

STRUCTURAL ENGINEERING

SPECIFICATIONS DOCUMENT

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PART C3: SCOPE OF WORK

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C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 Description of Works

The Contract covers a new police station being constructed for policing purposes on Erf 75169 of 59037 in the area known as Khayelitsha of City of Cape Town Municipality. In addition to the main police station the project includes the provision of a cell block, detective services, support services, vispol, support services and service point. This new police station is to be constructed near the existing park home police station.

C3.1.2 Description of Site and Access

The site, Erf 75169 of 59037 is vacant and undeveloped covered with veld grass and shrubs. A portion of the site is currently occupied with park homes being utilized by SAPS, however this does not form part of the proposed works. The site is located in Khayelitsha which is approximately 30 km south east of Cape Town in the Western Cape Province. Access to the site is via Dibana Road and Cekeca Road which are typical urban collector roads coming off the M9 Road which is a major arterial road. The northern, western and southern boundaries of the site are bounded by neighbouring properties.

C3.1.3 Nature of Ground and Subsoil Conditions

The site comprises of an open field of land which is accessed via the M9 Road, Cekeca Road and Dibana Road. A detailed geotechnical investigation has been carried out and a report covering the geotechnical conditions is available. Groundwater seepage was encountered in the test pits, at a depth of 1.4m from the natural ground level, most likely fluctuating with seasonal rainfall patterns. The site area is classified as "non-dolomitic". The site is considered stable, and no geotechnical problems are anticipated provided the recommendations of the report are followed.

C3.2: PROJECT SPECIFICATIONS

PREAMBLE

In the event of any discrepancy between a part or parts of the Standard or Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the Specifications, (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Employer's Agent before the execution of the work under the relevant item.

C3.2.1 GENERAL

PS.1 PROGRAMME, METHOD OF WORK, AND ACCOMMODATION OF TRAFFIC

This Clause is to be read in conjunction with the provisions and obligations as contained in **SANS 1921-1 and SANS 1921-2**.

PS.1.1 Preliminary Program

The Contractor shall include with his tender a preliminary program on the prescribed form (**see Part T2.2: Preliminary Program**) to be completed by all Tenderers. The program shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

Tenderers may submit tenders for an alternative Time for Completion in addition to a tender based on the specified Time for Completion. Each such alternative tender shall include a preliminary program similar to the program above for the execution of the works and shall motivate his proposal clearly by stating all the financial implications of the alternative completion time.

The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his programme for all possible delays due to normal adverse weather conditions (**refer to Clause 5.12.2.2**) and special non-working days (**refer to Clause 5.1.1.1**) as specified in the in the Contract Data.

PS.1.2 Program in Terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction program, which shall conform in all respects to **Clause 5.6** of the General Conditions of Contract, be furnished within the time stated in the Contract Data (**refer to Clause 5.3.1/2**).

The preliminary program to be submitted with the tender shall be used as basis for this program.

The Tenderer's attention is drawn to the fact that a number of factors will affect the programming of and method of carrying out the works. The more important of these are:

- (1) Services: Important bulk services exist along Cekeca Road. It is essential that these services be located as soon as possible so that arrangements can be made to connect the site infrastructure to bulk services.
- (2) Traffic Accommodation: The contractor must allow accommodation of traffic using Cekeca Road. The full width of the existing road must be available for traffic during peak traffic periods.

Those known, existing services in the area of the works have been depicted on the contract drawings. It is evident, however, that the status of existing service records as far as can be ascertained might not reflect the actual situation in the field. As such, due allowance has been made in the Bill of Quantities for the proving of services were directed by the Engineer.

PS.2 SERVICES

This Clause is to be read in conjunction with the provisions and obligations as contained in **SANS 1921-1 and SANS 1921-2**.

PS.2.1 Existing Services

The Tenderer's attention is drawn to the numerous existing services in the area. Although every effort has been made to depict these services accurately the positions shown must be regarded as approximate.

PS.2.2 Proving Underground Services

This clause must be read in conjunction with **Clause DB.5.1.2**, the requirements of which shall be extended to cover all earthworks operations whether for trenching or bulk earthworks, in the vicinity of underground services.

It is stressed that all services in a particular area must be proven before commencing work in that area.

In so far as bulk earthworks are concerned, where services are indicated on the drawings or where from site observations can reasonably be expected that such services are likely to exist where excavations are to take place, the Contractor shall without instructions from the Employer's Agent carefully excavate by hand to expose and prove their positions.

The cost of proving trenches is to be included in the work covered by **Clause DA.8.3**.

When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Employer's Agent who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly. The cost of this additional searching shall be to the Council's cost and shall be paid for under **DB.8.19 - Proving Existing Services**.

Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure as laid down in this clause has not been followed then all costs in connection with the repair of the service will be to the Contractor's account.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. The position of these services located must be co-ordinated and levelled by the Contractor, and the information given in writing to the Employer's Agent's Representative.

The requirements of this clause do not relieve the Contractor of any obligations as detailed in the Conditions of Contract or under **Clause 4.17 of SANS 1921-1**.

PS.2.3 Relocation of Existing Services

This clause shall be read in conjunction with **Clause PS.1**.

Relocation of services shall generally be carried out by the relevant services organization. Generally, their work shall include the excavating and bedding the service which will include backfilling to a depth of approximately 300 mm above the service. The remainder of the backfilling shall be carried out by the Contractor.

