressed in terms of the degree of incapacitation, number of people or costs involved. The frequency of occurrence of a hazard and the magnitude of its consequence may be compounded as the risk that it poses as shown in the “risk matrix” in Figure 2

Frequency of Occurrence of Hazard	Severity of Consequences of Potential Hazard					
	1 Medically treatable injury	1 Compensable injury	10 Compensable injuries	1 Permanently disabling injury	1 Fatality	10 Fatalities
Frequent; 1 or more occurrences per year	Medium	High	Very high	Severe	Severe	Severe
Several times during a career; 0.1 occurrences per year	Medium-low	Medium	High	Very high	Severe	Severe
Unlikely, but possible during a career; 0.01 occurrences per year	Low	Medium-low	Medium	High	Very high	Severe
Very unlikely during a career; 0.001 occurrences per year	Low	Low	Medium-low	Medium	High	Very high
Barely credible; 0.0001 occurrences per year	Low	Low	Low	Medium-low	Medium	High

**Figure 2: Compounded Risk Matrix**  
below.

The columns in the table represent the likely consequence of the hazard and the rows, the frequency of occurrence. The scales for both quantities represent consistent progressions and qualitative. The risks evidently range from low to severe. Note that diagonals in the matrix represent the risks of the identified hazards, taking the effectiveness of controls into consideration.

The table represents a typical risk matrix that need not necessarily be adopted by the Contractor. The Contractor may use an alternative risk matrix provided that it is approved as part of his Health and Safety Plan.

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#### 4.4.4 Risk Evaluation

In this step the Contractor will be required to compare the assessed risk with similar risks previously experienced for the purpose of deciding how to treat the risk. A useful systematic approach for this purpose is as follows:

- If the assessed risk exceeds similar risks that have occurred in the past and that are considered to be unacceptable, the assessed risk would require treatment depending upon its magnitude as discussed in Section 4.4.5, or
- If the assessed risk exceeds similar historical risks that are acceptable, treatment of the assessed risk will depend on the extent by which it exceeds the historical risks, or
- If the assessed risk is less than historical risks that are unacceptable, treatment of the assessed risk will depend on the extent by which it is less than the historical risks, or
- If the assessed risk is less than historical risks that are acceptable, the assessed risk would also be acceptable and would not require any treatment.

#### 4.4.5 Risk Treatment

In this step, the Contractor will select and implement appropriate measures for dealing with risk. Typically measures comprise the following:

- Elimination by changing designs, procedures, management methods, etc, applicable to high frequency–high consequence risks, or
- Reduction by changing designs, procedures, management methods, etc, applicable to high frequency–high consequence risks, or
- Minimization by changing designs, procedures, management methods, etc, applicable to high frequency–low consequence risks, or
- Transfer or share whole or part of the risk to another party by insurance, contractual arrangements or organizational structures, applicable to low frequency–high consequence risks, or
- Control to ensure that risks do not increase, applicable to low frequency–high consequence risks, or
- Retention together with provision of monitoring and personal protective equipment, applicable to low frequency–low consequence residual risks after reduction, or

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- Acceptance without particular action other than provision of personal protective equipment, applicable to low frequency–low consequence risks.

The following principles enable the optimum treatment to be determined:

- Avoid risks altogether if possible by using different approaches, substances or methods of work,
- Combat risks at source rather than by adopting secondary measures,
- Adapt work to the individual rather than the individual to the work, that is, in the design consider the people and their attributes that will operate the system
- Take advantage of technological and technical progress,
- Risk prevention measures must be part of a coherent policy and approach to safety management that involves performance measurement, goal setting, feedback and analysis,
- Give preference to measures that protect the whole work force,
- Ensure that those for whom protection is provided understand what they need to do to make sure that the protection works, and
- Ensure that measures to control risks are an accepted part of an active health and safety culture supported by all levels of the organization; single risk reduction initiatives invariably fail.

#### 4.4.6

##### *Reporting and Recording*

The Contractor shall ensure that the risk assessment process is recorded in the form of a report and included in his Health and Safety Plan. The report should be easily accessible to the Contractor's employees, their representatives, to inspectors, the Employer or his Safety Agent and the Engineer. The essential contents of the report should be as follows:

- Objectives and expected outcomes,
- Description of the Works under assessment,
- Summary of context of study
- Composition of risk assessment team, (including qualifications and relevant experience),
- Approach used to systematically identify risks,
- Identified risks (ranked in order of priority),
- Method adopted for assessing frequencies and consequences of risks,
- Consequences (ranked in order of magnitude),
- Identification of individuals and groups who may be affected by major hazards and risk and who may especially be at risk,
- Basis for defining safety standards to be achieved,

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- Contractor's resources devoted to risk assessment,
- Actions proposed to reduce unacceptably high risks,
- Review effectiveness of existing safety measures to control risks, and
- Implementation programme of selected treatments (including controls to manage unacceptably high risks).

#### 4.4.7

##### *Monitoring and Review*

It is necessary to monitor risks, the effectiveness of the risk treatment plan and the strategies and management system set up to control implementation. Control of the risk management program entails the setting of standards, monitoring actual performance, comparing the performance with the standards and correcting any deviations from the standard. Risks and the effectiveness of the control measures need to be monitored to ensure changing circumstances do not alter risk priorities. Few risks remain static.

