

SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION (SAFDA)

CONTRACT NO.: SAFDA-MP-0002 (2022/2023)

APPOINTMENT OF A CONTRACTOR FOR THE REHABILITATION OF MALELANE/NKOMATI SUGARCANE FARMS IRRIGATION INFRASTRUCTURE TO SUPPORT THE OPTIMUM OPERATIONALIZATION OF SUGARCANE FARMS WITHIN NKOMAZI MUNICIPALITY, EHLANZENI DISTRICT PROVINCE

PORTION 2: CONTRACT

PART C3: SCOPE OF WORK

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

SCOPE OF WORK

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C3.1 DESCRIPTION OF THE WORKS

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C3.1 DESCRIPTION OF THE WORKS

3.1.1 Employer's objectives

The employer's objectives are to appoint the Contractor for the rehabilitation of Malalane/Nkomati FPSU's irrigation systems production infrastructure to support the optimum operationalization of sugarcane farms within Nkomazi Municipality, Ehlanzeni District, Mpumalanga Province

3.1.2 Description of the Works

The works to be carried out under this contract comprise of the rehabilitation of Malalane/Nkomati farms irrigation infrastructure to support the optimum operationalization of sugarcane farms within Nkomazi Municipality, Ehlanzeni District, Mpumalanga Province

3.1.3 Extent of the works

The work to be carried out entails:

The contractor shall also undertake the construction process as outlined in the bill of quantity for the completion of the project.

The works shall comprise of the following:

a) Site Establishment: Clear, stripped and grub all plant materials, trees' root and topsoil of existing formation only on designated site where there is any need of new development to take place.

b) Topographical survey: Conduct survey to facilitate runoff planning, bulk earthwork and structure elevation using dumpy level or Total Station where needed.

c) Construction and rehabilitation of on farm irrigation infrastructure inclusive of all the concrete work, steelwork erection, roofing and side cladding, access door & associated sundries.

d) Supply & installation of finishers to the structure including specialist pipes, tanks, tank stands & bases etc.

f) Rehabilitation of plumbing and water supply (connection with mains/pressure line, supply and erection of pressure tanks and connections to buildings);

g) Electrical Installation and providing a certificate of compliance for internal electrification inside the structure.

The description of the works is not necessarily complete and shall not limit the work to be carried out by the Contractor in this contract. Approximate quantities of each type of work are given in the schedule of quantities.

3.1.4 Period of completion of works

The above works in entirety must be completed within the period of 6 **months**. It is therefore the contractor's responsibility to ensure that this will be achieved, failing which penalties will be charged at a rate according to latest document from DPW for **each calendar** day which the contractor falls behind, will be charged until such time that works are completed in full.

3.1.5 Location of the works

The project is located around Tonga area in the Nkomazi Local Municipality, Ehlanzeni District in the Mpumalanga Province. The locality map is attached as Annexure B. **Geographic location:** Latitude 25° 41' 14.2" S, Longitude 31° 46' 49.3" E

3.1.6 Temporary works

Contractor's offices, storage sheds, latrines, barricading of Works shall be located in an approved position and subject to the approval of all authorities concerned. Safety & Security of the contractor's temporary works shall be to his own discretion. The safety of the Employer and Employers representatives will also be the responsibility of the Main Contractor. All reasonable steps should be taken to ensure the safety of all persons on site.

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C3.2 PROJECT SPECIFICATION

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PSL	MEDIUM PRESSURE PIPELINES (SANS 1200 L)
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C3.1: PROJECT SPECIFICATIONS STATUS

The Project Specification, consisting of three parts, forms an integral part of the contract and supplements the Standard Specifications.

Part A contains a general description of the contract Part B covers professional requirements to be met.

Part C contains reference to the standard specifications, variations to the standard specifications and particular specifications.

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PART A: GENERAL

A1. Purpose of Contract

Suitably qualified service providers are invited to tender for on Farm Irrigation Infrastructure rehabilitation contract.

The South African Farmers Development Agency (SAFDA) has established the need for Farm Irrigation Infrastructure rehabilitation as the existing system are aged and delapidated.

The following definitions are applicable to this document:

- Develop & Implement: "Where a single Service Provider acts as the sole point of responsibility to a Client for the development and implementation of a project, on time, within budget and usually in conformance with a performance specification."

A2. Scope of Contract

This contract covers the development, implementation, commissioning and evaluation of irrigation projects of 100ha or less including of all ancillary works like pump stations, water source development, energy source development, water abstraction works, reservoirs, protective covering, minor buildings, roads, fencing and drainage & conservation works. This contract will also be used for the Repair and Maintenance of existing Irrigation Schemes irrespective of the extent of the irrigation scheme. Amongst others are included is soil survey, topographical survey, water resource development and other specialist services such as geotechnical and geo-hydrological investigations.

The preferred service provider is a Company or Joint Venture experienced in irrigation development and construction with CIDB registration 7SH or 7CE and higher, where the other services may be let as sub-contracts to appropriate specialists. In the case of Joint Ventures, at least one of the partners must have a CIDB registration of 7SH or 7CE and higher.

A3. Area of Appointment

Service providers will be appointed to render a service anywhere in the farms located within Nkomazi Municipality, Ehlanzeni District, Mpumalanga Province.

A4. Length of Appointment

The appointment is for a 6-month period. Should the installation of an irrigation scheme be underway when the contract period ends, the SAFDA reserves the right to extend the contract to enable the scheme to be completed.

A5. Professional Responsibility

The professional responsibility for the development, implementation and commissioning will be that of the appointed Service Provider. The traditional separation of responsibilities between service providers is not applicable to this contract. The Service Provider will assume the professional liability for both of the development

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

and implementation of the irrigation project. SAFDA reserves the right to appoint an external service provider for the purpose of monitoring and evaluating the services captured within this contract. SAFDA reserves the right to agree on a specific time frame per project.

A6. Costing Methods

This will be done as follows:

- Development services (Professional)
 - Irrigation design, soil and topographical surveys will be done on an area basis, with a fixed charge component.
 - Development and outsourced services (if not available in-house) will be done on actual cost plus a tendered mark up. (The Service provider should provide 3 quotations from reputable specialists for approval)
 - Other specialist services will be done on proven cost plus a tendered mark up.
- Procurement of materials
 - This will be done on actual cost plus a tendered mark up.
- Installation of equipment
 - This will be based on a tendered rate. With a few exceptions, the rates for installation exclude the cost of material.
- Disbursements and ad-hoc time
 - Disbursement costs are to be built into the various cost items and will not be independently billed. The exception is where the SAFDA instructs in writing that certain actions be undertaken that are not directly related to the work defined in the bill e.g. attending an ad-hoc meeting etc. For this, the bill makes allowance for rates for transport and time.
- The quantities in the Bill of Quantities (BoQ) in this Bid document is only indicative to enable the Department to compare tendered prices. The actual quantities will be determined during the development and implementation stages.

A7. Procurement of materials

The mark up tendered for the procurement must cover all costs related to the purchase of materials and delivery to site, including handling, storage on site, profit, return of faulty items and any other associated costs not covered elsewhere in the bill. The installation thereof is covered elsewhere.

When submitting a price estimate for the installation of an irrigation project, the Service Provider shall supply a bill of quantities based on current cost of materials and equipment and the tendered rates. The cost of materials and equipment shall be based on three written quotations from reputable local suppliers that are acceptable and verifiable by SAFDA, indicating nett prices, which shall be attached to the price estimate. SAFDA reserves the right to request competitive material / equipment quotations.

A8. Pricing and adjudication

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

The bill of materials to be completed as part of this tender requires mainly rates and mark-ups. The rates and mark up tendered by the various bidders will be applied to the detailed bills for a number of different hypothetical irrigation designs, to enable financial adjudication.

A9. Contract price adjustment provision

The tendered rates will be adjusted annually as follows:

- All rates which are based on current market prices with a tendered mark-up will remain unchanged for the duration of the contract.
- All other rates will be adjusted annually as follows:
 - The rates will be adjusted annually by a calculated factor, every 12 calendar months, starting 12 months from the end of the month in which the tender was awarded.
 - The formula is as follows

$$F = (1 - x)(1 + CPI)$$

Where: F = factor x =
0

CPI = Consumer price index: Year on year percentage change, geographic indices for Limpopo province (Statistical release P0141 published by Statistics South Africa - http://www.statssa.gov.za/?page_id=1854&PPN=P0141).

A10. Modus operandi

The SAFDA reserves the right to use any part of the contract in any combination depending on the requirements for the development a specific irrigation project. However, it is envisaged that a development of a typical irrigation system would proceed in the following steps.

- SAFDA provides terms of reference to the Contractor for a project for the development of an irrigation project.
- The Contractor provides a BID including initial site visit, surveys, meetings and resource development based on the tendered rates.
- SAFDA evaluates the BIDS for completeness and alignment with tendered rates.
- On receipt of the order, the Contractor executes the work (Planning) and provides SAFDA with a progress (Planning) report and recommendation (including reports and survey data as specified).
- SAFDA evaluates the reports for completeness.
- After acceptance of the progress report and recommendations, the SAFDA requests a quotation from the same Contractor for the development (Design) of an irrigation project proposal.
- The Contractor provides a quotation based on the tendered rates and the recommendations.
- SAFDA evaluates the BID for completeness and alignment with tendered rates and issue an order.

Contractor

Witness 1

Witness 2

Employer

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- The Contractor provides an irrigation development proposal including a bid for the implementation of the project, based on the tendered rates.
- SAFDA evaluates the proposal and quotation for completeness and alignment with tendered rates.
- SAFDA provides the contractor with an order to execute the implementation of the irrigation project.
- Implementation, Commissioning, handover and retention.

PART B: SPECIFICATIONS FOR PROFESSIONAL SERVICES

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B 1 Irrigation Design**B 1.1 General**

It is intended that the core competency of the Contractor will be in irrigation, both design and installation. Thus this function will not be outsourced but be an in-house competency.

B 1.2 Designer Qualifications

The responsible person for the irrigation design must have proven experience and expertise in the field of irrigation. In addition, the following will be COMPULSARY.

- SABI (SA Besproeiing Instituut) approved designer
- Registration with ECSA as a professional engineer, engineering technologist or engineering technician

B 1.3 Design norms

The following design norms and guidelines must be utilised and will form part of this specification.

B 1.3.1. Norms published by SABI (see section B.3.3 below)

(<http://www.sabi.co.za/designNorms.html>)

B 1.3.2. Irrigation Design Manual (ARC – ILI June 2003 or later)

B 1.3.3. Irrigation User's Manual (ARC – ILI February 2004 or later) B 1.3.4.

Water requirements to be calculated using SAPWAT.

The report and associated SAPWAT 3 (or later version) software can be obtained free of charge from:

The Water Research Commission P/Bag

X03

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Gezina 0031

Tel: 012 33 00340

The details are as follows:

Report number: TT 319/08

Report name: Integrating and upgrading SAPWAT and PLANWAT to create a powerful and user-friendly irrigation and water planning tool.

B 1.3.5. Floppy Irrigation Design.

The design norms published on the website of the company Floppy Sprinkler (Pty) Ltd are to be used as a guideline (<http://www.floppysprinkler.com/>).

B 1.4 SABI design norms.

These norms are reproduced in full below, with minor noted amendments and the addition of a numbering system. Minor grammatical corrections have also been made.