PS.2.4 Accommodation of Services

Further to **Clauses PS.1 and PS.2** of this specification, tenderers are to note that allowance must be made under this item and / or the appropriate rates, for all costs incurred as a result of complying with these clauses. It shall also cover liaison with the services organizations and accommodation of their work gangs / contractors on site.

PS.3 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

PS.3.1 Natural Vegetation

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

Only those trees and shrubs directly affected by the works and such others as the Employer's Agent may direct in writing shall be cut down and stumped. The natural vegetation, grass and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Engineer.

PS.3.2 Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of a fire, the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires which may have been caused by him or his employees.

PS.3.3 Environmental Management Plan

In addition to the above, all requirements according to the Environmental Management Plan as detailed in **C3.4: Particular Specifications**, will be adhered to.

PS.4 OCCUPATIONAL HEALTH AND SAFETY

PS.4.1 General Statement

When considering the safety on site the Contractor's attention is drawn to the following:

1. Traffic: Traffic using Big Street for access. Full signage must be provided to warn motorists, pedestrians and provide protection to workers.
2. Trench Excavations: Excavations are required as part of the works. The sides of the trenches must be supported by shoring and or battering back. Suitable hard barricading or netting set back at least a metre from the edge of excavations.
3. Heavy Plant / Machinery: Heavy plants and machinery may be required to implement the works. At times they will be working near exiting roadways.
4. Unauthorized persons entering the area of work. Access control (signing in) by security personnel at site entrance. Warning signs at entrance indicating "No unauthorized entry". Install boundary fencing and additional security guard to patrol boundary perimeter.

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2014 issued on 7 February 2014 by the Department of Labour.

For this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of Section 37(2) of the Occupational Health and Safety Act.

PS.4.2 Health and Safety Specifications and Plans to be submitted at tender stage

PS.4.2.1 Employer's Health and Safety Specification

The Employer's Health and Safety Specification is included in **Part C3.4: Particular Specifications**.

PS.4.2.2 Tenderer's Health and Safety Plan

At the tender stage only a brief overview of the tenderers perception on the safety requirements for this contract will be adequate. This will be attached to **Part T2.2: Contractor's Health and Safety Plan**.

Only the successful Tenderer shall submit a separate Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014 and referred to in **Part T2.2: Contractor's Health and Safety Plan**.

The detailed safety plan will take into consideration the **site-specific risks as mentioned under PS.10.1** and must cover at least the following:

- (i) A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 9 to 29.
- (ii) Pro-active identification of potential hazards and unsafe working conditions.
- (iii) Provision of a safe working environment and equipment.
- (iv) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (*Regulation 7*).
- (v) Monitoring health and safety on the site of works on a regular basis and keeping of records and registers as provided for in the Construction Regulations.
- (vi) Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 8 and other applicable regulations; and
- (vii) Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

The Contractor's Health and Safety Plan will be subject to approval by the Employer, or amendment, if necessary, before commencement of construction work. The Contractor will not be allowed to commence work, or his work will be suspended if he had already commenced work, before he has obtained the Employer's written approval of his Health and Safety Plan.

Time lost due to delayed commencement or suspension of the work as a result of the Contractor's failure to obtain approval for his safety plan, shall not be used as a reason to claim for extension of time or standing time and related costs

A generic plan will not be acceptable.

PS.4.3 Cost of compliance with the OHSA Construction Regulations

The rates and prices tendered by the Contractor shall be deemed to include all costs for conforming to the requirements of the Act, the Construction Regulations and the Employer's Health and Safety Specification as applicable to this contract. Should the Contractor fail to comply with the provisions of the Construction Regulations, he will be liable for penalties as provided in the Construction Regulations and in the Employer's Health and Safety Specification.

Items that may qualify for remuneration will be specified in the Employer's Health and Safety Specification.

PS.5 SITE SECURITY

The Contractor shall, for the duration of the contract, provide sufficient security and watchmen to adequately ensure the safety and protection of the works, the Contractor's staff, including local labour and subcontractors, and all site plant and construction equipment required for the works.

Site Security, in conjunction with the SAPS (where necessary), shall be responsible for removal of disruptive elements, that may interrupt the progress of the contract through acts such as, but not limited to, intimidation, threats of disruption, violent disruption, or criminal and illegal activity by the local community or independent organizations or entities that may result in slowing down or partial or total stoppage of the works.

Payment for this item shall be made under Section 1, Part A of the Bill of Quantities.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 The Specifications on which this contract is based are the **South African Bureau of Standards Standardized Specifications for Civil Engineering Construction SANS 1200**.

Although not bound in nor issued with this Document, the following Sections of the Standardized Specifications of SANS 1200 shall form part of this Contract:

SANS 1200 A	:	GENERAL
SANS 1200 C	:	SITE CLEARANCE
SANS 1200 D	:	EARTHWORKS
SANS 1200 G	:	CONCRETE (STRUCTURAL)
SANS 1200 GA	:	CONCRETE (ORDINARY BUILDINGS)
SANS 1200 H	:	STRUCTURAL STEELWORK

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS

INTRODUCTION

In certain clauses the standard, standardized and particular specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains additional specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the **prefix PS** followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and which is included here, is also prefixed by PS, but followed by a new number which follows on the last clause or item number used in the relevant section of the standard specifications.