Ongoing review is essential to ensure that the management plan remains relevant. Factors that affect the likelihood and consequences of an outcome may change, as many factors that affect the suitability or cost of the various treatment options. If an accident occurs, or if more is learnt about the hazards in the workplace, the risk assessment may need to be reviewed or modified. Hazards may be observed that have not been anticipated or previously identified and which may require appropriate measures to be taken. After an accident has occurred, it is important to determine whether it was predicted, whether preventive measures were identified, and if so, why they did not work, whether the risk assessment is still suitable and sufficient if it failed to predict the accident, whether the decision to accept a predicted risk as tolerable is still valid, why the accident occurred and what should be done to prevent similar accidents occurring again. It is therefore necessary to regularly repeat the risk management cycle, the time between reviews being dependent on the nature of the risks and the degree of change likely to take place in the work activity. Review is an integral part of the risk management treatment plan.

#### 4.4.8

##### *Communication and Consultation*

The Contractor will be required to communicate and consult with internal and external stakeholders during each step of the risk assessment process. Stakeholders will include the Employer and his Safety Agent, the Engineer and the Contractor's employees and consultants.

Effective communication will ensure that those responsible for implementing the risk management process and those with a vested

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interest, understand the basis on which decisions are made and why particular actions are taken. It will also ensure that the perceptions of all those involved are noted and accommodated during the process.

### **C3.6.2.5 RESOURCES**

#### **5.1 General**

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its Regulations and related incorporated standards with regards to the resources and facilities intended for use on the temporary and permanent Works.

#### **5.2 Employees**

##### *5.2.1 Inspectors, supervisors and Issuers*

The Contractor shall provide in his Health and Safety Plan his intended Staffing Organogram for the Works. The organogram should include those inspectors, supervisors and issuers as envisaged in the Construction Regulations, 2003 required for the Works and any additional supervisory staff members as the Contractor (having taken the scope of the Works into account) considers necessary.

Copies of the supervisory staffs' curriculum vitae or portfolio of evidence and their appointment letters should be appended to the Contractor's Health and Safety Plan.

The Contractor's Health and Safety Plan should in addition cover at least the following aspects:

- The number of unskilled, semi-skilled and skilled (including Foreman, Charge hands, Artisans, Operators, Drivers, Clerks, Storeman and Team Leaders) employees he intends employing on the Works,
- The health and safety training to be provided to the Contractor's employees,
- The programme of the health and safety training,
- Systems for the review of the effectiveness of the training provided, and
- Systems to determine further training requirements throughout the construction period.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

In preparing his Health and Safety Plan, the Contractor shall ensure compliance with Clause PS 22 in Section 4.2 of the Project Specifications.

Pro-forma letters of appointment for the various inspectors, supervisors and issuers as contemplated in the Construction Regulations, 2003 are included in Annexure 1 to this specification for use by the Contractor. The Contractor shall ensure that he includes in his Health and Safety Plan the appointment letters for all his inspectors, supervisors and issuers appointed for the Works.

#### 5.2.2 Subcontractors

The Contractor shall with reference to the use of subcontractors on the Works and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- The steps intended to ensure that his Subcontractors prepare, implement and maintain Health and Safety Plans,
- How health and safety information will be made available to his Subcontractors when changes are brought about to the design,
- How he intends determining that his Subcontractors are registered and in good standing with the compensation fund or with a licensed compensation insurer prior to the commencement of the Works,
- How he intends determining if his Subcontractors have made provision in their tenders for the cost of health and safety measures during the construction of the Works,
- How he intends satisfying himself on the competencies and resources of Subcontractors he intends appointing, and
- How he intends ensuring that his Subcontractors perform risk assessments prior to commencing their respective portions of the Works.

#### 5.2.3 Competencies

The Contractor shall establish if a person is competent to perform a certain duty or be appointed in a certain capacity by requesting all candidates to supply the required certificates of competency. Where certificates of competencies cannot be delivered, the Contractor shall request a portfolio of evidence from the respective candidates.

Contractors should do enquiries at the South African Qualifications Authority (SAQUA) relating to the qualifications required for appointment of competent persons.

### 5.3 Plant, Vehicles and Equipment

C. C.3.138

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

5.3.1 *Suspended platform*

The Contractor shall with reference to Regulation 15: Suspended platforms of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends complying with SANS 1808 and SANS 1903,
- What systems he intends using to ensure the safety of all suspended platforms,
- What tests will be performed to establish the safety of suspended platforms,
- How he intends maintaining suspended platforms being used, and
- How he will document the design, testing, maintenance and inspections of the suspended platforms.

5.3.2 *Boatswains chairs*

The Contractor shall with reference to Regulation 16: Boatswains chairs of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- Explain what systems he intends using to ensure the safety of all boatswains chairs,
- Explain how he intends maintaining boatswains chairs in use,
- What tests will be performed to establish the safety of boatswains chairs, and
- How he will document the design, testing, maintenance and inspections of the boatswains chairs.

5.3.3 *Material hoists*

The Contractor shall with reference to Regulation 17: Materials Hoist, of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends confirming the construction stability of the material hoists,
- What systems he intends using to ensure the safety of all material hoists,
- What tests will be performed to establish the safety of all material hoists,
- How he intends maintaining the material hoists being used, and
- How he will document the design, testing, maintenance and inspections of all material hoists and

C. C.3.139

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

- What safety procedures and precautions are envisaged to ensure safe operation of the materials hoists.

#### 5.3.4 *Batch Plants*

The Contractor shall with reference to Regulation 18: Batch plants of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- What systems he intends using to ensure the safety of all batch plants,
- How he intends maintaining the batch plants in use, and
- How he will document the design, testing, maintenance and inspections of batch plants in use.

#### 5.3.5 *Explosive powered tools*

The Contractor shall with reference to Regulation 19: Explosive powered tools, of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends controlling the issuing of explosive powered tools,
- How he intends implementing safety procedures prior to use of explosive powered tools, and
- What safety measures will be required during the use of explosive powered tools.