B 1.4.1. General

In South Africa there is a great need for farmers, crop, soil and fertiliser specialists to have information on crop water requirements, nutritional requirements and the scheduling thereof in terms of recommendations for the designer to optimally design an irrigation system for specific circumstances.

A multi- disciplinary approach is required when evaluating water quality for irrigation purposes, so as to identify any anticipated problems with drip systems, the determination of and management of available water sources e.g. boreholes, peak and annual crop water requirements, analysis of soil water holding capacity and infiltration rate.

The designer must highlight any problems e.g. the blockage of drip systems with irrigation water, and make recommendations to solve the envisaged problems.

B 1.4.1.1 Pipe friction in main and sub-main pipelines

The filling up of pipelines and examples of mainline design must be according to industry standards, which must be covered in manuals specific for designers. The designer must take into account the possible effect of water quality on pipes as well as the deterioration of pipes with age during the design process.

The following value for allowable pipe friction in mainlines are proposed as norms: The following applies for pipelines with a diameter of 200mm or smaller:

- Rising pipeline: Maximum 1.5% (m/100m) friction loss Gravity pipeline:
- Maximum allowable flow velocity of 3.0 m/s

If the above figures are exceeded, then the designer must show that the chosen pipe diameter's total cost (capital and annual running cost) have been optimised and is the best of the available options. For pipelines of larger diameter, the effect of water hammer is critical and must be investigated and optimised.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

B 1.4.1.2. Application Efficiencies

These values mentioned are important when used to change nett irrigation requirement to system capacity (gross irrigation requirement). The efficiency of a system is made up of two components, namely the losses that take place between the emitter outlet and before the water reaches the root zone as well as the distribution uniformity (DU) of the total system after operating for a number years. Although there are numerous figures in the literature, there is a lack of reliable figures for South African conditions.

In the interim the following figures are recommended as norms: Drip systems 90%

- Micro sprinkler systems 80% Permanent
- sprinkler systems 75%
- Moving systems 80%
- Movable quick coupling sprinkler systems 70%
- Travelling sprinklers and other moveable sprinkler systems 65% Flood irrigation
- (with piped supply system) 80%
- Flood irrigation (with earth channel supply system) 60% B 1.4.1.3.

Irrigation hours per week

These values are used to determine the required pump -/ stream flow size. The norms recommended by DWAF (1985) are accepted:

- Micro and permanent sprinkler systems - 144 hours Centre
- pivots systems - 144 hours
- Moveable sprinkler and other movable systems - 110 hours Flood
- irrigation systems - 60 hours

Add the following clause to the above:

“The irrigation hours per week in a particular scheme are to be determined in consultation with the client and end user and must take into consideration particular Eskom tariff schemes, which allow for reduced rates when pumping outside of certain peak hours”.

B 1.4.1.4. Minimum pump capacity (safety factor for wear and tear)

These values are added to the calculated system capacity and are used to indicate the duty point (pressure and flow) when selecting a pump.

The present norms are accepted:

- Discharge rate 10%
- Pressure head 5%

Where an irrigation pump is also used for the mixing and application of fertilisers, then an additional 20% pump capacity must be provided for.

B 1.4.1.5. Permissible suction velocities

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

A foot valve's "open" area must be four times larger than that of the open area of the suction hose, thus ensuring that the velocities through the foot valve do not exceed those of the suction hose by more than 25%. The following is proposed:

Suction hose velocity (absolute maximum)-1,5 m/s Add the following clause to the above:

The velocity in the suction line should be in the order of 1 m/s.

Suction strainer velocity- 0,4 m/s

Maximum permissible velocity in a filter bank manifold: 0,5 m/s

Add the following clause to the above:

"The above norm can be exceeded with motivation from the designer."

B 1.4.2. Micro Irrigation

The manufactures' standards for equipment in the industry, for example the minimum back pressure / flow required for the backwash of filters must be adhered to. The choice of equipment, for example a pressure control valve at the inlet of a block, is not part of the norms.

The following norms are recommended:

B 1.4.2.1 Minimum gross application rate

- The present norm for gross application rate of 3mm/h on the wetted area remains unchanged.
- The minimum recommended wetted area norm is scrapped due to management problems in the past, when irrigation controllers were not freely available.

B 1.4.2.2. Filters

- Ring / mesh filter openings must be 1/5 that of the emitter orifice diameter. The appropriate micro emitter manufacturer's recommendations must be used for flow path openings of 1mm.

The following norms are recommended unchanged.

- Maximum allowable pressure drop over ring / mesh filters:
 - Recommended pressure drop over a clean ring filter - 10 kPa
 - Recommended pressure drop over clean filter bank - 30 kPa
 - Maximum allowable pressure drop over a filter bank before backwashing - 70kPa B 1.4.2.3.

Minimum emission uniformity (EU)

- Design EU 90%

The minimum emission uniformity (EU) is used for calculating the available pressure band for the lateral and manifold diameters. The emission uniformity is used to calculate the pressure band, as the maximum design flow

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

variation norm amongst others, does not make provision for the manufactures coefficient of variation (CV) of micro systems.

Each manufacturer of micro sprinklers is responsible to supply the required information (e.g. CV) to designers to determine the pressure band variation.

B 1.4.3. Drip Irrigation

The dripper spacing should be determined through multi-disciplinary collaboration between experts in the agricultural field. As mentioned earlier pressure regulated valves and anti- vacuum valves installed at block inlets do not form part of the norms. The use of specific filter equipment for specific drippers depends on the specific manufacturer's recommendations because research results for sand filters on drip irrigation are not always conclusive. This norm is thus scrapped until such time that relevant research results are available. The following industry specifications for sand filters are recommended:

- A minimum of 50% of the maximum filtration rate (50m³/h per m² sand surface area) is required to backwash the filters. The maximum backwash rate must not exceed 1.2 times the filtration rate. A minimum of 6 m inlet pressure is required during backwashing. The backwash time of sand filters can be between 90 -180 seconds.

Remembering that as the flush process starts, the raw water is above the sand bed, and at first appears to be clean. Thereafter the dirty water, which was trapped in the sand bed, is then expelled. During the flushing process the water will gradually appear cleaner. Thus, it is so important to allow sufficient time during the backwash operation to ensure all impurities are removed from the filter. Pressure compensated drippers are recommended to operate at a maximum of 75% of the allowable pressure of the dripper so as to protect the dripper diaphragm.

The following norms are recommended:

B 1.4.3.1. Filters

When using a sand filter, a 200 mm control mesh- or ring filter must be placed on the downstream side of the sand filter to catch the impurities in case of damage to the sand filter. The drip manufacturer's recommendations must be followed when using a ring / mesh filter.

The present norms should be adjusted as follows (Van Niekerk, 1983): The maximum

- allowable flow rate through a clean sand filter:
 - Flow rate 50 m³/h per m² of with a maximum pressure drop over the sand filter of 10 kPa
- The maximum allowable pressure drop over a sand filter with ring-/ mesh filters:
 - Total pressure drop over a clean filter bank (including sand and ring filter) 40 kPa
 - The maximum allowable pressure difference over the filter bank before backwashing should be 60 kPa
 - When using a ring-/ mesh filter, then the maximum allowable pressure drop norm as described in section 2.2 must be complied with

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

B 1.4.3.2. Minimum emission uniformity (EU) Design EU

90%

The method for calculating pressure band is discussed in detail in the Irrigation Design Manual (2003) edition.

The minimum emission uniformity (EU) is used for calculating the available pressure band for the lateral and manifold diameters.

The emission uniformity is used to calculate the pressure band as the maximum design flow variation norm amongst others does not make provision for the manufactures coefficient of variation (CV) of dripper systems.

Each manufacturer of drippers is responsible to supply the required information (e.g. CV) to designers to calculate the pressure band.

10% Flow variation:

If the dripper you design has a CV of 5% and better, the use of a 10% design flow variation is still acceptable.

As long as you remember that 10% flow variation as norm does not necessarily have the most economic system as a result.

If the CV of the dripper you design for exceeds 5% it will be necessary to use the method referred to in the Irrigation Design Manual (2003). If you don't the flow variation will exceed the 10% norm

B 1.4.3.3. Flow velocity of laterals

A minimum flow velocity of 0.4 m/s at the furthest lateral end point is required. (T- Tape, 1998)

B 1.4.4. Sprinkler Irrigation

During the design stage, especially with moveable sprinkler systems, it is important that the designer can interpret the available water holding capacity and infiltration rate of the soil.

The following norms are proposed:

B 1.4.4.1. Minimum gross application rate Moveable

systems - 5mm/h Permanent systems -
4mm/h

B 1.4.4.2. Maximum pressure variation

20%

B 1.4.4.3. Christiansen uniformity co-efficient (CU)

The CU- value of a specific sprinkler is influenced by the proposed operating pressure and spacing, and will give an indication of the uniformity of water distribution in an irrigation block.

The sprinkler spacing and operating pressure are chosen from a manufacturer's catalogue, bearing in mind the norms applicable to the CU -value.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

The following norms are applicable for wind still conditions: CU 85% for

- vegetable crops
- 75% CU 85% for deep rooted crops e.g. Lucerne CU 70%
- for tree crops
- When applying chemicals through the system, the CU should be 80%.

For windy conditions the following adjustments should be made:

- Wind speed 0 - 5 km/h, reduces the chosen spacing by 10%.
- Wind speed greater than 5 km/h; reduce the chosen spacing by an additional 2.5% for every additional 1.6km/h wind speed.

B 1.4.5. Centre Pivot

The selection of a sprinkler package is a multi - disciplinary process involving the interpretation of the infiltration capabilities of the soil and determination of irrigation requirements.

The choice of specific bandwidths, pressure regulators and electrical motor for specific situations depends on the manufacturer's specifications.

A new index for the evaluation of emitter delivery rate on centre pivots is proposed:

$$Emmitter - CU = 100 \left[1 - \frac{\sum_0^i f_i - q_i}{Q} \right]$$

Where f_i – the actual delivery at outlet i on the centre pivot (l/h) q_i – the design delivery at outlet i (l/h)

$Q = \sum_0^i q_i$ – the design flow rate for the total centre pivot

The following norms are proposed:

- Christiansen uniformity co- efficient (CU)
 - Emitter-CU 95%
- Friction through centre pivot
 - 2.5 % (m/100m) over centre pivot length.
- Effective radius of end gun
 - 75% of the wetted radius of the end gun.

B 1.4.6. Flood Irrigation

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Although flood irrigation appears to be a relatively simple system, it requires various sets of information to ensure a well-designed scheme. The infiltration rate of the soil must be thoroughly investigated and the results thereof taken into account during the planning phase of the system. A runoff control plan must be implemented to ensure that rainwater is kept away from the irrigation area. During the planning phase remember that during construction not more than 20cm of topsoil must be removed during the construction of beds.

The following norms are proposed:

- Slope of beds
 - Slope along the length of the field must be < 0.7% to prevent erosion unless an in situ test is done.
 - The slope across the width must be = 0% for basin and border irrigation.
- Allowable flow depth in beds
 - 50mm flow depth 150mm

B 1.5 Required documentation and outputs

B 1.5.1: The design phase must culminate in a report, including, but not limited to: Description of the proposed scheme

- Scope of the design
- Incorporate the results from all other professional studies (soils survey etc). Design norms
- Scheduling and planning
- Detailed design including (but not limited to)
 - Pump and motor sizing
 - Mainline design
 - Block design
 - Drawing of scheme layout
 - Include irrigation potential map from the soil report.
 - Drawings of irrigation cluster details, if differing substantially from the standard drawings.
 - The entire report, once approved, to be submitted in Adobe Acrobat (pdf) format.
 - A quotation, based on the tendered rates, for the complete installation of the scheme, with time frames.
- All the above to be provided in 4 paper copies, each with a memory stick containing all the data in native electronic format.