PSA GENERAL

PSA 5 GENERAL

PSA-5. CONSTRUCTION

PSA-5.3 Protection of Structures

The contractor shall maintain a photographic record of neighbouring fences, walls and structures for the duration of the contract and immediately notify the Engineer of any changes.

PSA 5.4 Protection of Overhead and Underground Services

Reference is made to the existing utility services in **Clause PS.2** of the Project Specifications. Where excavation is to be undertaken in the vicinity of such services, their position is to be confirmed after discussion with representatives of the authority concerned, by careful hand excavation before any other work is undertaken in the area.

When a service is not located in the expected position, the Contractor shall notify the Engineer who will decide what further action is to be carried out.

The location of the service is to be completed at least two weeks before bulk works are due to commence in the area.

Services damaged by the Contractor, in carrying out the works where the procedure described above and in Clause 5.7 have not been followed, will be repaired to the satisfaction of the Utility company concerned. All costs associated with this will be to the Contractor's account.

PSA 5.5 Dealing with Water or Works

This clause must be read in conjunction with Clause PS.3.

PSA-5.7 Safety

- ***Add the following:***

“The Contractor will refer to section, C3.3, Particular Specifications, for the OHSA 1993 Safety Specification.”

- ***Add the following:***

“The Contractor will refer to section, C3.4 Particular Specifications, for the OHSA 1993 Safety Specification”

PSC SITE CLEARANCE

PSC-3 MATERIALS

PSC-3.1 Disposal of Materials

- ***Add the following clause:***

Material obtained from clearing and grubbing shall be disposed of in a designated area of the site. All costs shall be to the contractor's account.

PSD EARTHWORKS

PSD-5 CONSTRUCTION

PSD-5.1 Precautions

PSD-5.1.1 Safety

PSD-5.1.1.2 Safeguarding of excavations

- ***Add the following additional sub items:***

"(g) The Contractor or his agent or his representative shall **not** require or allow any person to work under unsupported overhanging material or in an excavation which is more than 1,5 m deep, and any excavation which has not been adequately supported or braced if there is a danger of the overhanging material or the sides of the excavation collapsing. The support, shoring or bracing to be designed and constructed by the Contractor, shall be strong and sturdy enough to support the sides of the excavation in question."

PSD-5.2 Method and Procedures

PSD-5.2.2 Excavation

PSD-5.2.2.1 Excavations for general earthworks and for structures

- ***Add the following additional sub items:***

"(f) The Contractor shall so plan his cut-to-fill operations that all excavated material is used in the manner that is most appropriate.

The Contractor shall conserve all suitable surplus material, and he shall not borrow, spoil or waste any material unnecessarily. If excavated material designated for a particular purpose become contaminated, is incorrectly used or becomes unavailable through injudicious planning of excavation operations, the Contractor shall replace the contaminated material and make good any shortfall with material of quality at least equal to that of the said selected material.

Where selection of excavated material is required, the method of excavation shall be so arranged as to avoid double handling. Wherever possible excavated material shall be placed in its final position without being stockpiled. If stockpiling is unavoidable, materials intended for different uses shall be stockpiled separately."

PSD-8 MEASUREMENT AND PAYMENT

PSD-8.2 Computation of Quantities

- ***Add the following:***

PSD-8.2.1 Measurement of the bulk earthworks for this contract shall be in cubic metres (m³) calculated by Average End Areas method or Digital Terrain Model (D.T.M.). The measurement shall be based on the total cut volume measured after site clearance and the topsoil has been stripped.

C3.4 : PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract:

C3.4.1 Part AH - OSHA 1993 Safety Specification

C3.4.2 Standard Environmental Management Plan for Civil Engineering Construction Works

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OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

PAM-1: SCOPE

This specification covers the health and safety requirements to be met by the Contractor to ensure a continued safe and healthy environment for all workers, employees and subcontractors under his control and for all other persons entering the site of works.

This specification shall be read with the Occupational Health and Safety Act (Act No 85 and amendment Act No 181) 1993, and the corresponding Construction Regulations 2014, and all other safety codes and specifications referred to in the said Construction Regulations.

In terms of the OHSA Agreement in Section C1.2.4 of the Contract document, the status of the Contractor as mandatory to the Employer (client) is that of an employer in his own right, responsible to comply with all provisions of OHSA 1993 and the Construction Regulations 2014.

This safety specification and the Contractor's own Safety Plan as well as the Construction Regulations 2014, shall be displayed on site or made available for inspection by all workers, employees, inspectors and any other persons entering the site of works.

The following are possible risks associated with this project:

- Potentially dangerous existing services, i.e. gas lines, water and sewerage mains, electrical high voltage cables, on the bridge, buried and overhead,
- Movement of construction vehicles on site, taking into consideration steep slopes, other traffic and existing services,
- Exposure to possible injuries due to mishandling or failure of power and hand tools,
- Risks related to general safety and security on site.

Additional risks may arise from specific methods of construction selected by the Contractor which are not necessarily covered in the above.

PAM-2: DEFINITIONS

For the purpose of this contract the following shall apply:

- (a) **"Employer"** were used in the contract documents and in this specification, means the Employer as defined in the General Conditions of Contract and it shall have the exact same meaning as **"client"** as defined in the Construction Regulations 2014. **"Employer"** and **"client"** are therefore interchangeable and shall be read in the context of the relevant document.
- (b) **"Contractor"**, wherever used in the contract documents and in this specification, shall have the same meaning as **"Contractor"** as defined in the General Conditions of Contract.