#### 5.3.6 *Cranes*

This section of the specification shall be read in conjunction with the provisions of the Driven Machinery Regulations, 1988.

The Contractor shall with reference to Regulation 20: Cranes, of the Construction Regulations, 2003 and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How will environmental factors be taken into account in respect to the use of cranes,
- What systems he intends using to ensure the safety of all cranes in use,
- How he intends maintaining cranes in use,
- What tests will be performed to establish the safety of all cranes in use,

C. C.3.140

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

- What safety procedures and precautions are envisaged to ensure the safe operation of all cranes in use,
- How he will document the design, testing, maintenance and inspections of all cranes in use, and
- The contractor shall proof compliance of the Driven Machinery Regulation, 1988, with reference to the lifting machinery and tackle being used.

#### 5.3.7 *Construction vehicles and mobile plant*

The Contractor shall with reference to Regulation 21: Construction vehicles and mobile plant of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends ensuring that construction vehicles and mobile plant are:
  - Of acceptable design and construction,
  - Maintained and in good working order,
  - Used according to design specifications, and
  - Are protected from falling into excavations, water or areas lower than the working surfaces,
- How he intends ensuring that workers are trained, authorised and physically fit to operate construction vehicles and mobile plant,
- What traffic arrangements and safety precautions will be implemented to ensure safe operation of construction vehicles and mobile plant on the Works, and
- How he intends safeguarding employees against construction vehicles and mobile plant moving on the construction site.

#### 5.3.8 *Electrical Installation and Machinery on construction sites*

This section of the specification shall be read in conjunction with the provisions contained in the Electrical Installation Regulations, 1992.

The Contractor shall with reference to Regulation 22: Electrical Installation and machinery on construction sites of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends safeguarding employees against electrical cables or apparatus under, over or on site, and
- How he will ensure that electrical installations are of adequate strength to withstand working conditions on a construction site.

C. C.3.141

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

#### 5.3.9 Ladders

The Contractor shall with reference to Regulation 13A of the General Safety Regulations and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How he intends ensuring that ladders used are safe and constructed of materials approved for its intended use, and
- What precaution will be made to ensure the stability of ladders in use.

### C3.6.2.6 MATERIALS

#### 6.1 General

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its regulations and related incorporated standards with regards to the design, supply, storage and erection of materials used for the temporary and permanent Works.

#### 6.2 Fall Protection Equipment

The Contractor shall with reference to Regulation 8: Fall Protection Equipment of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- Compilation of a fall protection plan,
- How the fall protection plan will be implemented and maintained,
- How employees will be screened and declared medically fit to work in areas where fall protection equipment is needed,
- How the safeguarding of persons, plant, vehicles, equipment and facilities on the construction site is contemplated,
- Training of staff working at heights and in the use of fall protection equipment,
- How a continuous assessment of the situation will be executed,
- How fall protection equipment will be inspected for safety, and
- How corrective actions will be implemented
- Emergency plans and procedures for treatment of incidents relating to falls from height.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2



### 6.3 Scaffolding

The Contractor shall with reference to Regulation 14: Scaffolding of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How compliance with SANS 085 will be ensured,
- How scaffolding in use will be maintained,
- What systems are intended to ensure the safety of scaffolding used, and
- What tests will be performed to establish the safety of scaffolding used
- Training plan for scaffold erectors and inspectors.

### 6.4 Use and temporary storage of flammable liquids on construction sites

This section of the specification shall be read in conjunction with the provisions for the use and storage of flammable goods as determined in the General Safety Regulations.

The Contractor shall with reference to Regulation 23: Use and temporary storage of flammable liquids on construction sites of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How flammable liquids will be stored to minimize the risk of fire or explosions,
- How the contractor will identify a flammable store
- What safety precautions will be employed if ventilation of the flammable store is not possible,
- How access to flammable stores will be controlled,
- How empty vessels used for the storage of flammable liquids will be disposed of,
- What quantity of flammable liquids will be stored on the construction site,
- What systems are intended to ensure the safe storage of flammable liquids, and
- What retaining methods will be used to prevent the spreading of any spillage.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

## 6.5                    **Stacking and storage**

This section of the specification shall be read in conjunction with the provisions for the stacking of articles contained in the General Safety Regulations.

The Contractor shall with reference to Regulation 26: Stacking and storage on construction sites of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- Who will supervise the stacking and storage of materials on site, and
- What systems are intended to ensure the safe stacking and storage of materials on the site

## 6.6                    **Personnel Safety Equipment and Facilities**

The Contractor shall comply with Section 2 of the General Safety Regulations, and shall in particular provide all necessary personnel protective equipment for his personnel for the duration of the construction period. To this end the Contractor shall without limiting his obligations indicate in his Health and Safety Plan:

- Identify training requirements in the Contractors Training plan in the use and maintenance of personal protective equipment,
- The type of personnel safety equipment he will provide,
- How he intends issuing it to his employees, and
- How he will maintain the personnel safety equipment issued.

## 6.7                    **First Aid, Emergency Equipment and Procedures**

The Contractor shall comply with Section 3 of the General Safety Regulations regarding first aid, emergency equipment and procedures.

### C3.6.2.7           **CATEGORIES OF WORK**

In this section of his Health and Safety Plan, the Contractor will be required to state how he intends to comply with the requirements of the Occupational Health and Safety Act, 1993 and all its regulations and

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related incorporated standards with regards to the execution of the following categories of work.