B 1.5.2: At construction phase, the following documentation should be provided.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- Minutes of site meeting As built drawings Operation
- manual
- The following must be included in the manual
 - Scheduling information
 - Operational rules
 - Layout drawings
 - Electrical starter panel layout drawing
 - Pump details
- All the above to be provided in 4 paper copies, each with a CD/memory stick containing all the data in native electronic format.

B 1.6 Explanation of payment items for planning and design

The payment items are based on an area with a fixed cost and variable cost component. The fixed cost is the fixed costs of the work, which are independent of the size the area to be designed i.e. transport to site, report and drawings etc. The variable cost will cover items such as the time to complete the work. See par P 1.5.1 for the required outputs. An item making provision for an initial site visit has been inserted in the bill. This will include the cost of travelling and site time.

Items for travelling and time have been allowed for in the bill to cover ad-hoc actions that are authorised by the LDA and which do not fall into the defined payment items. This would mainly include head office meetings, or additional site meetings.

For ad-hoc design work which is not conveniently covered by the payment items in the bill (e.g. design of bulk pipeline), provision is made in the bill for the time based rate for an irrigation designer

The term “authorised company representative” in the bill refers to a person who can make legally binding decision on behalf of the company.

B 1.7 Payment item for professional services during scheme installation

Contract administration, inspection and close out..... Unit: month

This item is to compensate the Contractor for undertaking services that would usually form part of the duties of the Engineer and will only be applicable once the construction phase of the project begins. The sum shall cover all time and disbursement costs incurred by the Contractor to fulfil Stage 5 (Contract Administration and Inspection) and Stage 6 (Close-Out) of the Normal services as defined in the Guideline for Services and Processes for Estimating Fees for Persons Registered in terms of the Engineering Profession Act, 2000 (Act No.46 of 2000), Board Notice 138 of 2015. The typical deliverable are defined in the document, “Government Gazette, Vol.606, 4 December 2015, No. 39480” which can be down loaded from: www.gpwonline.co.za

In addition, the requirements from par B 1.5.2 must be fulfilled.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

B 2 Land (Topographical) Survey B 2.1

Specifications

The responsible person for the land survey must be registered with the South African Council for Professional and Technical Surveyors as a Professional Land Surveyor or Engineering Surveyor.

B 2.1.1 Before any survey work takes place, it is the responsibility of the Contractor to check with the SAFDA for any surveys that may have been undertaken in the past.

B 2.1.2 All data must be geo-referenced to the Hartebeeshoek 1994 system (WGS 1984), referenced to a line of longitude (LO) that corresponds to the mapping published by National Geo-Spatial Information (NGI) of the Department Rural Development and Land Reform (previously Chief Directorate: Surveys and Mapping).

B 2.1.3. The survey should indicate all existing infrastructure and features, including, but not limited to:

- Scheme boundary
- Fences
- Roads
- Existing irrigation infrastructure
- Rivers / water courses / erosion gulleys
- Dams
- Buildings / structures.

B 2.1.4 The digital terrain model (DTM) produced from the survey, must have a vertical (Z) tolerance within the following limits:

Irrigation System	Z tolerance	Typical contour interval
Micro and Drip	150 mm	0.5 m
Sprinkler	300 mm	1.0 m
Pivot / floppy	600 mm	2.0 m

Note: The Z tolerance is the maximum deviation allowed between a spot height taken as a check anywhere in the surveyed area and the height of the same point derived from the DTM.

B 2.1.5. It may be required to do a strip survey of a proposed pipeline route or existing canal.

The specification is as follows:

- Proposed pipeline route: Strip survey 10m wide – DTM Z tolerance as per micro and drip irrigation.
- Existing canal: Survey points spaced every 15 m to 20 m where the canal is straight with a higher density in the bends. Points to be taken on the top of concrete on each side of the canal and one in

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

the middle. All features such as off takes, sluices and long weirs to be captured. In addition, a 10m strip upslope of the canal and 5m strip down slope is to be measured.

Tolerances:

Canal: The following tolerances shall apply to any part of the feature and not on the actual spot it was measured:

- Horizontal accuracy: 100mm
- Vertical accuracy: 25 mm

Strip along canal:

- As per sprinkler irrigation.

B 2.1.6 The surveyor must produce a layout indicating all surveyed infrastructure and features, with contours at an interval appropriate to the irrigation system to be designed and the topography. This must be provided in paper copy and electronic copy in dwg/dxf format. The size of the layout must be A1. The survey must be underlain with the most recent geo- referenced photography from NGI.

B 2.1.7 An ASCII file must be provided with all survey points, including the point description and the X, Y, Z co-ordinates, suitable for a DTM package such as Model Maker, Civil Designer or Civil 3D.

B 2.1.8 A file with the triangle data produced from the survey points must be provided. B 2.1.9 A short report must be submitted in triplicate, including, but not limited to:

- Description of methodology
- Equipment used
- Area covered and number of points taken
- Accuracy and limitations
- Include the layout plan as per par B2.1.6 and provide all electronic data (including the report) on a CD inserted in a pouch attached to the report.

B 2.2 Explanation of payment item

The payment items specify a fixed cost and variable cost component. The fixed cost is the fixed costs of the work, which are independent of the size of the survey i.e. transport to site, production of the report and drawings etc. The variable cost will cover items such as time on site and additional time to complete the work.

Allowance has been made for the fact that adverse field conditions can hamper survey work. Two field conditions are recognised, namely "Farmland / grassland" and "Bushveld / orchards". Farmland / grassland refers to currently or recently cultivated land or open grassland, where the height of vegetative growth is generally less than 1.5 m high i.e. no interference is expected with a tripod mounted instrument or backpack GPS. Bushveld / orchards refer to conditions where the heights of the vegetation will interfere with survey instruments.

The survey also differentiates between the levels of accuracy required for the particular irrigation schemes. The data pertaining to this is found in section B 2.1.2.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

B 3 Soil survey

B 3.1 Specifications

The responsible person for the soil survey must be registered with the South African Council for Natural Scientific Professions as a Certificated or Professional Natural Scientist, practising in Soil Science.

B 3.1.1. Minimum observation density:

- Detailed profile observation on a grid of 100 m x 100 m or 150 m x 150 m depending on terrain, done by auguring or by profile pits if the area is very sandy or stony.
- At least one profile pit sampled for analyses per 50 ha surveyed, or per site.

B 3.1.2. Minimum site properties to be recorded at each observation site:

- Topography and slope
- Micro relief, rockiness, erosion degree and type, flooding hazard etc

B 3.1.3. Minimum soil properties to be recorded

- Soil taxonomic unit
- Presence and depth of any water table and permeability class of underlying material
- Evidence of surface crusting
- Evidence of root and water impeding layers

B 3.1.4. For each horizon, the following should be recorded

- Texture: Field estimate of clay percentage and dominant sand grade
- Soil structure
- Soil colour
- Extent and colour of mottling
- Presence of lime and gypsum
- Mechanical limitations

B 3.1.5. Minimum soil chemical analysis per sample and calculations for assessment of salinity and sodicity.

- Electrical conductivity of the saturation extract (salinity hazard and determination of threshold values for salt sensitive crops)
- Soluble cations (minimum: Na, Ca, and Mg) of the saturation extract to calculate sodium adsorption ration (SAR)
- Soluble anions (minimum: Cl, SO₄) of the saturation extract

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

- pH Water
- Exchangeable cations (minimum: Na, Ca, Mg, and K)
- Cation exchange capacity to calculate exchangeable sodium percentage (ESP)

B 3.1.6. Soil chemical analysis for fertility assessment

- Phosphate status
- Potassium status
- Acidity / alkalinity
- Lime / gypsum requirement
- Additional special crop specific requirements

B 3.1.7. Minimum soil physical property assessment

- Particle size distribution, minimum clay, silt and sand (3-fraction), but preferable 7- fraction analysis.
- Available water capacity
- Soil infiltration rate

B 3.1.8. Water quality assessment

- Electrical conductivity
- Cations: Sodium, Calcium, Magnesium (to calculate SAR), Potassium, and Boron
- Anions: Chloride, Sulphate, Nitrate, Nitrite, and Phosphate
- pH and pHs to calculate the Langelier Index to determine if the water has corrosive or scaling-dissolving tendency on irrigation equipment
- Water class rating and the effect thereof on soils, crops, and irrigation equipment

B 3.1.9. Soil reports and maps (To be provided in 4 paper copies, each with a CD/memory stick containing all the data in native electronic format.)

- **The following should be included in the report (but not limited to)**
 - Summary including major findings and recommendation and a table showing the area (in ha) for each soil and land class.
 - A statement of objectives for the survey A
 - location map
 - Description of the survey procedure
 - Brief description of the geology, climate and vegetation A
 - description of each soil or land class map unit Tabulated
 - properties of soil analysis
 - Summary of irrigation water quality
 - Soil and land class irrigation assessment and recommendations Referencing of source material and a reference list
 - Appendix: Detailed soil description and accompanying detailed soil analyses tables.
- **The following maps are to be produced. Maps are to be produced on a GIS / CAD system.**

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- Soil map
- Irrigation potential map Effective soil depth map
- Clay content (A and B horizon)

B 3.2 Explanation of payment items

The payment items specify a fixed cost and variable cost component. The fixed cost is the fixed costs of the work, which are independent of the size of the soil survey i.e. getting to site, production of the report and drawings etc. The variable cost will cover items such as time on site and additional time to complete the work.

B 4 Other professional services

Other professional services include, but are not limited to, electrical engineering and geo- hydrological services. It is the responsibility of the Contractor to ensure that the proposed professional service providers have proven experience and expertise for the required work. In addition, the Contractor must ensure that they are correctly qualified and registered with the relevant professional bodies.

The Contractor will assume responsibility for all work undertaken by the subcontractors.

Irrespective of the work done, it is essential that part of the service include a report detailing, but not limited to, the brief, the work done, any design work and drawings and a conclusion. Four paper copies must be provided, each with a CD/memory stick containing all the data in native electronic format.

Allowance in the rates must be made for the Contractor to familiarise himself with the report from the specialised sub-contractor and to write a short covering report summarising the findings and recommending a way forward.

Appointment of professional subcontractors will be guided by the following publications from the Construction Industry Development Board (CIDB):

- Best Practise Guideline #D1: Subcontracting Arrangements Practise
- Note #7: Subcontracting Arrangements

Payment will be on proven cost plus a tendered mark up. The SAFDA may require more than one quotation before giving permission for the awarding of the work.

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PART C: AMENDMENTS TO THE STANDARD SPECIFICATIONS STANDARD SPECIFICATIONS**1. APPLICABLE SPECIFICATIONS**

Specifications generally consist of:

- Standard specifications
- Variations to the standard specifications Particular specifications

In this section, the variations to the standard specifications and the particular specifications have been combined into one section.

1.1 Applicable Standard Specification: SANS 1200

The Standard Specification for the IRRIGATION DEVELOPMENT AND MAINTENANCE CONTRACT (the Project), and for all associated civil work, shall be the *SANS 1200 – Standardized Specification for Civil Engineering Construction*, also referred to as “SANS 1200” or “Standard Specifications”.