In this specification the terms **"principal contractor"** and **"contractor"** are replaced with **"Contractor"** and **"subcontractor"** respectively.

For this contract the **Contractor** will, in terms of OHSA 1993, be the mandatory, without derogating from his status as an employer in his own right.

- (c) **"Engineer"** were used in this specification, means the Engineer as defined in the General Conditions of Contract. In terms of the Construction Regulations the Engineer may act as agent on behalf of the Employer (the client as defined in the Construction Regulations).

PAM-3: APPLICATION FOR CONSTRUCTION WORK PERMIT

The Employer shall at least 30 days before work is to be carried out apply to the Provincial Director of the Department in writing for a construction work permit if the intended works:

- (a) Exceeds 180 days;
- (b) Involves more than 1800 person days;
- (c) The value of the works equals to or exceeds Sixty Million Rands of CIDB grade level 7 or higher.

The application shall be done using form Annexure 1.

PAM-4: TENDERS

The Contractor shall submit the following with his tender:

- (a) a documented Health and Safety Plan as stipulated in Regulation 7 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 2014 and will be subject to approval by the Employer;
- (b) a declaration to the effect that he has the competence and necessary resources to carry out the work safely in compliance with the Construction Regulations 2014;
- (c) a declaration to the effect that he made provision in his tender for the cost of the health and safety measures envisaged in the Construction Regulations.
- (d) Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor will not be able to carry out the work under the contract safely in accordance with the Construction Regulations.

PAM-5: NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION WORK

After award of the contract, but before commencement of construction work, the Contractor shall, in terms of Regulation 3, notify the Provincial Director of the Department of Labour in writing if the following work is involved:

- (a) the demolition of structures and dismantling of fixed plant of height of 3,0 m or more;
- (b) the use of explosives;
- (c) excavation work deeper than 1,0 m; or
- (d) working at a height where there is a risk of falling.

The notification must be done in the form of the Annexure 2 included in the tender document.

A copy of the notification form must be kept on site, available for inspection by inspectors, Employer, Engineer, employees and persons on site.

PAM-6: RISK ASSESSMENT

The Employer shall prepare a baseline risk assessment for the construction project and prepare a site specification Health & Safety specification.

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 7 of the Construction Regulations 2014).

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

PAM-7: APPOINTMENT OF EMPLOYEES AND SUBCONTRACTORS

PAM-7.1 Health and Safety plan

The Contractor shall appoint his employees and any subcontractors to be employed on the contract, in writing, and he shall provide them with a copy of his documented Health and Safety Plan, or relevant sections thereof. The Contractor shall ensure that all subcontractors and employees are committed to the implementation of his Safety Plan.

PAM-7.2 Health and safety induction training

The Contractor shall ensure that all employees under his control, including subcontractors and their employees, undergo a health and safety induction training course by a competent person before commencement of construction work. No visitor or other person shall be allowed or permitted to enter the site of the works unless such person has undergone health and safety training pertaining to hazards prevalent on site.

The Contractor shall ensure that every employee on site shall at all times be in possession of proof of the health and safety induction training issued by a competent person prior to commencement of construction work.

PAM-8: APPOINTMENT OF SAFETY PERSONNEL

PAM-8.1: Construction Supervisor

The Contractor shall appoint a full-time **Construction Supervisor** with the duty of supervising the performance of the construction work.

He may also have to appoint one or more competent employees to assist the construction supervisor where justified by the scope and complexity of the works.

PAM-8.2: Construction safety officer

Taking into consideration the size of the project and the hazards or dangers that can be expected, the Contractor shall appoint in writing a full-time or part-time **Construction Safety Officer** if so decided by the Inspector of the Department of Labour. The Safety Officer shall have the necessary competence and resources to perform his duties diligently.

Provision shall be made by the Contractor in his rates, to cover the cost of this dedicated construction safety officer appointed after award of the contract.

PAM-8.3: Health and safety representatives

In terms of **Sections 17 and 18 of the Act (OHSA 1993)** the Contractor, being the employer in terms of the Act for the execution of the contract, shall appoint a **health and safety representative** whenever he has more than 20 employees in his employment on the site of the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for the workplace shall be at least one for every 100 employees.

The function of the health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular base, to participate in consultations with inspectors and to attend meetings of the health and safety committee.

PAM-8.4: Health and safety committee

In terms of **Sections 17 and 18 of the Act (OHSA 1993)** the Contractor (as employer), shall establish one or more **health and safety committee(s)** where there are two or more health and safety representatives at a workplace. The persons selected by the Contractor to serve on the committee shall be designated in writing.

The function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor and the inspector, and to make recommendations regarding health and safety to the Contractor and to keep record of recommendations and reports made by the committee.

PAM-8.5: Competent persons

In accordance with the Construction Regulations the Contractor has to appoint in writing **competent persons** responsible for supervising construction work on each of the following work situations that may be expected on the site of the works.