## 7.1 General

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

### 7.1.1 Construction welfare facilities

Contractors will be required to adhere to Regulation 28: Construction welfare facilities of the Construction Regulations, 2003.

This regulation must be read in conjunction with the provisions of the Facilities Regulations, 1990 (as amended) and SANS 0400.

The Contractor must discuss the following in detail in his safety plan:

- How will the Contractor establish the amount of facilities required for employees to shower, change, eat and attend to sanitary needs
- What measures will the employer take to house employees on site who lives far from their residences or for the provision of transport

### 7.1.2 Environmental regulations for workplaces

The Contractor shall comply with the Environmental Regulations for Workplaces, 1987, and shall address the following aspects as described in the regulations in his Health and Safety plan:

- Thermal requirements,
- Lighting,
- Windows,
- Ventilation,
- Housekeeping,
- Noise and hearing conservation,
- Precautions against flooding, and
- Fire precautions and means of egress.

### 7.1.3 Housekeeping on construction sites

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Employer

Witness 1

Witness 2

Contractors will be required to adhere to Construction Regulation 25: Housekeeping on construction sites, of the Construction Regulations, 2003.

This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Contractor must discuss the following in detail in his safety plan:

- How will contractors ensure the neatness of construction sites
- What measures does the Contractor envisage to
  - Store and/or stack materials,
  - Remove debris from site,
  - Prevent unauthorized entrance to the site
  - Protect employees or passers-by from falling objects

#### 7.1.4 *Fire precaution on construction sites*

Contractors will be required to adhere to Construction Regulation 27: Fire precautions on construction sites, of the Construction Regulations, 2003.

This regulation must be read in conjunction with the provisions of the Environmental Regulations for Workplaces, 1987 (as amended).

The Contractor must discuss the following in detail in his safety plan:

- How the Contractor will minimize the risk of fire on the site
- How the Contractor will identify potential fire hazards
- What prohibitions the Contractor will implement to manage risk areas
- How many employees the Contractor will train in fire fighting
- What organization the Contractor envisage to combat fires on sites
- What precautions and procedures will be followed to evacuate employees in the case of a fire

#### 7.1.5 *Water Environments*

The Contractor will be required to adhere to Construction Regulation 24: Water Environments, of the Construction Regulations, 2003.

The Contractor must discuss the following in detail in his safety plan:

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Employer

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Witness 1

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Witness 2

- What precautions will the Contractor take to identify dangers where employees may fall into water
- What safety procedures and equipment will the Contractor implement to safeguard employees working at water environments

#### 7.1.6 Structures

The Contractor will be required to adhere to Construction Regulation 9: Structures, of the Construction Regulations, 2003.

The Contractor must discuss the following in detail in his safety plan:

- Explain what controls, test or precautions will be made to prevent structures from collapsing during construction,
- The Contractor shall indicate what steps will be taken and implemented to ensure that structures or parts thereof will not be loaded in such a manner that it may collapse, and
- What procedures does the Contractor envisage to implement in order to obtain all relevant data on structures before commencement of construction work.

#### 7.1.7 Watching, barricading and lighting

The Contractor will be required to adhere to regulations 11.3. (i) and 11.3.(l) of the Construction Regulations, 2003.

The Contractor must discuss the following in detail in his safety plan in respect of any excavation or other dangerous activity adjacent to public roads and thoroughfares:

- Type of barrier or fencing to be used,
- Type and spacing of warning lights and warning signs, and
- Control systems and personnel he intends employing to ensure that the above items are maintained.

### 7.2 Site Clearance

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

#### 7.2.1 Demolition work

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Contractor

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Witness 2

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Witness 1

Witness 2

Contractors will be required to adhere to Construction Regulation 12: Demolition work, of the Construction Regulations, 2003.

The Contractor shall discuss the following in detail in his safety plan:

- Briefly explain how he will safeguard people and property during and after demolition works
- Briefly explain how he will protect staff from dangerous situations
- Discuss the methods proposed to safeguard the public and property against harm during demolition works
- Discuss what type of equipment he envisage to use during demolition work
- How will the Contractor ensure the safety of equipment used during demolition work
- What steps will the Contractor deem necessary to take where hazardous materials is encountered

### 7.3 Earthworks

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

#### 7.3.1 Excavation work

Contractors will be required to adhere to Construction Regulation 11: Excavation work, of the Construction Regulations, 2003.

The Contractor must discuss the following in detail in his safety plan:

- How will the Contractor establish the stability of ground prior to excavations,
- What steps will the Contractor follow to ensure that bolstering, shoring and bracing is sufficient to ensure the safety of the excavation, and
- What steps will the Contractor follow to ensure the equipment used to safeguard an excavation is sufficient and safe.

### 7.4 Concrete

The Contractor shall, without limiting his obligations, cover at least the following matters in his Health and Safety Plan under this category of work:

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Witness 1

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Witness 1

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#### 7.4.1 Formwork and support work

The Contractor shall with reference to Regulation 10: Formwork and support work, of the Construction Regulations, 2003, and without limiting his obligations, cover at least the following matters in his Health and Safety Plan:

- How the design of formwork and support work will be carried out,
- How the erection of formwork and support work will be managed,
- How the continuous assessment of the safety of formwork will be done,
- How the loading of formwork and support work will be managed or limited, and
- How he intends keeping records of the above.

#### 7.5 Pipes

The Contractor shall comply with Section 9 of the General Safety Regulations, with regards to the welding, flame cutting, grinding, soldering or similar operations associated with pipework.

The Contractor shall comply with Section 5 of the General Safety Regulations, with regards to work in confined spaces.