Irrigation Contractors are warned to fully apprise themselves of the implications of this code.

The Standard Specifications are contained in a separate publication not issued with this volume, and are available at the Contractor's expense from: Standards South Africa.

Office Address:

1 Dr Lategan Road
Groenkloof PRETORIA
Postal Address:

Private Bag X191
PRETORIA 0001

Telephone:

National: 012 428-6883

International: + 27 12 428 6883 Email:

sales@sabs.co.za

The following portions of the *SANS 1200 Standardized Specification for Civil Engineering Construction* shall apply to this Contract. A copy of SANS 1200 and the related SANS 0120 code of practice, which applies equally, shall be kept on Site.

SANS 1200 AA	1986	General (small works)
SANS 1200 AB	1986	Engineer's Office
SANS 1200 C	1980(amended 1990)	Site clearance
SANS 1200 D		Earthworks
SANS 1200 DA	1988(amended 1990)	Earthworks (small works)

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Contract: SAFDA-MP-0002 (2022/2023)

Part C3: Scope of Work

SANS 1200 DB	1989	Earthworks (pipe trenches)
SANS 1200 DK	1996	Gabions and pitching
SANS 1200 G	1982	Concrete (Structural)
SANS 1200 H	1990	Structural steelwork
SANS 1200 HC	1988	Corrosion protection of structural steelwork
SANS 1200 L	1983	Medium-pressure pipelines
SANS 1200 LB	1983	Bedding (pipes)
SANS 1200 LC	1981	Cable Ducts
SANS 1200 LD		Sewers
SANS 1200 LE		Storm-water drainage
SANS 1200 M		Earthworks (roads, subgrade)
SANS 1200 ME		Subbase

The following codes published by SANS shall form part of the specifications

SANS 1011 The installation of polyethylene and poly (vinyl chloride) (PVC-U) and PVC-M pipes 10112:2003

SANS 2001-CT2 2009 Structural timberwork (roofing)

SANS 10396	2003	Implementing Preferential Procurement Procedures	Construction Procurement Policies using Targeted
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HIV/AIDS Awareness

Part 0: Glossary of Terms

11

Witness 2

Part 5: The design, selection and performance of pumping equipment for production boreholes.

Part 6: The installation and commissioning of pumping equipment for production boreholes.

1.3 Variations and Additions to the Standard Specifications

The variations and additions to the Standard Specification that apply to the Project are covered in Section 2: Variations and additions.

Should any requirement of the Variations and Additions conflict with any requirement of the Standard Specification, the requirements of the Variations and Addition shall prevail.

1.4 Particular Project Specifications

Particular project specifications are supplementary specifications that are not covered by the standard specifications. The following Particular Project Specifications, also covered in section 2, shall apply.

PSPS: PUMP AND FILTER STATION

1.5 Equivalency of Codes and Standards

Wherever reference is made in the Contract to specific codes and standards to be met by the materials, plant, and other supplies to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant codes and standards in effect shall apply, unless otherwise expressly stated in the Contract.

The Contractor's attention is drawn to the fact that a publication from Standards South Africa, due to an ongoing internal conversion process at Standards South Africa, may be published under two different reference title numbers. Such two different reference title numbers refer to the same publication, e.g. SABS 1200 and SANS 1200. Such reference title numbers shall be deemed equivalent in accordance with the published equivalence stipulations from Standards South Africa.

2. Variations and Additions

Variations and additions to the SANS 1200 codes as well as particular specification of work not covered by SANS 1200 are detailed in the following sections.

Contents		
Convention for variations and additions to the standard specifications.		C 73
Variation and additions to the standard specifications		C 74
PSAA	GENERAL (SANS 1200 AA)	C 74
PSD	EARTHWORKS (SANS 1200 D)	C 76
PSDB	EARTHWORKS (PIPE TRENCHES) (SANS 1200 DB - 1989)	C 77
PSL	MEDIUM PRESSURE PIPELINES (SANS 1200 L)	C 80

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

PSPS:	PUMP AND FILTER STATION	C 87
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Convention for variations and additions to the standard specifications.

In this section, the number of each clause and each payment item that is an amendment to the Standard 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 or additional clause or payment item that 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' followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the Standard Specifications. Particular specifications (i.e. items not falling under SANS 1200) are prefixed by 'PS' followed by a unique number.

Variation and additions to the standard specifications PSAA GENERAL (SANS 1200 AA)

PSAA 3 MATERIALS

PSAA 3.1 Quality and samples

Add the following to this sub clause:

"All material delivered to the Site shall bear the official standardisation mark, where applicable."

PSAA 5 CONSTRUCTION

PSAA 5.2 Protection of underground services

Add the following to this sub clause:

"The Employer takes no responsibility for the underground services that may be encountered. All cables and pipes shall be considered 'live' unless confirmed otherwise by the relevant service authority. Should the Contractor damage an existing service, the Contractor shall notify the Engineer immediately, who will investigate the matter and determine liability for the damage. The Contractor will be liable for prosecution for wilful or negligent damage to services. Payment for accommodation of services will not be made where no physical accommodation is provided or required, such as in temporary exposure of services during exploratory excavation."

PSAA 5.3 Dealing with water on works

Add the following to this sub clause:

<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

"The Contractor shall provide pumping equipment, pipes and other equipment as necessary." Add the following new sub clause:

"PSAA 5.6 Sanitary facilities

The Contractor shall provide, maintain and finally remove from site adequate sanitary facilities. The sanitary facilities shall be properly ventilated and clean at all times. The use of the sanitary facilities shall be strictly enforced."

PSAA 7 TESTING

PSAA 7.1 Principles

Add the following new sub clause:

"PSAA 7.1.3 Cost of testing

The cost of all testing to be carried out by the Contractor in terms of the requirements of the relevant SANS 1200 standards, shall be included in the rates for the various work items listed in the Bill of Quantities. No separate payments shall be made in this regard.

The Engineer may order the Contractor to arrange special check tests to be carried out by an approved independent laboratory. The cost of special check tests ordered by the Engineer shall be borne by the Employer if the test results indicate compliance with the specification and by the Contractor if the results indicate non-compliance with the specification."

PSAA 8 MEASUREMENT AND PAYMENT PSAA 8.2 PAYMENT

PSAA 8.2.1 Time Related Items

Replace this sub clause with the following:

"The unit for all time related items will be months. Payment for time-related items will be affected only after payment for the relevant fixed-charge item has been made, unless no fixed-charge item exists. Payments will be made monthly as per the tendered rates. However no payment will be made after the contractual period has elapsed unless an extension of time has been approved."

PSAA 8.2 SCHEDULED FIXED-CHARGE AND VALUE RELATED ITEMS

PSAA 8.3.3 General responsibilities and other fixed charge obligations

Add the following sub clause

"PSAA 8.3.3 (a) Complying with Health and Safety Regulations
Unit: Sum

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

The sum shall cover the fixed charged cost incurred by the Contractor to comply with the Health and Safety specifications set by the client. This will include the compilation of all documents, doing assessments, risk analysis etc. as specified.”

PSAA 8.4.3 General responsibilities and other time-related obligations

Add the following sub clauses:

“PSAA 8.3.3(a) Complying with Health and Safety Regulations
Unit: month

The sum shall cover all time related cost incurred by the Contractor to comply with the Health and Safety specifications set by the client. This will include monitoring of the Health and Safety plan, regular safety meetings etc.”

PSD EARTHWORKS (SANS 1200 D) PSD 5 CONSTRUCTION

PSD 5.1.1.1 Barricading and lighting

Add the following to this sub clause:

“Should the Contractor fail to provide adequate lighting, signing and barricading, or leave the Site in a dangerous condition, the Engineer shall be entitled to suspend all work in progress by the Contractor, until in the Engineer’s opinion, the Contractor’s obligation in these respects has been fulfilled; and/or arrange for any emergency work to be carried out by some other agency and to deduct the cost of this work from any monies due to the Contractor.”

PSD 5.1.1.2 Safeguarding of excavations

Add the following to this sub clause:

(g) Loose ground, materials, tools and appliances shall be kept clear of the edge of the excavations and a pathway at least 0.3 m shall be left clear along the edge of the excavation.

The cost of safeguarding of excavations shall be included in the rates for trench excavation.”

PSD 5.1.4.3 Excavated material not to endanger or interfere

Add the following to this sub clause:

“A safe, clear path shall be kept open at all times for pedestrians. Equipment, materials and waste shall be stored, stockpiled or removed in such a manner that pedestrians are not endangered and that the nuisance level is kept to a minimum. If construction activities occupy the whole footway and verge area so that pedestrians are forced to walk in the traffic lane, adequate protection from traffic shall be provided.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Where instructed by the Engineer or where the works impose a danger to traffic or pedestrians, the Contractor shall remove from Site, excavated material to temporary stockpiles and then return to Site, the excavated material for use as backfill or bedding."

*PSDB EARTHWORKS
(PIPE TRENCHES) (SANS 1200 DB -
1989)*

PSDB 3 MATERIALS

PSDB 3.8 Classification of material for hand excavation

Add the following new sub clause:

"PSDB 3.8 Classification of material for hand excavation

Classification of material for various types of hand excavation shall be based on the results of a dynamic cone penetrometer (DCP). The category of material shall be determined by testing the material at regular intervals and at various depths along the centre-line of the trench. A minimum of five tests shall be done at each location and the average number of blows of the tests shall be used to determine the category of material.

The interval between test locations shall be determined by the variation of material type but shall not exceed 50 m. The depth of testing shall be determined by the variation of material type and can increase or decrease in hardness with increasing depth of excavation.

Table PSDB 3.8 indicates the categories:

TABLE PSDB 3.8: CATEGORIES OF MATERIAL FOR HAND EXCAVATION

Category of material for hand excavation	Consistency		DCP blows to penetrate 100 mm	
Description	Granular	Cohesive	Granular	Cohesive
<u>Soft</u> Soft excavation shall be excavation in material that can be efficiently removed from the trench using a pick and shovel but not requiring prior breaking using mechanical equipment such as pavement breakers	Up to medium dense	Firm to stiff	0-6	1-5

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Contract: SAFDA-MP-0002 (2022/2023)
Part C3: Scope of Work
Section C3.1 Description of Works

<u>Intermediate</u> Intermediate excavation shall be excavation in material that requires loosening with a hand spike (gwala) before being removed from the trench	Dense	Stiff to very stiff	7-15	6-8
<u>Hard</u> Hard excavation shall be excavation in material that requires prior breaking using mechanical equipment, such as pavement breakers with clay spades, before being removed from the trench.	Very dense		16-50	-15
<u>Rock</u> Rock excavation shall be excavation in material other than described above which by nature of the material requires prior breaking using mechanical equipment, such as pavement breakers with moil points, before being removed from the trench	-		>50	>15

PSDB 5 CONSTRUCTION

PSDB 5.1.3 Accommodation of Traffic and Access to Properties

Add the following to sub clause 5.1.3 (b):

“The Contractor shall make available on Site at all times a sufficient number of steel plates at least 2,0 m x 2,0 m x 8 mm thick to be laid across open trenches to provide access to private properties. The cost of providing, placing and removing the steel plates shall be included in the rates for trench excavation.”

PSDB 5.4 Excavation

Add the following to this sub clause:

“The total length of open excavation shall not exceed 150 m at any one work site without the Engineer’s written approval. The Contractor will be allowed to work at two work sites at anytime.”