- (a) Risk assessment and induction training as described in Regulation 9 of the Construction Regulations;
- (b) Fall protection as described in Regulation 10;
- (c) Structures work as described in Regulation 11;
- (d) Temporary works as described in Regulation 12;
- (e) Excavation work as described in Regulation 13;
- (f) Demolition work as described in Regulation 14;
- (g) Scaffolding work as described in Regulation 16;
- (h) Suspended platform operations as described in Regulation 17;
- (i) Rope access work as described in Regulation 18;
- (j) Material hoist as described in Regulation 19;
- (k) Bulk Mixing Plant as described in Regulation 20;
- (l) Explosive activated fixing device as described in Regulation 21;
- (m) Cranes as described in Regulation 22;
- (n) Construction vehicle and mobile plant inspections on a daily basis by a competent person as described in Regulation 23;
- (o) Electrical installations and mechanisms on construction site as described in Regulation 24;
- (p) Use and storage of flammable liquids on construction site as described in Regulation 25;
- (q) Water Environments as described as Regulation 26;
- (r) Housekeeping and general safeguarding on construction sites as described in Regulation 27;
- (s) Stacking and storage on construction site as described in Regulation 28;
- (t) Fire Precautions as described in Regulation 29; and
- (u) Construction employer facilities as described in Regulation 30.

A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

The appointment of competent persons to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with **all** requirements of the Construction Regulations.

PAM-9: RECORDS AND REGISTERS

In accordance with the Construction Regulations the Contractor is bound to keep records and registers related to health and safety on site for periodic inspection by inspectors, the Engineer, the Employer, trade union officials and subcontractors and employees. The following records and registers must be kept on site and shall be available for inspection at all times.

- (a) A copy of the OHSA 1993 Construction Regulations 2014;
- (b) A copy of this Health and Safety Specification;
- (c) A copy of the Contractor's Health and Safety Plan (Regulation 7);
- (d) A copy of the Notification of Construction Work (Regulation 3);
- (e) A health and safety file in terms of Regulation 5(7) with inputs by the Construction Safety Officer [Regulation 6(7)];
- (f) A copy of the risk assessment described in Regulation 7;
- (g) A full protection plan and the corresponding records of evaluation and training of employees working from elevated positions as described in Regulation 8;
- (h) Drawings pertaining to the design of structures [Regulation 9(3)] and formwork and support work structures [Regulation 10(d)] must be kept on site;
- (i) Pronouncement of the safety of excavations must be recorded in a register to be kept on site [Regulation 11(3)(h)];
- (j) A copy of the certificate of the system design for suspended platforms [Regulation 15(3)];
- (k) A notice must be affixed around the base towers of material hoists to indicate the maximum mass load, which may be carried at any one time by material hoists [Regulation 7(5)].
- (l) Maintenance records of material hoists and inspection results must be kept in a record book to be kept on site [Regulation 17(8)];
- (m) A record of any repairs to or maintenance of a batch plant must be kept on site [Regulation 18(9)];
- (n) A warning notice must be displayed in a conspicuous manner when and wherever an explosive powered tool is used [Regulation 19(2)];
- (o) A register for recording of findings by the competent person appointed to inspect construction vehicles and mobile plant [Regulation 21(1)(j)].

PAM-10: CONTRACTOR'S RESPONSIBILITIES

The Contractor's duties and responsibilities are clearly set out in the Construction Regulations 2003, and are not repeated in detail but some important aspects are highlighted hereafter, without relieving the Contractor of any of his duties and responsibilities in terms of the Construction Regulations.

- (a) Contractor's position in relation to the Employer (Client) (Regulation 4)

In accordance with Section 4 of the Regulations, the Contractor shall liaise closely with the Employer or the Engineer on behalf of the Employer, to ensure that all requirements of the Act and the Regulations are met and complied with.

- (b) The Principal Contractor and Contractor (Regulation 5)

The Contractor is in terms of the definition in Regulation 2(b) the equivalent of Principal Contractor as defined in the Construction Regulations, and he shall comply with all the provisions of Regulation 5.

Any subcontractors employed by the Contractor must be appointed in writing, setting out the terms of the appointment in respect of health and safety. An independent subcontractor shall however provide and demonstrate to the Contractor a suitable, acceptable and sufficiently documented health and safety plan before commencement of the subcontract. In the absence of such a health and safety plan the subcontractor shall undertake in writing that he will comply with the Contractor's safety plan, the health and safety specifications of the Employer and the Construction Regulations 2003.

(c) Supervision of construction work (*Regulation 6*)

The Contractor shall appoint the safety and other personnel and employees as required in terms of Regulation 6 and as set out in paragraph 7 above. Appointment of those personnel and employees does not relieve the Contractor from any of the obligations under Regulation 6.

(d) Risk assessment (*Regulation 7*)

The Contractor shall have the risk assessment made as set out in paragraph 7 above before commencement of the work, and it must be available on site for inspection at all times. The Contractor shall consult with the health and safety committee or health and safety representative(s) etc. on a regular basis to ensure that all employees, including subcontractors under his control, are informed and trained by a competent person regarding health hazards and related work procedures.

No subcontractor, employee or visitor shall be allowed to enter the site of works without prior health and safety induction training, all as specified in Regulation 7.

(e) Fall protection (*Regulation 10*)

Fall protection, if applicable to this contract shall comply in all respects with Regulation 10 of the Construction Regulations.

(f) Structures (*Regulation 11*)

The Contractor will be liable for all claims arising from collapse or failure of structures if he failed to comply with all the specifications, project specifications and drawings related to the structures, unless it can be proved that such collapse or failure can be attributed to faulty design or insufficient design standards on which the specifications and the drawings are based.

In addition the Contractor shall comply with all aspects of Regulation 11 of the Construction Regulations.

(g) Formwork and support work (*Regulation 11*)

The Contractor will be responsible for the adequate design of all formwork and support structures by a competent person.