### C3.6.2.8 IMPLEMENTATION OF CONTRACTOR'S HEALTH AND SAFETY PLAN

#### 8.1 General

The Contractor shall describe in his Health and Safety Plan how he intends implementing his plan.

The Contractor shall indicate the methods he intends using to ensure accurate record keeping of all critical elements identified in his risk assessment and covered in his Health and Safety Plan.

The Contractor shall indicate how internal audits will be carried out, how shortcomings will be addressed, how he intends to review the safety plans, how he would train staff and how he would implement the findings and recommendations of internal audits or inputs of employees.

#### 8.2 Administrative Systems

C. C.3.149

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

.The Contractor shall comply with Section 9 of the General Administrative Regulations, 1996. The Contractor's administrative system shall without limiting his obligations, cover the following:

- Up keep of a safety file on site,
- Maintenance of his Health and Safety plan,
- Procedures to follow for the appointment of competent persons,
- Application for permits,
- Procedures to follow for notifications,
- Injury on duty [IOD] administration,
- Recording of minutes of safety meetings,
- Recording of checklists,
- Safe keeping of checklists, and
- Internal audits.

The Contractor shall in particular ensure that at least one copy of the Occupational Health and Safety Act,1993 and its Regulations is available on the for every 20 employees employed.

### 8.3 Reporting Systems

The Contractor shall comply with Section 9 of the General Administrative Regulations, 1996 and shall in particular (in accordance with section 12) furnish an inspector with information relating to health and safety on the construction site, when requested to do so.

The Contractor shall notify the Employer of any investigations, complaint or criminal charge which may arise as a consequence of the provision of the Occupational Health and Safety Act, 1993 and its Regulations, pursuant to work performed in terms of this Contract.

### 8.4 Training

The Contractor shall train all his employees in accordance with the requirements of section 13 of the Occupational Health and Safety Act, 1993. The Contractor shall ensure that every employee is informed of the following:

- The hazards of any work he has to perform or plant machinery or equipment he is permitted to use, and
- The precautionary measures which should be taken regarding the above.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2



The Contractor shall, without limiting his obligations, indicate in his Health and Safety Plan how he intends:

- Identifying the training needs of the personnel he intends employing, and
- Implementing the training identified.

## 8.5 Inspections and Monitoring

The Contractor shall be required to inspect each workplace prior to works commencing to ensure that all protective equipment is in place and that by entering the workplace no person will be exposed to any hazard which could affect his health or safety. The Contractor shall without limiting his obligations, indicate the following in his Health and Safety Plan:

- The inspection and monitoring procedures he intends employing to determine the safety of workplaces, and
- Who will be responsible for the checking of each workplace at the commencement of each shift.

The Contractor shall include in his Health and safety Plan all the checklists he intends using during the inspection and monitoring of the implementation of his Health and Safety Plan.

The Contractor can expect inspections of the works by any of the following parties:

- The Employer or his Safety Agent, or
- The designated officer serving in the Department of Manpower and appointed by the Minister as chief inspector or his representative.

In addition to site inspections performed by the Employer or his safety agent they shall also do audits and assess the safety situation at the works and investigate incidents. Follow-up inspections will be performed to ensure compliance to recommendations done.

Inspections by the Chief inspector or his representative will be by appointment and the purpose would be to investigate complaints received by the Inspector or to investigate serious incidents.

The Chief Inspector or his representative may issue prohibition notices to stop the activities at the works until the situation investigated has been resolved or he may issue an improvement notice whereby the Contractor will have a period to rectify any hazard identified by the inspector.

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

### **C3.6.2.9 AUDITING**

#### **9.1 Internal Audits**

The audits contemplated in regulation 4.(1)(d) of the Construction Regulations,2003 will be carried out by the Employer or his appointed Safety Agent.

The intervals for the audits shall be agreed between the Contractor and the Employer or his Safety Agent during the preparation of the Contractor's Health and Safety Plan, but shall be carried out at least once every month or at such shorter interval that an inspector may require. The Employer or his Safety Agent shall provide at least 7 calendar days notice prior to the conducting of an audit.

The findings of each audit will be made known to the Contractor and the Employer in a report prepared by the Employer or his Safety Agent and will be submitted to all parties within seven working days of the respective audit being completed. Any shortfalls identified will be documented in the audit report together with the Contractor's proposals to rectify the same. All audit reports will be filed in the Health and Safety File.

A date for a follow up audit will be negotiated with the Contractor to verify the implementation of all actions to rectify shortfalls as identified in the audit report.

The Contractor will ensure that the same arrangement detailed above be implemented with his Contractors to ensure his compliance with the Construction Regulations and contemplated in regulation 5. (3)(c).

The audits described above only constitutes part compliance by the Employer or the Safety Agent with regulation 4.(1)(c) of the Construction Regulations, 2003.

#### **9.2 Audits by Employer or Safety Agent**

The Employer or Safety Agent will be entitled to carry out additional audits or follow-up audits, as the case may be, at any time during the construction period provided that:

- i) The audit or follow-up audit are carried out during ordinary working hours, and

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Employer

Witness 1

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- ii) The Employer or Safety Agent gives the Contractor at least 24 hours notice of his intention to carry out such audits.

The Contractor's employees indicated in Section 9.1 will be present during any audit carried out by the Employer or his Safety Agent.

### **C3.6.2.10 MEASUREMENT AND PAYMENT**

#### **10.1 Measurement and Payment**

10.1.1 The scheduled items for health and safety will be included in the preliminary and general section of the schedule of quantities. Measurement will be in terms of Clause 8.1.2 of SANS 1200 A.