PSDB 5.6.1 General

Add the following after the first paragraph:

“Trenches shall be backfilled level with adjacent surfaces immediately after completion of pipe laying and successful pressure testing. Should pipe laying not be completed before work is due to cease

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

for the day, the Engineer shall be entitled to instruct the Contractor to backfill the trench and re-excavate it the following day in order to complete pipe laying. The cost of the above activity shall be included in the Contractor's rates for excavation."

PSDB 7

TESTING

Add the following new sub clause:

"PSDB 7.2 Inspection at intermediate stages of construction

The Contractor shall call for the Engineer, giving him reasonable notice, to inspect the Works at the following intermediate stages of construction:

- a. After completion of the trench excavation and preparation of the trench bottom and before any pipe is laid.
- b. After the selected backfill material has been placed around the pipe and before the remainder of the trench is backfilled.
- c. Before placing any final surfacing on roads or constructed footways.

Work shall not progress through the specified stages without the approval of the Engineer or his representative on site.

Failure to comply with the provision of this clause may result in the suspension of work for a period as determined by the Engineer. "

PSDB 8

MEASUREMENT AND PAYMENT

PSDB 8.3.1 Site clearance and removal of topsoil

Add the following sub clause:

"d) Place topsoil (150 mm thick) and compact to 90% Mod AASHTO Unit: m²

The rate covers the cost of excavating from stockpiles formed in terms of 8.3.1 c), hauling, and spreading 150 mm thick layer and compaction to 90% Mod AASHTO. Measurement shall be per area covered with compacted topsoil. Also included shall be water diversion humps, 150mm high, spaced at 10m, to prevent erosion of the completed trenches. "

PSDB 8.3.2 Excavation

Add the following to sub clause (a):

"The rate also covers the cost of barricading and lighting, safeguarding of excavations, accommodation of traffic and access to properties. "

PSDB 8.3.4 Particular items

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Replace the heading of sub clause (a) with:

- a) Shore trench due to deep excavation Unit: m

PSDB 8.3.5 Existing services that intersect or adjoin a pipe trench

PSDB 8.3.5 a) Services that intersect a trench

Unit: number

Replace '200 mm' with '500 mm'.

*PSL MEDIUM PRESSURE PIPELINES
(SANS 1200 L) PSL 3 STEEL PIPES,
SPECIALS AND FITTINGS*

PSL 3.4.2 Pipes of nominal bore up to 150mm

Replace this sub clause with the following:

"Steel pipes and fittings of nominal bore up to 150 mm shall be of heavy class complying with the requirements of SANS 62, flanged, shouldered or plain ended as specified. Welded steel shouldered ends shall be to SANS 815."

PSL 3.7.1 uPVC pipes

Delete existing sub clause and replace with:

"All uPVC pipes will be spigot-and-socket-ended conforming to SANS 966 Part 1, sealed with rubber rings to SANS 974. The pressure class of each pipe shall be as specified."

PSL 3.7.2 Polyethylene pipes

Delete existing sub clause and replace with:

"All HDPE pipes shall conform to SANS ISO 4427, material type PE 100. The pressure class of each pipe shall be as specified. The pipe fittings for pipes sized less than 110mm shall be the compression type specially designed for HDPE pipe (Plasson or equivalent).

All LDPE pipes shall conform dimensionally to the withdrawn standard SANS 533-1, type 1 (CID) pipe. The pipe shall have a minimum life of 5 years. The fittings shall be nylon insert fittings secured with clamps. The clamps for on-ground installations shall be the wire screw clamp, nickel coated. Below ground installations shall make use of stainless steel clamps."

PSL 3.9 Corrosion protection

PSL 3.9.2.1 Steel pipes of nominal bore up to 150 mm

Replace this sub clause with the following:

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

"All steel pipes and steel fittings shall be hot dipped galvanised to SANS 121:2011."

PSL 3.9.2.2 Steel pipes of nominal bore over 150 mm

Replace this sub clause with the following:

"All steel pipes and steel fittings shall be hot dipped galvanised to SANS 121:2011."

PSL 3.9.3 Protection against electrolytic corrosion

Replace this sub clause with the following:

"All steel piping and steel fittings installed below ground, in addition to being hot dipped galvanised as in clause PSL 3.9.2.1, shall be fully wrapped with approved protective tape. Protective tape shall comply with the following specification.

Protective Tape

This tape shall be made up of a non-woven synthetic fibre carrier impregnated and coated both sides with a compound incorporating high melting point bitumen (Densotherm or equivalent). During application the tape shall be correctly heated and laps adequately sealed all in accordance with the instructions and recommendations of the supplier.

Before the application of any protective material, the surface of the pipe shall be thoroughly cleaned and all loose or damaged pipe coating removed. All ridges, depressions and steps in the surface shall be filled with an approved filler so as to present a smooth uniform surface.

After the filler has hardened, the entire surface to be wrapped shall be primed with a primer or otherwise treated as recommended by the supplier of the tape.

The protective tape shall be applied as a spiral wrap with not less than 55% overlap. The width of the tape shall be appropriate for the section to be wrapped.

The protective wrapping shall be carried over the pipe coating to the extent that the double protective layer formed by the 55% overlap covers not less than 100 mm of the pipe coating."

PSL 3.10 Valves

Delete the existing sub clause and replace with:

"All valves for installation shall be clockwise closing.

This specification does not necessarily cover every detail of the valves and hydrants to be supplied under the Infrastructure Works and the type or design of any detail not specifically mentioned is left to the discretion of the Contractor, provided that the complete equipment supplied complies with the specification.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Where possible, all valves and hydrants shall comply with the latest SANS specifications.

PSL 3.10.1 Gate Valves

The valves equal to or smaller than 350 mm nominal diameter shall be resilient seal gate valves. The valve bodies, covers, glands and cap tops shall be Spheroidal Graphite cast iron (SG iron).

Valves shall be in accordance with SANS 664: 1989 and bear the SANS mark. Valves shall be drop-tight at all pressures up to working pressure. The seal shall remain drop-tight in the possible event of particles up to a maximum diameter of 2 mm being trapped between the gate and body.

The body shall be flanged at both ends to the specified table and sufficient clearance shall be allowed between the body and the flange to allow the flange bolts to be tightened (refer SAE wrench clearance). A flow direction arrow shall be cast on the body of the valve.

The valves shall be provided with a straight, unobstructed body passage without any pocket and the gate shall be completely clear of the waterway in the fully open position. The sealing and gate guide areas shall be designed to eliminate deposits in the valve body. The gate guides shall be of substantial design to support the gate until the point of closure.

The valve spindle shall be forged from high tensile stainless steel in accordance with BS 970 Gr 431 S29 and shall be of the non-rising type, with facilities to replace the spindle seal (gland packing) under pressure. The spindle seals shall be housed in a corrosion resistant plastic bush.

The operating effort required to operate the valves against 16 bar shall be such that they can be easily operated by one man under all operating conditions.

PSL 3.10.2 Ball Valves

Ball valves shall be the “full bore” type and be in accordance with SANS 1056 part two or part three.

PSL 3.10.3 Butterfly Valves

Butterfly valves shall be of the wafer pattern to be installed between two flanges. The valves shall be fitted with a gearbox with a stainless steel shaft.

PSL 3.10.4 Pressure control valves

Pressure reducing function: The valve shall maintain a pre-set pressure on the downstream side of the valve, providing that the upstream pressure is greater than the pre-set pressure. The valve shall maintain the pre-set pressure in varying flow and pressure conditions.

Pressure sustaining function: The valve shall maintain a minimum pre-set pressure on the upstream side of the valve. Should the upstream pressure exceed the pre-set pressure, the valve shall open completely. The valve shall maintain the minimum pre-set pressure in varying flow and pressure conditions.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Main valve: The main valve shall be a single or double chamber type, manufactured from epoxy coated cast iron or brass. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

Control system: The control system shall consist of a three-way adjustable pilot valve, a three-way cock and all the necessary tubing.

Orifice plate: To be installed in the pressure reducing function, where the pressure ratio required (ratio of upstream pressure to required downstream pressure) exceeds the maximum allowable (usually 3:1). The orifice plates shall be manufactured from steel plate and made to be sandwiched between two flanges. The orifice hole shall be sized to enable the required pressure loss at the given flow rate.

PSL 3.10.5 Air valves

Air valves must operate both ways as specified and when applicable, shall be manufactured to the same standards of quality and finish laid down in SANS 664 for gate valves. Sizes less than 80 mm must, in accordance with SANS 62-1971, have screwed inlets, and larger sizes shall be flanged in accordance with SANS 1123. Built-in isolating valves are not required.

All material must resist corrosion or be coated with a protective layer which is highly resistant to corrosion, such as an epoxy coating of excellent quality. Floats must not lose their shape or leak and shall be able to resist wear as to ensure long life.

Air valves must withstand twice the maximum rated working pressure and ensure a positive drop-tight seal from a minimum pressure of 16 kPa to the maximum working pressure.

The large orifice diameter shall be the same as the nominal diameter of the valve. The small opening must function through the whole range of pressures up to the rated pressure.

PSL 3.10.6 Water meter

PSL 3.10.6.12 Electromagnetic type:

The meter type uses electromagnetic properties rather than mechanical means to measure. The meter will consist of a sensor tube and a remotely wall mounted convertor (display unit).

The sensor tube shall be flanged and lined with a non-corrosive liner. The unit can be battery or mains electricity powered, with a battery life of not less than 12 years. The meter shall be able to measure water flow bi-directionally. The display on the convertor shall show the total flow, the current flow rate and status indication for the battery. The convertor must be earthed as per manufacturers' specification. The protection class shall be IP 68. The signal cable shall be obtained from the supplier of the water meter. The accuracy of the meter must be $\pm 0.3\%$ MV ± 0.5 mm/s, or better.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

The size of meter, power supply and length of cable from the sensor tube to the convertor shall be quoted in the Bill.

PSL 3.10.6.2 Turbine flow meter:

The flow meter shall be the Woltmann type. The body shall be made of cast iron, flanged and drilled to the specified pressure class. The rotor shall be plastic with removable measurement element. The body shall be powder coated. The flow meter shall be constructed such that a pulser can be fitted without breaking the seal.

PSL 5

CONSTRUCTION

PSL 5.1 Laying

PSL 5.1.4 Depth and cover

Add the following to this sub clause:

“5.1.4.6: The minimum cover to finished surface over any buried pipeline shall be 0.8 m. Where a two pipes share a common trench, the minimum cover shall be 0.8m for the uppermost pipe.”

PSL 5.8 Brickwork in chambers and manholes

Add the following to this sub clause:

“The joints of exposed faces shall be flush-trowelled, hard and smooth and shall be rubbed for the full width of the joint as the work proceeds to give a hard polished finish.”

Add the following sub clauses:

SL 8

MEASUREMENT AND PAYMENT

PSL 8.2 Scheduled items

Replace the payment item 8.2.1 and associated sub clause with the following:

“PSL 8.2.1 Lay and Bed Pipes Complete with CouplingsUnit: m

Pipelines will be measured by length over all lengths laid. No deductions will be made for specials and valves. Separate items will be scheduled for each diameter and each type and class of pipe laid. The rates shall cover the costs of the handling, inspecting, transporting, bedding, laying, jointing, cutting, testing and, when relevant, disinfecting of the pipes and the joints.”