All drawings pertaining to formwork shall be kept on site and all equipment and materials used in formwork, shall be carefully examined and checked for suitability by a competent person.

The provisions of Regulation 11 of the Construction Regulations shall be followed in every detail.

(h) Excavation work (Regulation 13)

It is essential that the Contractor shall follow the instructions and precautions in the Standard Specifications and Project Specifications as well as the provisions of the Construction Regulations to the letter as unsafe excavations can be a major hazard on any construction site. The Contractor shall therefore ensure that all excavation work is carried out under the supervision of a competent person, that inspections are carried out by a Professional Engineer or Technologist, and that all work is done in such a manner that no hazards are created by unsafe excavations and working conditions.

Supervision by a competent person will not relieve the Contractor from any of his duties and responsibilities under Regulation 13 of the Construction Regulations.

(i) Demolition work (Regulation 14)

Whenever demolition work is included in a contract, the Contractor shall comply with all the requirements of Regulation 14 of the Construction Regulations. The fact that a competent person has to be appointed by the Contractor, does not relieve the Contractor from any of his responsibilities in respect of safety of demolition work.

(j) Scaffolding (Regulation 16)

The Contractor shall ensure that all the provisions of Regulation 16 of the Construction Regulations are complied with. [Note : Reference in the Regulations to "Section 44 of the Act" should read "Section 43 of the Act"]

(k) Suspended platforms (Regulation 17)

Wherever suspended platforms will be necessary on any contract, the Contractor shall ensure that copies of the system design issued by a Professional Engineer are submitted to the Engineer for inspection and checked for design intent only. The Contractor shall appoint competent persons as supervisors and competent scaffold erectors, operators and inspectors and ensure that all work related to suspended platforms are done in accordance with Regulation 17 of the Construction Regulations.

(l) Boatswain's chairs (Regulation 18)

Where boatswain's chairs are required on the construction site, the Contractor shall comply with Regulation 18.

(m) Material Hoists (Regulation 19)

Wherever applicable, the Contractor shall comply with the provisions of Regulation 19 to the letter.

(n) Batch plants (Regulation 20)

Wherever applicable, the Contractor shall ensure that all lifting machines, lifting tackle, conveyors, etc. used in the operation of a batch plant shall comply with, and that all operators, supervisors and employees are strictly held to the provisions of Regulation 20. The Contractor shall ensure that the General Safety Regulations (Government Notice R1031 of 30 May 1986), the Driven Machinery Regulations (Government Notice R295 of 26/2/1988) and the Electrical Installation Regulations (Government Notice R2271 of 11/10/1995) are adhered to by all involved.

In terms of the Regulations, records of repairs and maintenance shall be kept on site.

(o) Explosive powered tools (Regulation 21)

The Contractor shall ensure that, wherever explosive-powered tools are required to be used, all safety provisions of Regulation 21 are complied with.

It is especially important that warning notices are displayed and that the issue and return of cartridges and spent cartridges be recorded in a register to be kept on site.

(p) Cranes (Regulation 22)

Wherever the use of tower cranes becomes necessary, the provisions of Regulation 20 shall be complied with.

(q) Construction vehicles and mobile plant (Regulation 23)

The Contractor shall ensure that all construction vehicles and plants are in good working condition and safe for use, and that they are used in accordance with their design and intended use. The vehicles and plants shall only be operated by workers or operators who have received appropriate training, all in accordance with all the requirements of Regulation 23.

All vehicles and plants must be inspected on a daily basis, prior to use, by a competent person and the findings must be recorded in a register to be kept on site.

(r) Electrical installation and machinery on construction sites (Regulation 24)

The Contractor shall comply with the Electrical Installation Regulations (Government Notice R2920 of 23 October 1992) and the Electrical Machinery Regulations (Government Notice R1953 of 12 August 1993). Before commencement of construction, the Contractor shall take adequate steps to ascertain the presence of, and guard against dangers and hazards due to electrical cables and apparatus under, over or on the site.

All temporary electrical installations on the site shall be under the control of a competent person, without relieving the Contractor of his responsibility for the health and safety of all workers and persons on site in terms of Regulation 24.

(s) Use of temporary storage of flammable liquids on construction sites (Regulation 25)

The Contractor shall comply with the provisions of the General Safety Regulations (Government Notice R1031 of 30 May 1986) and all the provisions of Regulation 25 of the Construction Regulations to ensure a safe and hazard-free environment to all workers and other persons on site.

(t) Water environments (Regulation 26)

Where construction work is done over or in close proximity to water, the provisions of Regulation 26 shall apply.

(u) Housekeeping on Construction sites (Regulation 27)

Housekeeping on all construction sites shall be in accordance with the provisions of the environmental Regulations for workplaces (Government Notice R2281 of 16 October 1987) and all the provisions of Regulation 27 of the Construction Regulations.

(v) Stacking and storage on construction sites (Regulation 28)

The provisions for the stacking of articles contained in the General Safety Regulations (Government Notice R1031 of 30 May 1986) as well as all the provisions of Regulation 28 of the Construction Regulations shall apply.

(w) Fire precautions on construction sites (Regulation 29)

The provisions of the Environmental Regulations for Workplaces (Government Notice R2281 of 16 October 1987) shall apply.

In addition, the necessary precautions shall be taken to prevent the incidence of fires, to provide adequate and sufficient fire protection equipment, sirens, escape routes etc. all in accordance with Regulation 29 of the Construction Regulations.