10.1.2 The Contractor shall price all items scheduled in this section of the schedule of quantities to enable the Employer to comply with clause 4.1.(h) of the Construction Regulations, 2003. Failure by the Contractor to price these items will force the Employer to reject the Contractor's tender in terms of clause 4.(4) of the Construction Regulations, 2003.

10.1.3 Payment for the scheduled items will be in terms of clause 8.2 of SANS1200 A.

#### **10.2 Scheduled Items**

##### **10.2.1 General**

The maintenance of safe work practice at all times and in all sections of the execution of the works is embedded in the day to day site activities of all the Contractor's management, staff and workforce on the contract.

However, the introduction of the Construction Regulations in 2003 requires from the Employer to ensure that the Contractor has made adequate provision for the execution of the works within the specifications of said regulations. The following items have been identified as critical towards ensuring the minimum standards of safe work practice:

It must be noted that the lists below are not exhaustive and that many items have been t Regulations, requires that the Contractor ensures adherence to the Occupational Health and Safety Act (Act 85 of 1993) the Construction Regulations, 2003.

##### **10.2.2 Fixed-Charge Items**

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Contractor

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Employer

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Witness 1

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Witness 2

- a) Compliance with the Occupational Health and Safety Act ..... Unit: Sum  
(Act 85 of 1993) and its regulations and with the Employer's  
Health and Safety Specification

The fixed charge item shall include but shall not be limited to the following:

- Health and Safety Training
- Personal Protective Clothing and Equipment
- Fences, Signs and Barricades
- Establishment of Safety Administration
- Other Health and Safety Fixed-charge Obligations

10.2.3 *Time-related Items*

- a) Compliance with the Occupational Health and Safety Act ..... Unit: Sum  
(Act 85 of 1993) and its regulations and with the Employer's  
Health and Safety Specification

The time related item shall include but shall not be limited to the following:

- The employment cost of all health and safety personnel including consultants, health and safety officers, inspectors, supervisors and issuers required in terms of the Contractor's Health and Safety Plan,
- Updating the Health and Safety Plan as needed,
- Carrying out of periodic own audits and follow-up audits,
- Compiling ongoing risk assessments and risk assessment reports as required by the Works,
- Convening of regular safety meetings with the Safety Representatives,
- Accompanying and supporting the Employer or his Safety Agent during ad hoc audits,
- Compilation of monthly safety reports and statistics for the Employer or his Safety Agent,
- Implementation and maintenance of Training
- Maintenance of personal protective clothing and equipment
- Maintenance of fences, signs and barricades
- Implementation and maintenance of safety administration
- Other Health and Safety Time-related Obligations

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Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

## ANNEXURES

### ANNEXURE 1-APPOINTMENT LETTERS

C. C.3.155



*Contractor*



*Witness 1*



*Witness 2*



*Employer*



*Witness 1*



*Witness 2*

**ANNEXURES**

**ANNEXURE 2-NOTIFICATION TEMPLATE**

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Contractor

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### **C3.6.3 ENVIRONMENTAL MANAGEMENT PLAN**

#### **CONTENTS**

C3.6.3.1	SCOPE
C3.6.3.2	DEFINITIONS
C3.6.3.3	IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS
C3.6.3.4	LEGAL REQUIREMENTS
C3.6.3.5	ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS
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C3.6.3.9	RECORD KEEPING
C3.6.3.10	COMPLIANCE AND PENALTIES
C3.6.3.11	MEASUREMENT AND PAYMENT

#### **C3.6.3.1 SCOPE**

This environmental management programme (EMP) sets out the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, and the project specifications, as the defects notification period (maintenance period).

The provisions of this EMP are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. In the event that any conflict occurs between the terms of the EMP and the project specifications or Record of Decision, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the Roads Municipality Limpopo in writing for approval.

The EMP identifies the following:

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Contractor

Witness 1

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Employer

Witness 1

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Construction activities that will impact on the environment.

Specifications with which the contractor shall comply in order to protect the environment from the identified impacts.

Actions that shall be taken in the event of non-compliance.

### C3.6.3.2 DEFINITIONS

**Alien Vegetation:** alien vegetation is defined as undesirable plant growth which shall include, but not be limited to; all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

**Construction Activity:** a construction activity is any action taken by the contractor, his subcontractors, suppliers or personnel during the construction process as defined in the South African National Roads Municipality Limited and National Roads Act, 1998 (Act No. 7, 1998)

**Environment:** environment means the surroundings within which humans exist and that could be made up of -

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

**Environmental Aspect:** an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

**Environmental Impact:** an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

**Record of Decision:** a record of decision is a written statement from the National Department of Environmental Affairs and Tourism, (N.DEAT), that records its approval of a planned undertaking to improve, upgrade or rehabilitate a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

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**Road Reserve:** the road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

**Road Width:** for the purposes of the EMP, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of a water course.

### **C3.6.3.3 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS**

The contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

- waste generation
- stormwater discharge
- emission of pollutants into the atmosphere
- chemical use operations
- energy use operations
- water use operations
- use of natural resources
- noise generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce an approved construction programme according to subclause 8.3 as amended by Particular Condition of the general conditions of contract and clause PSA of these project specifications.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

Pollution of atmosphere, soil or water

Destruction or removal of fauna and flora and effect on biological diversity

Deformation of the landscape

Soil erosion

Destruction of historical/heritage sites

Effect on the built environment

Effect on agricultural land and wetlands

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General good construction practice will play an important role in avoiding the occurrence of an Impact. The contractor's attention is drawn, in this regard, to C1008. Environmental Management of Construction Activities

#### **C3.6.3.4 LEGAL REQUIREMENTS**

##### **a) General**

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

##### **b) Statutory and other applicable legislation**

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

#### **C3.6.3.5 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS**

##### **a) Appointment of a Designated Environmental Officer (DEO)**

For the purposes of implementing the conditions contained herein, the contractor shall submit to the engineer for approval the appointment of a nominated representative of the contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision. The engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The engineer will be responsible for issuing instructions to the contractor where environmental considerations call for action to be taken. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The engineer shall have the authority to instruct the contractor to replace the DEO if, in the engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the

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requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times.

b) Administration

Before the contractor begins each construction activity the DEO shall give to the engineer a written statement setting out the following:

The type of construction activity.