Replace the payment item 8.2.21 with the following:

“PSL 8.2.2 Extra over PSL 8.2.1 for the Laying and Bedding of Specials....Unit: number” PSL

8.2.11 Anchor/Thrust blocks and pedestals (including materials)..... Unit: m³

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

Delete the existing sub clause and replace with the following:

“Rate includes the excavation, material, shuttering and placing of class 20/19 concrete as indicated on the drawing. Measurement shall be the volume of concrete indicated on the drawings.”

Add the following sub clauses:

PSL 8.2.16 Trench, lay, bed and backfill pipes complete with couplings
U
nit: metre

The measurement and payment for excavation and backfilling is dealt with in SANS 1200 DB, for laying and bedding in SANS 1200 L and bedding in SANS 1200 LB. This payment item combines all theses operation required to install a buried pipe and is presented as an alternative method of measurement. The supply of the pipe is excluded.

Pipelines will be measured by length over all lengths laid. No deductions will be made for specials and valves. Separate items will be scheduled for each diameter and each type and class of pipe laid The rates shall cover the costs of the handling, inspecting, transporting, bedding, laying, jointing, cutting, testing and, when relevant, disinfecting of the pipes and the joints.”

This item is intended to mainly to deal with in-field piping, where unfavourable trenching conditions are not likely to occur and where soil preparation activities may take place over the buried piping.

PSL 8.2.17 Pipeline markers (including material)
 Unit
: number

The unit of measurement will be the number of markers manufactured and erected. The rate shall include materials, manufacturing, delivery, painting and erection of each unit. The pipeline marker shall be as indicated on the drawings. The markers shall be erected 300 mm off the edge of the pipe trench to the left of the trench and at right angles to the trench centre. Markers shall be installed at all horizontal changes of direction, at both sides of all road and river crossings, at valve chambers and at intervals as agreed with the Engineer (general rule that the previous and next pipe marker shall be visible from any position on the pipe).

PSL 8.2.18 Block valve cluster:
 Unit
: number

The rate shall include the assembly and installation of manifold take-offs, similar to those indicated on the drawing, including the connection to the main line and manifold. The size and type of valve shall be specified.

PSL 8.2.19 Lateral Take-off

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

..... Unit
: number

The rate shall include the assembly and installation of lateral take-offs, similar to those indicated on the drawings, including the connection to the manifold line. It shall be indicated whether there is pressure regulation or not.

PSL 8.2.20 Micro jet lateral pipes
..... Unit
t: metre

The rate shall include the laying and installation of above ground LDPE pipes, including the installation of couplings, reducers, end caps and clamps and connection to the lateral take-off.

PSL 8.2.21 Micro jet unit Unit:
number

The rate shall include the assembly and installation of the micro jet units. Each unit shall consist of the following items, all assembled: Micro jet body with spreader or spinner, nozzle, length of suitable tubing, barbed adaptor and plastic peg. The barbed connector shall be inserted into the crown of the pipe through a hole made by a suitable punch. The plastic peg shall be inserted vertically in the ground and deep enough to support the peg firmly.

PSL 8.2.22 Drip lateral pipes
..... U
nit: metre

The rate shall include the laying and installation of above ground LDPE dripper pipes with integral drippers, including the installation of all couplings, reducers, end caps and clamps and including connection to the manifold take-off. The diameter of the dripper line shall be specified.

PSL 8.2.23 Quick coupling hydrant
..... Unit
: number

The rate shall include the assembly and installation of hydrants, similar to those indicated on the drawings, including the connection to the main line. The size of the hydrant shall be specified.

PSL 8.2.24 Hydrant bend Unit:
number

The rate shall include the assembly and installation of a hydrant bend and quick coupling adaptor, similar to those indicated on the drawings. The size of the hydrant bend shall be specified.

PSL 8.2.25 Above ground manifold / steel quick coupling pipe Unit: m

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

Pipelines will be measured by length over all lengths as laid. No deductions will be made for specials or valves. Separate rates will be scheduled for each diameter and each type. The rate shall cover the cost of the provision of the pipe, and the costs of handling, inspecting, transporting, laying, jointing, cutting and testing of the pipes and joints. The pipe is laid on the soil surface and bedding is thus not applicable. The type, size and diameter of the pipe shall be specified.

In the case of HDPE pipe, the pipe will be cut into suitable lengths (approximately 12m) and jointed, The installation cost of this operation shall be included.

PSL **8.2.26** **Dragline** **unit**
 **Unit**
: number

The rate shall include the assembly and installation of a dragline unit, similar to that indicated on the drawings.

PSL **8.2.27** **Self closing valve assembly**
 **Unit**
: number

The rate shall include the assembly and installation of a self closing valve unit, similar to that indicated on the drawings. The drilling of the hole on the pipe shall be included.

PSL **8.2.28** **Fixed sprinkler on quick coupling pipe**
 **Unit**
: number

The rate shall include the assembly and installation of a fixed sprinkler on quick coupling pipe, similar to that indicated on drawings. The drilling of the hole on the pipe shall be included.

PSL 8.2.29 Removable riser assembly

The rate shall include the assembly and installation of a removable riser assembly, similar to that indicated on drawings.

PSL 8.2.30 Block air relief valve..... **Unit:**
number

The rate shall include the assembly and installation of an air valve on selected block valve clusters. The air valve shall be 25mm plastic body automatic air release anti vacuum. The valve shall be mounted in conjunction with a 25mm full bore ball valve and 25mm galvanised nipple.

PSL 8.2.31 Centre pivot installation

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

All actions necessary to do a complete installation of a centre pivot machine shall be included in this section.

PSL 8.2.31.1 Centre pivot centre (non tow)
 **Unit:**
: number

The rate shall include the installation of the centre pivot centre and connection to the supply line. All labour and equipment shall be included. The installation of the main control panel shall be included. The centre point shall be installed according to the supplier's specifications. The supply of materials for the concrete work shall be included in the price, but all other equipment excluded. The size of the centre shall be specified.

PSL 8.2.32.2 Centre pivot tower **Unit:**
number

The rate shall include the assembly and installation of a complete centre pivot tower and connection to the previous tower or the centre. The installation of electrical cable and control system shall be included, as well as the sprinkler package. The total length and diameter of the tower pipe shall be specified.

PSL 8.2.33.3 Centre pivot overhang **Unit:**
number

The rate shall include the assembly and installation of a complete centre pivot overhang and connection to the previous tower. All labour and equipment shall be included. The installation of electrical cable and control system shall be included, as well as the sprinkler package. The total length and diameter of the overhang shall be specified.

PSL 8.2.34.4 Laying of electrical cable to the centre pivot –in pipe trench.....Unit: metre

The rate shall include the laying of the main armoured electrical supply cable from the power source to the pivot centre. The cost for trenching and backfilling shall be included as part of the pipe laying action. The cable will be laid in the trench at a level between the invert and the crown of the pipe, to the one side of the trench. The cable size shall be indicated.

PSL 8.2.35.5 Step up and step down transformer (pair)..... Unit:
number

Due to the high cost of electric cable, savings can be realised by installing a step up transformer at the power source and a step down transformer at the pivot centre. The rate shall include the cost of installing both transformers as well as the cost of installation of the connection to the power source and the pivot. The measurement shall be the number of transformer pairs.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

PSL 8.2.31 Floppy sprinkler overhead installation**8.2.31.1 Poles****Unit: number**

The rate shall include the installation of the wooden poles on which the cable system is suspended. The diameter and length of the poles shall be specified. The depth of pole in the ground shall be approximately 900 mm.

8.2.31.2 Cable**Unit: metre**

The rate shall include the installation of the overhead cables (excluding the anchors) on the poles. The diameter of the cable shall be specified.

8.2.31.3 Anchors**(including****materials)****Unit: number**

The rate shall include the supply and installation of the anchors. The anchor shall consist of a concrete block, with an eye made of 12mm mild steel rod cast into it. The dimensions shall be approximately 500mm x 500mm x 500mm. The anchor shall be placed 1 meter deep. Also included in this rate is the tensioning of the cable.

8.2.31.4 LDPE**piping****Unit: metre**

The rate shall include the installation of the LDPE piping along the cable and connection to the manifold. The installation of all fittings is included. The LDPE piping shall have a pressure rating of 4 bar and an effective life of not less than eight years.

**8.2.31.5 Floppy sprinkler unit:
number**

The rate shall include the installation of the Floppy sprinkler unit along the LDPE piping. The installation of all associated fittings is included.

*PSPS: PUMP AND FILTER STATION**PSPS 1 SPECIFICATION***PSPS 1.1 CIVIL WORKS PSPS 1.1.1 GENERAL**

The following standard specifications shall apply:

- SANS 1200 G: Concrete
(structural)
- SANS 2001-CM1: Masonry walling
- SANS 10400: The application of the National Building Regulations

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

PSPS 1.1.2.1: Brick Walls

The brick walls shall be a 220 mm thick superstructure wall. The bricks shall be clay face / semi- face bricks to SANS 227, code E, with a minimum strength of 15 MPa. The bond shall be English or Stretcher bond. The bricks shall be placed in class 1 mortar. All jointing shall be concave or vee pointed by recessing the mortar a minimum of 5 mm. All brickwork shall be cleaned of any excess mortar by wire brush and acid wash cleaning as required.

Portion of air bricks shall have a similar specification to, and be laid according to the above. All air brick masonry shall be covered on the inside with expanded sheeting "Mentex", having maximum 8 x 10 mm openings and 2 mm wide x 1 mm thick strands. The sheeting must be secured with 6 mm x 55mm rawl bolts at corners and maximum spacing of 500 mm.

PSPS 1.1.2.2: Brick Reinforcement

Brick reinforcement (brick-force), 150mm wide, shall be installed every third brick layer.

PSPS 1.1.2.3: Lintels

Concrete lintels shall be installed above all doors and windows. The exception to this is where the opening is directly below the concrete roof.

PSPS 1.1.3 Waterproofing

PSPS 1.1.3.1: Damp-proof course for walls

No wall shall be constructed without the appropriate damp-proof course. This shall consist of 375 µm (micron) thick damp-proof course with a width of 220 mm in walls.

PSPS 1.1.3.2: Water-proof sheeting under surface beds

Green waterproof sheeting, 250 µm (micron) thick USB (under surface bed), shall be installed under all surface beds.

PSPS 1.1.4: Metal

work PSPS

1.1.4.1: Door

The door shall consist of a purpose made double steel door frame and double door complete with locking device, built into the wall as indicated on the drawings. All handles, bolts and locks must be included. The door shall make allowance for the crawl beam. The door and frame shall be manufactures from 1.6 mm mild steel. The hinges shall be 100mm heavy duty. The door without the pull handle shall be fitted with lockable bolts, both top and bottom. The rate shall include the supply of two padlocks with a common key. The door and frame shall be painted after installation as follows: 2 x coats of universal undercoat and 2 x coats of white enamel.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

PSPS 1.1.4.2: Crawl Beam

A crawl beam shall be installed, as indicated on the drawings. The crawl beam shall be hot dipped galvanised.

An external support for the crawl beam shall be installed if required. Details are as indicated on the drawings. The support for the crawl beam shall be hot dipped galvanised. A chain block and tackle, suitable for the installed crawl beam shall be supplied and installed. The apparatus shall have a working rating of 1000 kg.

PSPS 1.1.5: Joints

The slip joint between the wall and roof slab shall consist of two layers of three ply malthoid, laid horizontally on a mortar bed on top of the brickwork to form a slip joint between the tops of the walls and underside of the roof slab.

The floor and plinth joint shall consist of two parts grey polysulphide sealant together with 13mm wide x 200 mm deep bituminous impregnated soft board. The polysulphide sealant shall have dimensions of 10 mm wide x 10 mm deep.