(x) Construction Employer facilities (Regulation 30)

The Contractor shall comply with the construction site provisions as in the Facilities Regulations (Government Notice R1593 of 12 August 1988) and the provisions of Regulation 30 of the Construction Regulations.

(y) Non-compliance with the Construction Regulations 2014

The foregoing is a summary of parts of the Construction Regulations applicable to all construction projects.

The Contractor, as employer for the execution of the contract, shall ensure that all provisions of the Construction Regulations applicable to the contract under consideration are complied with to the letter.

Should the Contractor fail to comply with the provisions of the Regulations 3 to 32 as listed in Regulation 33, he will be guilty of an offence and will be liable, upon conviction, to the fines or imprisonment as set out in Regulation 33.

The Contractor is advised in his own interest to make a careful study of the Act and the Construction Regulations as ignorance of the Act and the Regulations will not be accepted in any proceedings related to non-conformance to the Act and the Regulations.

PAM-11: MEASUREMENT AND PAYMENT

PAM-11.1: Scheduled Item

Unit

Contractor's obligations in respect of the Occupational Health and Safety Act

Lump Sum

Payment of the lump sum tendered in the Preliminary & General item shall include full compensation for all costs resulting from the Contractor's specified obligations in respect of fulfilling his obligations in respect of the Occupational Health and Safety Act.

Payment of the sum tendered will be made in two instalments, as follows:

The first instalment, 50% of lump sum, will be paid after the Contractor has submitted a Health and Safety plan in accordance with the specifications.

The second instalment, 50% of the lump sum, will be paid after the issuing of the Completion Certificate and the submission of the Health and Safety file.

(a) Safety personnel

The Construction Supervisor, the Construction Safety Officer, Health and Safety Representatives, Health and Safety Committee and Competent Persons referred to in clauses PAM-7.1 to 7.5 shall be members of the Contractor's personnel, and no additional payment will be made for the appointment of such safety personnel.

(b) Records and Registers,

The keeping of health and safety-related records and registers as described in PAM-8 is regarded as a normal duty of the Contractor for which no additional payment will be considered, and which is deemed to be included in the Contractor's tendered rates and prices.

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- 2: RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT**
- 3: TRAINING AND INDUCTION OF EMPLOYEES**
- 4: COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK**
- 5: ENVIRONMENTAL SAFETY**
- 6: MEASUREMENT AND PAYMENT**

ENVIRONMENTAL MANAGEMENT SPECIFICATION

1. PURPOSE

The purpose of the EMP is to encourage good management practices through planning and commitment with respect to environmental issues, and to provide rational and practical environmental guidelines to minimise disturbance of the natural environment.

2. RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The contractor will be responsible for environmental control on site during construction and the maintenance period. The construction activities will be monitored by an independent environmental specialist and audited against the EMP.

3. TRAINING AND INDUCTION OF EMPLOYEES

The contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.).

4. COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK

Any complaints received by the project team from the community will be recorded. The complaint will be brought to the attention of the site manager.

All complaints received will be investigated and a response given to the complainant within 28 days.

All environmental incidents occurring on the site will also be recorded.

5. ENVIRONMENTAL SAFETY

The management of impacts associated with various categories of concern is discussed as separate topics, indicated below.

5.1 Soil

- (a) Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.
- (b) Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.

- (c) Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. The need for such measures will be indicated in the site-specific report.
- (d) Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed.
- (e) Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.
- (f) Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the Project Manager.
- (g) Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds.
- (h) Limited vehicular access is allowed across rocky outcrops and ridges.
- (i) All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete.
- (j) Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized.
- (k) All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired.
- (l) Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods.
- (m) Runoff must be reduced by channelling water into existing surface drainage system.

5.2 Water

- (a) Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of riverbanks or riverbeds takes place.
- (b) Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place.
- (c) All fuel, chemical, oil, etc. spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralize the toxic effects prior to the entry into a water course.

- (d) Oil absorbent fibres must be used to contain oil spilt in water.
- (e) During construction through a wetland, the majority of the flow of the wetland should be allowed to pass downstream.
- (f) Vehicular traffic across wetland areas must be avoided.
- (g) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.
- (h) The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWAF. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWAF.
- (i) No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season.
- (j) No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river without written permission from the Project Manager.
- (k) Disturbances to nesting, breeding and roaming sites of animals in or adjacent to wetland areas must be minimized.

5.3 Air

Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.

Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilization agent. Water used for this purpose must be used in quantities that must not result in the generation of run-off.

The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site specific study must be implemented.

The Contractor must notify the Principal of all schools within 50m of the site of proposed activities. The Principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g. dust clouds may reduce visibility affecting sports activities.

Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.

Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. IAP's must be informed of the excessive noise factors.

The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent land owners.

No loud music is allowed on site and in construction camps.

No fires are allowed if smoke from such fires will cause a nuisance to IAP's.

5.4 Social and Cultural

- (a) Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only.
- (b) The Contractors crew must be easily identifiable due to clothing, identification cards or other methods.
- (c) Rapid migration of job seekers could lead to squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed.
- (d) Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers.
- (e) Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g. the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document.
- (f) No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site.
- (g) The Contractor must provide suitable sanitation facilities for site staff. Sanitation provided during the construction phase should be managed so that it does not cause environmental health problems. The use of the surrounding veld for toilet purposes is not permitted under any circumstance.
- (h) The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure:
 - A basic understanding of the key environmental features of the work site and environments, and
 - Familiarity with the requirements of this document and the site specific report.
- (i) Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document, endanger his/her life or cause him/her to damage the environment.