Locality where the activity will take place.

Identification of the environmental aspects and impacts that might result from the activity.

Methodology for impact prevention for each activity or aspect.

Methodology for impact containment for each activity or aspect.

Emergency/disaster incident and reaction procedures.

Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

c) Good Housekeeping

The Contractor shall undertake "good housekeeping" practices during construction as stated in clause 1217 of the COLTO Standard Specifications for Roads and Bridges and subclauses 4.18 and 11.11 of the General Conditions of Contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

### C3.6.3.6 TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

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The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Municipality's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he/she intends concluding his environmental training obligations.

### **C3.6.3.7 ACTIVITIES/ASPECTS CAUSING IMPACTS**

A list of possible causes of environmental impacts that occur during construction activities is given in Table 7/1: Aspects or Activities that Cause Environmental Impacts during Construction Activities, which is to be found at the end of this part. This list is not exhaustive, and shall be used for guideline purposes only.

### **C3.6.3.8 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES**

a) Site Establishment

i) Site Plan

The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be

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sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site. Read with COLTO Specification 1302(a), 1402 (e).

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. (Read in conjunction with COLTO Specification 5801(b), 5802(b), (c), (d) and (e), 5804, 5805, 5806 and 5807). Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii) Rehabilitation

The area where the site offices were erected will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

iv) Water for human consumption

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans dams etc). Only domestic type wastewater shall be allowed to enter this drain.

v) Heating and Cooking fuel

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The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

b) Sewage treatment

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of project management, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a subcontractor. The type of sewage treatment will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer. Read with COLTO Specifications 1402(g) and 1404(a).

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the engineer.

c) Waste Management

The contractor’s intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid Waste

Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the engineer. Disposal of solid waste shall be at a Department of Water Affairs and Forestry (DWAF) licensed landfill site or at a site approved by DWAF in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near

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the site offices, nor anywhere else on the site, including the approved solid waste disposal site. Read with COLTO Specification 1404(a).

ii) Litter

No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.

Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites. (Read with COLTO Specification 1302(b)).

iii) Hazardous waste

Hazardous waste such as bitumen, tar, oils etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. Any spillage of tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

d) Control at the workshop

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i) Safety

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by, the staff whose duty it is to manage and maintain the contractor's and his subcontractor's and supplier's plant, machinery and equipment.

ii) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or

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containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

iii) Fuel and Gas Storage

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

iv) Oil and Lubricant Waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

e) Clearing the Site

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the engineer for his approval.

The plan shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated

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for, or from, road construction has to be stored temporarily or otherwise within the road reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the defects notification period.

f) Soil Management

i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include the storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved Department of Water Affairs and Forestry waste disposal site. (Read with COLTO Specifications 3104(a), 5802(a), (g), 5804(a), (b) and (c)). The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m, and if they are to be left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for rehabilitation purposes.

g) Drainage

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage

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pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

h) Earthworks and Layerworks

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the contractor shall have complied with the requirements of sections C1008 (e) and C1008 (g). In addition, the contractor shall take cognisance of the requirements set out below.

i) Quarries and borrow pits

The contractor's attention is drawn to the requirement of the Department of Minerals and Energy that before entry into any quarry or borrow pit, an EMP for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the contractor to ensure that he is in possession of the approved EMP or a copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMP are legally binding on the contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific EMP and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Bill of Quantities. (Read with COLTO Specification 3100 and 3200).

ii) Excavation, hauling and placement

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, and sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at

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the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity. (Read with COLTO Standard Specification clauses 1217 and 3309)

iii) Spoil sites

The contractor shall be responsible for the safe sitting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The engineer will assist the contractor in obtaining the necessary approval if requested by the contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:3. Only under exceptional circumstances will approval be given to exceed this ratio. Appropriate grassing measures to minimise soil erosion shall be undertaken by the contractor. This will include both strip and full sodding. The contractor may motivate to the engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability (Read with COLTO standard Specifications clause 1214). The contractor's costs incurred in obtaining the necessary certification for opening and closing of spoil sites shall be deemed to be included in the tendered rates for spoiling.

iv) Stockpiles

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the engineer for his approval, together with the contractor's proposed measures for prevention, containment and rehabilitation against environmental damage.

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The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the contractor shall at all times ensure that they are:

- Positioned and sloped to create the least visual impact;
- Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and
- Kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the engineer and the relevant Authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in-situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract drawing or under instruction from the engineer

In all cases, the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their clause only when they have been satisfactorily rehabilitated. (Read with COLTO Specification 3203 and 4306).

v)      **Blasting activities**

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to advertise to the adjacent communities and/or road users the times and delays to be expected for each individual blast.

i)      **Batching sites**

Asphalt plants are considered scheduled processes listed in the second schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). Should the use of an

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asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs and Tourism, regardless of where they are sited.

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1008(h)(iii), with the exception that the contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The engineer will assist the contractor in his submissions to the relevant authority.