PSPS 1.2 MECHANICAL WORKS PSPS 1.2.1 PUMP SPECIFICATION

The pump shall be an end suction centrifugal type. Where possible, the pump and motor shall be close coupled to form an integral unit. Where this is not possible or desirable, the pump and motor shall be mounted on a steel galvanised base plate, coupled with a flexible coupling and equipped with a coupling guard. The pump set shall be capable of operating for 24 hours per day on a continuous basis.

The pump body shall be manufactured from cast iron, epoxy coated. The shaft shall be manufactured from stainless steel. The impeller shall be manufactured from cast iron or bronze.

Full technical details of the pumps and motors selected are to be supplied with tender including pump performance curves.

PSPS 1.2.2 ELECTRIC MOTOR

The electric motor shall be totally enclosed fan cooled to IP 55, with cast iron frame.

The installed power of the motor should exceed the calculated absorbed power by the following margins:

40 %	for pumps requiring up to	5	kW
30%	for pumps requiring from	5 to 10	kW
20%	for pumps requiring from	10 to 30	kW

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

15%	for pumps requiring from	30 to 100	kW
10%	for pumps requiring over	100	kW

A motor which is non-overloading is also deemed acceptable. I.e. the power absorbed by the pump at the extreme end of the performance curve does not exceed the motor rating.

PSPS 1.2.3 DISCHARGE AND SUCTION FITTINGS

Discharge assembly delivery including all pipe work in galvanized steel, flow meters and non- return and isolating valves, shall be provided as shown on drawing 16933RW-104.

- All discharge fittings, valves and meters to have a minimum pressure rating of 1000 kPa.
- Steel piping up to 150mm ND to conform to SANS 62-1, heavy duty and be hot dipped galvanised.
- Steel piping above 150mm ND to conform to SANS 719 with minimum wall thickness 4.5mm and be hot dipped galvanised.
- All screwed pieces and pipe fittings to conform to SANS 62-2.
- Flanges: All flanges shall conform to Table D, except at the pump flanges.
- All manufactured fittings shall be hot dipped galvanised according to SANS ISO 1461.
- Bolts and Nuts: Bolts and nuts shall be hexagon head type complying with SANS 1700, metric threads. They shall be hot dipped galvanized according to SANS ISO 1461.
- All below ground galvanised steel pipes and fittings shall be wrapped as specified in PSL 3.9.3.

PSPS 1.2.4 PUMP INLET PIPING

The fittings leading into the pump suction shall be an eccentric reducer followed by a straight piece of pipe of the same nominal diameter (ND) as the pump suction. The configuration is indicated on the drawings. The lengths shall be as follows:

- Eccentric reducer: Length = $4 \times (D1 - D2)$
- Straight pipe: Length = $2 \times D2$

where $D1=ND$ of pump suction and $D2=ND$ of pump inlet.

PSPS1.2.5: PRESSURE GAUGE

The pressure gauge shall be glycerine filled and designed for heavy duty applications. The gauge shall comply with SANS 1062. Dial size shall be 63 mm and the connection shall be ¼" NPT. The scale shall be 12 bar, with an accuracy of $\pm 1, 6\%$ of full scale dial. The case shall be made of stainless steel 304 and the window shall be of extruded acrylic sheet. A vacuum gauge shall be

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

placed on the suction line where a non-flooded suction scenario exists. This shall be capable of reading pressure below atmospheric. The scale shall be 0 to -1 bar.

PSPS 1.2.6: IDENTIFICATION PLATE

A metal identification plate shall be attached to the outside of the control panel giving information on each pump: pump make and model, serial no, speed (rpm), delivery (m³/hr) and head (kPa).

PSPS 1.2.7 FILTRATION

PSPS 1.2.7.1 DISC FILTER

The filter shall be equipped with plastic filtering discs made from polypropylene or another suitable material, grooved both sides. The filter body shall be constructed of mild steel, epoxy coated or hot dipped galvanised. Where appropriate, filters with plastic bodies may be utilised. As per SABI norms, the maximum clean water loss over a disc filter shall be 10 kPa.

PSPS 1.2.7.2 SAND FILTER

Sand filters are primarily used for drip irrigation. The filter medium shall be suitably graded silica sand to provide a filtering fineness equivalent to 80 micron. The filter body shall be constructed of mild steel, epoxy coated or hot dipped galvanised. When utilised for drip irrigation, each sand filter must be followed by a mesh or disc filter with 200 micron filtering capacity. As per SABI norms, the maximum clean water loss over a sand filter is 10 kPa, with a maximum flow rate of 50 m³/hr/m² of filter area.

PSPS 1.2.7.3 FILTER BANK

Filter banks shall be consisting of individual filters on a common inlet and outlet manifold. The number of individual filters on a bank should not be less than three, unless otherwise motivated. The material of construction of the manifolds shall be mild steel, hot dipped galvanised or epoxy coated. Manifolds constructed of HDPE will be acceptable. The sizing of the various components of filter banks shall be according to the prescribed norms. As per SABI norms, the maximum clean water loss over a filter bank is 30 kPa and the maximum allowable pressure drop before backwashing is 70 kPa. The filter bank shall be equipped with a timer panel and all the necessary hydraulic valves, solenoids and relays to enable automatic back wash of the filters. The timer panel shall have the following adjustable time settings:

- Time between back
- wash events Time for
- each filter to back wash.

Filters control units which flush on differential pressure are also acceptable. Full technical details of the filter banks selected are to be supplied with tender, including friction data.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

PSPS 1.3 ELECTRICAL WORKS PSPS 1.3.1 GENERAL

As a general rule, the electrical work covers the design and installation of the following: Application

- for, or upgrading of an ESKOM transformer
- 400 V cable supply from the transformer to the pump station
- Pump control panel
- General electrical installation for pump station including lights and power outlets
- Connection of the pump motors to the control panels
- Level controls (if necessary)
- Arrangement for switching on of the power with
- Eskom Testing and commissioning of the installation.

PSPS 1.3.2 QUALIFICATION OF PERSONNEL

Due to the relatively small size of the installations covered in this contract, it is not expected that the services of an electrical engineer will be required. However, provision has been made for this service in the bill of materials and may be utilised subject to suitable motivation being provided and permission being granted by the client. It is important that electrical work at the pump station be supervised by a suitably qualified person. The person issuing the Electrical

Certificate of Compliance must be registered with the Department of Labour as an Installation Electrician or Master Installation Electrician and be registered with the Electrical Contracting Board of South Africa.

PSPS 1.3.3 ELECTRICAL CABLES

All electric cable external to the starter panel shall be 4 core PVC/SWA to SANS 1507. Where buried, the cable must have a cover of 0.8 m, with 100 mm bedding above and below the cable. The cable shall be sized in accordance with SANS 10142.

PSPS 1.3.4 ELECTRICAL CONTROL PANEL

The control panel shall be enclosed in a suitably sized, wall mounted steel cabinet, painted or galvanised, with protection rating IP 54. This shall be mounted within the pump house. The following components and features shall be included:

- Motor Starting: Usually by means of a Star/Delta starter. Earthing
- : Earth leakage protection for the board and motor.
- Contactor : Electromagnetic switch selected for a particular size of motor,

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

- Protection : Protect the motor against: overload, under load, phase failure, phase reversal, low / high voltage and locked rotor.
- Isolator : Isolating the circuit for maintenance or replacement of the motor, or disconnection of the pump from the system,
- Surge arrestor: Protecting the motor and control panel against surges in the supply line
- Indicator lights: Displaying status of the motor: "Run", "Stop", "Trip" and "No Flow" Power indicator Voltmeter on incoming power and ammeter for the pump.
- Timer: Run time display

Indicator lights

The following indicator lights shall be fitted externally on the panel door

- Pump run : Green
- Pump stop : Red
- Pump tripped: White

PSPS 1.3.5 ELECTRICAL COMPLIANCE

The Contractor shall provide an Electrical Compliance Certificate for all the electrical installations at the pump stations in terms of the Occupational Health and Safety Act (No 85 of 1993).

PSPS 1.4 COMMISSIONING AND TESTING

After the equipment has been installed on site, tests shall be carried out to prove the correct functioning of the pumps and ancillary equipment.

PSPS 1.5 MANUAL

The Contractor shall supply 4 sets of operation and maintenance manuals for the pump station. This shall include the following:

- The complete plant technical data of each item of equipment (e.g. manufacturers name and address, type and size of unit, serial number, motor details, unit performance and duty details).
- Detailed description of the operating procedures necessary for starting up, running and shutting down the pumps. This shall include the control panel starter and any alarm and safety interlocks as identified on the control panels.
- Maintenance operations on a daily, weekly, monthly etc basis for each item of plant. The preparation of this section shall be carried out by obtaining from the manufacturer his advice and recommendations for lubrication, adjustment and routine maintenance.
- Test certificates, compliance certificate and commissioning report. Copies of the pump curves with the duty points clearly indicated.

PSPS 2 PAYMENT ITEMS

PSPS 2.1: Pump House (including all materials)..... Unit:
number

The rate shall include the construction of the entire enclosure as shown on the drawings, including the concrete floor slab and pump plinths. The supply of materials is included in this item.

PSPS 2.2: Pump and Filter House (including all materials)

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

..... Unit
: number

The rate shall include the construction of the entire enclosure as shown on drawings, including the concrete floor slab and pump plinths. The supply of materials is included in this item.

PSPS 2.3: Borehole Pump Housing (including all materials)..... Unit:
number

The rate shall include the construction of the entire enclosure as shown on drawings. This includes the steel cage and the concrete surrounds. The supply of materials is included in this item.

PSPS 2.4: Pump and motor sets Unit:
number

The rate shall include the sizing, selection, assembly and installation of the pump and motor set. Measurement shall be per number of pumps with motors installed. Payment shall be made on the successful testing and commissioning of the installations and on approval by the Engineer. The coupling system shall be specified.

PSPS 2.5: Suction piping Unit:
number

The rate shall include the assembly and installation of all piping, fittings, valves, water meters, pressure gauges, plinths and thrust blocks from the foot valve to the suction inlet of the pump as indicated on the drawings. The concrete required for the plinths and thrust blocks is included. The nominal size of the piping shall be indicated.

PSPS 2.6: Deliver piping -no filter Unit:
number

The rate shall include the assembly and installation of all piping, fittings, valves, water meters, pressure gauges, plinths and thrust blocks from the connection to the fixed pump outlet up to and including the flange adaptor to connect to the rising main, as indicated on the drawings. The concrete required for the plinths and thrust blocks is included. The nominal size of the piping shall be indicated.

PSPS 2.7: Deliver piping - with filter Unit:
number

The rate shall include the assembly and installation of all piping, fittings, valves, water meters, pressure gauges, plinths and thrust blocks from the connection to the fixed pump outlet up to and including the flange adaptor to connect to the rising main, as indicated on the drawings.

The concrete required for the plinths and thrust blocks is included. The nominal size of the piping shall be indicated

PSPS 2.8: Filter bank

..... Unit
: Number

The rate shall cover the assembly and installation of the filter bank, complete with inlet and outlet manifolds. Also included is the flushing manifold, with piping to convey the waste water outside of

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

the pump station. The type, number and size of filters shall be specified. The connecting piping to the pump and rising main is covered elsewhere.