- (j) The demand for construction materials and supplies will have an effect on the local economy. This impact can be optimised by sourcing and purchasing materials locally and regionally wherever possible, insofar as the material complies with the design specification.
- (k) The Contractor must maintain a detailed complaints register. This must be forwarded, together with solutions, to the authorities when requested.

5.5 Aesthetics

- (a) Scenic Quality

Damage to the natural environment must be minimized.

Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical.

The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield.

No painting or marking of natural features must be allowed.

- (b) All above ground structures could be treated or painted to blend in with the natural environment.
- (c) Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment.
- (d) Natural outcrops, rocky ridges and other natural linear features, must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction.
- (e) Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved to a new construction site.
- (f) Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the Contractor.

5.6 Archaeology and Cultural Sites

- (a) All finds of human remains must be reported to the nearest police station.
- (b) Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).
- (c) Work in areas where artefacts are found must cease immediately.

- (d) Under no circumstances must the Contractor, his/her employees, his/her sub-contractors or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999.
- (e) A fence at least 2 m outside the extremities of the site must be erected to protect archaeological sites.
- (f) All known and identified archaeological and historical sites must be left untouched.
- (g) Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.

5.7 Flora

- (a) All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation.
- (b) The felling and/or cutting of trees and clearing of bush must be minimised.
- (c) Bush must only be cleared to provide essential access for construction purposes.
- (d) The spread of alien vegetation must be minimized.
- (e) Any incident of unauthorised removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor.
- (f) Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding veld so as to provide biomass for other micro-organisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated topsoiled surface. No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such vegetation can be made available to the local inhabitants to be used as firewood.
- (g) No tree outside the footprint of the Works area must be damaged.

5.8 Fauna

- (a) No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed.
- (b) Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee.
- (c) Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes.
- (d) Disturbances to nesting sites of birds must be minimized.
- (e) The Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.

5.9 Infrastructure

- (a) The relevant authorities must be notified of any interruptions of services, especially the Local Municipality, National Road Agency, Spoornet, TELKOM and ESKOM. In addition, care must be taken to avoid damaging major and minor pipelines and other services.
- (b) The integrity of property fences must be maintained.
- (c) No telephone lines must be dropped during the construction operations, except where prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary.
- (d) All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.
- (e) Storage Facilities
 - Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials.
 - The Contractor must ensure that accidental spillage does not pollute soil and water resources.
 - Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources.
 - Cement must be stored and mixed on an impermeable substratum.
- (f) Traffic Control

All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods.

Before any work can start the Local Traffic Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.

- (g) Access Roads

The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes.

Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site.

Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed.

(h) Batching Plants

Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing is complete, all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. Stormwater must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. Operators must wear suitable safety clothing.

(i) Chemical toilet facilities should be managed and serviced by a qualified company. No disposal or leakage of sewerage should occur on or near the site.

(j) Blasting

Blasting must not endanger public or private property.

Noise mufflers and/or soft explosives must be used to minimize the impact on animals.

All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with.

The Contractor must take measures to limit flyrock.

5.10 Safety

- (a) Measures must be taken to prevent any interference that could result in flashover of power lines due to breaching of clearances or the collapse of power lines due to collisions by vehicles and equipment.
- (b) Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes.
- (c) All tall structures must be properly earthed and protected against lightning strikes.
- (d) The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced.
- (e) The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

5.11 Waste

Solid Waste

- (a) Littering on site and the surrounding areas is prohibited.
- (b) Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.
- (c) All bins must be cleaned of litter regularly.
- (d) All waste removed from site must be disposed at a municipal/permitted waste disposal site.
- (e) Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.
- (f) The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.
- (g) Contaminated soil must be treated and disposed of at a permitted waste disposal site, or be removed and the area rehabilitated immediately.
- (h) Waste must be recycled wherever possible.

Liquid Waste

- (a) The Contractor must maintain mobile toilets on site.
- (b) The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.
- (c) All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil.
- (d) All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.

Hazardous Waste

- (a) No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed of at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.
- (b) The Contractor must maintain a hazardous material register.

5.12 Rehabilitation and Site clearance

- (a) When all major construction activities are completed, the site must be inspected to determine site-specific rehabilitation measures. This may be considered as unplanned work e.g. soil rehabilitation due to oil spills.
- (b) All temporary buildings and foundations, equipment, lumber, refuse, surplus materials, waste, construction rubble fencing and other materials foreign to the area must be removed.
- (c) If waste products cannot be recycled, they must be disposed of at a permitted landfill site.
- (d) All drainage deficiencies including abandoned pit latrines and waste pits must be corrected.
- (e) Cut and fill areas must be restored and re-shaped.
- (f) The area must be restored to its natural vegetation condition using indigenous trees, shrubs and grasses as directed by a grassland and/or rehabilitation expert.
- (g) Borrow pits must be re-shaped into even slopes and surfaces to blend with the natural terrain and topsoil must be replaced.
- (h) The grass mix, shrubs and trees used for rehabilitation must be compatible with the species identified in the site-specific investigation.
- (i) Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

6. MEASUREMENT AND PAYMENT

No additional payment will be made to the Contractor to comply with the above actions as it will be deemed to be included in the rates tendered.