Effluent from concrete batch plants and crusher plants shall be treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval.

The contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart

j) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill treatment lies with the contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the engineer. The Designated Environmental Officer will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such

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input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

k) Areas of Specific Importance

Any area, as determined and identified within the project document as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the approved EMP. The contractor may offer alternative solutions to the engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection shall not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall require ad hoc treatment.

i) Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The National Monuments Council is to be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. (Read with COLTO General Condition of Contract Subclause 4.24 as amended by Particular Condition).

ii) Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. The National Monuments Council should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the National Monuments Council, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred. (Read with COLTO General Conditions of Contract Subclause 4.24 as amended by Particular Condition).

l) Noise Control

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

m) Dust Control

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Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

n) Alien Vegetation

The contractor shall be held responsible for the removal of alien vegetation within the road reserve disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily or otherwise within the road reserve. This responsibility shall extend for the duration of the defects notification period.

### **C3.6.3.9 RECORD KEEPING**

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

### **C3.6.3.10 COMPLIANCE AND PENALTIES**

The contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

The following penalties shall apply for environmental violations:

a) **Unnecessary removal or damage to trees**

- 2600mm girth or less : R 5 000 per tree

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- Greater than 2600mm, but less than 6180mm girth : R10 000 per tree
- Greater than 6180mm girth : R30 000 per tree

**b) Serious violations:**

- Hazardous chemical/oil spill and/or dumping in non-approved sites. : R10 000 per incident
- General damage to sensitive environments. : R 5 000 per incident
- Damage to cultural and historical sites. : R 5 000 per incident
- Uncontrolled/unmanaged erosion (plus rehabilitation at contractor's cost). : R1 000 to R5 000 per incident
- Unauthorised blasting activities. : R 5 000 per incident
- Pollution of water sources. : R 10 000 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

**c) Less serious violations:**

- Littering on site. : R1 000 per incident
- Lighting of illegal fires on site. : R1 000 per incident
- Persistent or un-repaired fuel and oil leaks. : R1 000 per incident
- Excess dust or excess noise emanating from site.: R1 000 per incident
- Dumping of milled material in side drains or on grassed areas: R1 000 per incident
- Possession or use of intoxicating substances on site.:R 500 per incident
- Any vehicles being driven in excess of designated speed limits. : R 500 per incident
- Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife.: R2 000 per incident
- Illegal hunting. : R2 000 per incident
- Urination and defecation anywhere except in designated areas. : R 500 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

**C3.6.3.1 MEASUREMENT AND PAYMENT**

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<b>Item</b>	<b>Unit</b>
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**C100.01      Penalty for unnecessary removal or damage to trees**  
for the following diameter sizes

- |     |   |             |
|-----|---|-------------|
| (a) | 2600mm girth or less                            | number (No) |
| (b) | Greater than 2600mm, but less than 6180mm girth | number (No) |
| (c) | Greater than 6180mm girth                       | number (No) |

The unit of measurement shall be the number of trees by diameter size removed unnecessary or damaged. The penalty rates applied shall be those stated in clause C3.5.2.10.

<b>Item</b>	<b>Unit</b>
-------------	-------------

**C100.02      Penalty for serious violations**

- |     |  |             |
|-----|--|-------------|
| (a) | Hazardous chemical/oil spill and/or dumping in non-approved sites  | number (No) |
| (b) | General damage to sensitive environments   |             |
| (c) | Damage to cultural and historical sites  | number (No) |
| (d) | Pollution of water sources   | number (No) |
| (e) | Unauthorised blasting activities   | number (No) |
| (f) | Uncontrolled/unmanaged erosion per incident, depending on environment impacts, plus rehabilitation at contractor's cost) | number (No) |

The unit of measurement for C100.02 (a) to (f) shall be the number of serious violation incidents. The penalty rates to be applied shall be those stated in clause C3.5.2.10.

<b>Item</b>	<b>Unit</b>
-------------	-------------

**C100.03      Penalty for less serious violations**

- |   |  |             |
|---|--|-------------|
| • | Littering on site  | number (No) |
| • | Lighting of illegal fires on site  | number (No) |
| • | Persistent or un-repaired fuel and oil leaks   | number (No) |
| • | Excess dust or excess noise emanating from site  | number (No) |
| • | Dumping of milled material in side drains or on grassed areas                                      | number (No) |
| • | Possession or use of intoxicating substances on site   | number (No) |
| • | Any vehicles being driven in excess of designated speed limits                                     | number (No) |
| • | Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife | number (No) |

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- Illegal hunting number (No)
- Urination and defecation anywhere except in designated areas number (No)

The unit of measurement shall be the number of less serious violation incidents. The penalty rates applied shall be those stated in clause C3.5.2.10.

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

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**Table 1: Mechanisms that Cause Environmental Impacts during Construction Activities**

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
1300	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1400	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1500	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1600	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	

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SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
		Washing waste				
1700	Clearing and grubbing	Waste treatment Hazardous waste Water supply Noise /lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Protection of indigenous vegetation Preserve topsoil	
2100 2400	- Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3100	Borrow pits	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3200	Stockpiling	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

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SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
3300	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3400 3900	- Pavement layers	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
4100	Asphalt works / sealing operations	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	

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Employer

Witness 1

Witness 2

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
5000	Ancilliary roadworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	reserve indigenous vegetation Preserve topsoil Management of weeds	
6000	Structures	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
7000	Concrete pavements etc	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

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Employer

Witness 1

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**C3.7      MINISTRERIAL DETERMINATION (EPWP)**

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Witness 1

Witness 2

Employer

Witness 1

Witness 2