PSPS 2.9: Electrical cable

The rate shall include the installation of suitably sized 4 core armoured cable. The cable shall include the connection to the transformer, the pump starters and the pump motors. Cable mounted against the walls and roof must be installed on medium duty galvanised cable ladder. Where crossing the floor, the cable must be protected by steel wiring channels or steel conduits.

Underground cable shall be buried with a minimum cover of 0.8m. The underground installation of cable includes trenching, bedding and backfilling, with separate copper earth wire strapped to the cable at 1.5 m intervals. Cable mounted against walls must be installed on medium duty galvanised cable ladder.

PSPS 2.9.1 Underground electrical cable

.....U
Unit: metre

PSPS 2.9.2 Above ground electrical cable

.....Un
Unit: metre

PSPS 2.10: Starter Panel and Ancillaries

.....Unit
Unit: Number

The rate shall include the design, build, supply, installation and testing (in situ with the entire system) of the starter panel as specified. The identification plate as specified shall be included.

PSPS 2.11: Connection to Eskom transformer

.....
Unit: Sum

The rate shall include the time related costs of arranging and undertaking the Eskom connection.

PSPS 2.12: Compliance Certificate Unit: Number

The rate shall include the completion of an electrical compliance certificate by a suitable qualified person.

PSPS 2.13: Operation and Maintenance Manual Unit: Number

The rate shall cover the compilation and submission of manuals as specified.

PSPS 2.14: Commissioning and Testing

.....Unit
Unit: Number

The cost of commissioning and testing of the pump station shall be included in rates of the relevant Payment Items.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

**SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION
(SAFDA)**

CONTRACT NO.: SAFDA-MP-0002 (2022/2023)

**APPOINTMENT OF A CONTRACTOR FOR THE
REHABILITATION OF MALELANE/NKOMATI SUGARCANE
FARMS IRRIGATION INFRASTRUCTURE TO SUPPORT THE
OPTIMUM OPERATIONALIZATION OF SUGARCANE FARMS
WITHIN NKOMAZI MUNICIPALITY, EHLANZENI DISTRICT
PROVINCE**

C3.2 ENGINEERING

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

C3.2 ENGINEERING

C3.2.1 LIST OF DRAWINGS

Drawings Prepared and to be issued to Contractor

**To be issued by the contractor: LAYOUT PLAN FOR EACH FARM DEVELOPMENT
PREPARED BY THE CONSULTING ENGINEER**

Drawings Prepared by the Employer

To be issued to the preferred contractor : NONE

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION (SAFDA)

CONTRACT NO.: SAFDA-MP-0002 (2022/2023)

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OPTIMUM OPERATIONALIZATION OF SUGARCANE FARMS
WITHIN NKOMAZI MUNICIPALITY, EHLANZENI DISTRICT
PROVINCE**

C3.3 PROCUREMENT

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

C3.3 PROCUREMENT

C3.3.1 PREFERENTIAL PROCUREMENT PROCEDURES

The Preference Points Scoring system will be applied as indicated in Part T.2.2.8

C3.3.2 COMMUNITY LIAISON OFFICER

It is the requirement of the Contract that a Community Liaison Officer (CLO) be appointed by the Contractor. The primary functions of the CLO shall be to assist the Contractor with the selection and recruitment of targeted labour, to represent the community in matters concerning the use of targeted labour (and/or enterprises) on the works, and to assist with the communication between the Contractor, the Client and the local community.

The Contractor shall appoint the CLO as per the recruitment method approved by the Employer. The candidates must have a minimum of Grade 12 qualification with the ability to read and write. The candidates should reside in the community of Tonga Village, Nkomazi Local Municipality.

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SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION (SAFDA)

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**APPOINTMENT OF A CONTRACTOR FOR THE
REHABILITATION OF MALELANE/NKOMATI SUGARCANE
FARMS IRRIGATION INFRASTRUCTURE TO SUPPORT THE
OPTIMUM OPERATIONALIZATION OF SUGARCANE FARMS
WITHIN NKOMAZI MUNICIPALITY, EHLANZENI DISTRICT
PROVINCE**

C3.4 CONSTRUCTION

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

C 3.4.1 CONSTRUCTION STANDARDS

The standard specifications on which this contract is based are the **SANS 1200 Standardised Specification for Civil Engineering Construction (Edition 3)**.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

SOUTH AFRICAN FARMERS DEVELOPMENT ASSOCIATION (SAFDA)

CONTRACT NO.: SAFDA-MP-0002 (2022/2023)

**APPOINTMENT OF A CONTRACTOR FOR THE
REHABILITATION OF MALELANE/NKOMATI SUGARCANE
FARMS IRRIGATION INFRASTRUCTURE TO SUPPORT THE
OPTIMUM OPERATIONALIZATION OF SUGARCANE FARMS
WITHIN NKOMAZI MUNICIPALITY, EHLANZENI DISTRICT
PROVINCE**

C3.5 MANAGEMENT

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

C3.5.1 PLANNING AND PROGRAMMING

1. Planning and Programming

The Contractor is required to commence with execution of the Works within 14 days from the date of handover.

The programme shall include details of anticipated monthly expenditures based on the programme and shall be in the form of a bar chart with a calendar week as the time scale. The programme shall itemise key construction activities and indicate their duration, weekly production rates and their relation to other activities thereby defining a critical path to the Due Completion Date. The monthly expenditures shall be the net value of construction and shall not include contingencies and VAT.

The programme shall make allowance for all gazetted holidays, builder's break and rain. The Contractor shall table an updated copy of the approved programme at each site meeting clearly indicating the actual progress versus the scheduled progress.

2. Payment Certificates

Measurements will be done continuously between the Client's Representatives and the Contractor on dates and time agreed on. These parties must arrange dates.

The progress of the following items will be recorded hereunder:

The contractor will provide a concept with quantities to the Client. If any material on site is claimed, proof of ownership must be provided either by means of the necessary receipts or a letter from the supplier stating that ownership has been transferred to the contractor upon delivery.

After the payment certificate has been approved by the Client, the contractor must issue a VAT invoice. The certificate will then be ready for handing in.

Payment certificates must be completed monthly and submitted before each site meeting, to ensure that percentage progress can be ready for the site meeting each month.

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C.3.5.2 HEALTH AND SAFETY

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Contractor

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Employer

Witness 1

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ANNEXURES

Annexure 1 Appointment letters

- 1.1 Appointment of Assistant Construction Supervisor
- 1.2 Appointment of Construction Site Health and Safety Officer
- 1.3 Appointment of Construction Vehicle and Mobile Plant Inspector
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- 1.6 Appointment of Excavation Work Supervisor
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- 1.8 Appointment of Ladder Inspector
- 1.9 Appointment of Risk Assessor
- 1.10 Appointment of Scaffolding Supervisor
- 1.11 Appointment of Stacking Supervisor

Annexure 2 Notification Templates

- 2.1 Notification for Construction Work

Annexure 3 Identified Health and Safety Hazards

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS: HEALTH AND SAFETY SPECIFICATION

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 tunnelling although the minimum requirements for tunnelling 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.

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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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 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.

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 4.5.2, 4.6, 4.7 and 4.8 of the Contract Data.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- 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 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- 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.
 - (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
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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.
- 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 4.6 of the Contract Data, 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.
- 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- 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.
- 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.
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) Analyse ergonomic related hazards and address the same in the risk assessment.
7. (7) Ensure that all employees undergo health and safety induction prior to

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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 4.6 of the Contract Data, 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.

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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- 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.
- 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 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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,
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 fulfil 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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 fulfil 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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 matter 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 Works to ensure compliance with

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

regulation 10 of the Construction 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 SABS 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.

3. GENERAL REQUIREMENTS OF HEALTH AND SAFETY PLAN

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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

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,

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- 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

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,

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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 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*

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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
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,

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

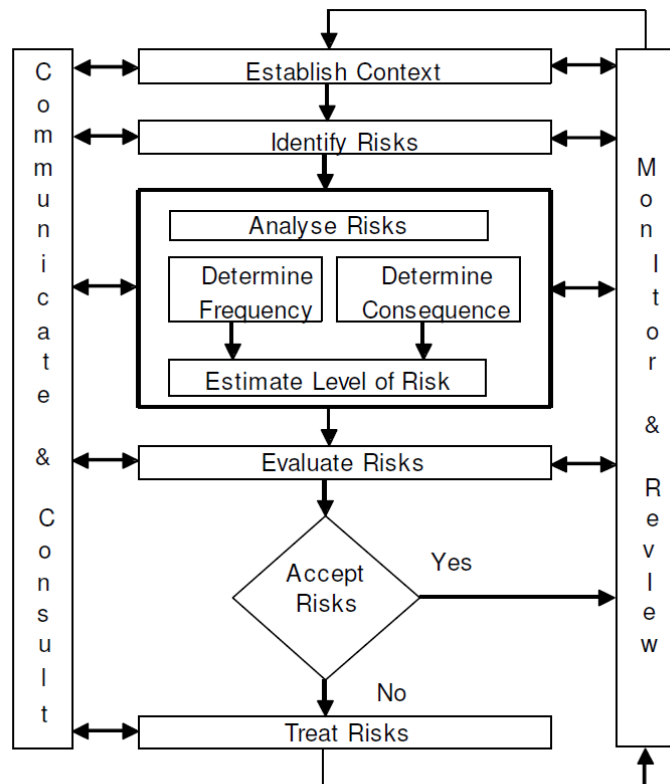


Figure 1: Risk Management Process

The Contractor shall ensure that the risk assessment compiled as part of his Health and Safety Plan contains at least these items.

4.4.2 Risk Identification

The Contractor should regard this step of the risk assessment as the most important. Subsequent analysis and evaluation of risks and the development of risk control measures are wasted if the risks or hazards on the Works are not carefully identified.

The Contractor should bear the following principles in mind when identifying the risks:

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

- i) Systematically address all risks or hazards on the Works,
- ii) Review all aspects of the work, but consider only those that have a potential to cause harm,
- iii) Rank the risks identified in order of importance and then use appropriately advanced techniques to deal with major risks,
- iv) Deal mainly with major risks and don't obscure these with unimportant information, especially minor risks,
- v) Address what actually happens in the workplace during the work activity
- vi) Consider all persons that may be affected,
- 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 below.

Frequency of Occurrence of Hazard	Severity of Consequences of Potential Hazard					
	1 Medically treatable	1 Compensable	1 0 Com	1 Permanently disabling	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	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	Low	Low	Low	Medium-low	Medium	High

Figure 2: Compounded Risk Matrix

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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, albe they 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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, 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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 may 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 to 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 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.

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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,

<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Contractor	<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Witness 1	<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Witness 2	<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Employer	<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Witness 1	<div style="border: 1px solid black; width: 100px; height: 20px; margin-bottom: 5px;"></div> Witness 2
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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.

5.2.4 Physical and Psychological Fitness

Were required by the Occupational Health & Safety Act and its regulations the contractor shall ensure that his employees are in possession of a valid medical certificate of fitness to work in such an environment.

In terms of the Construction Regulations 2003 medical certificates of fitness are required for persons working at elevated positions (Regulation 8(2)(b)), persons working on suspended platforms (Regulation 15(12)a) tower crane operators (Regulation 20 (g)) and construction vehicle and mobile plant operators (Regulation 21 (1)(d)(ii)).

5.3 Plant, Vehicles and Equipment

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 SABS 1808 and SABS 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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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
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:

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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,
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:

- o Of acceptable design and construction,
- o Maintained and in good working order,
- o Used according to design specifications, and
- o 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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.

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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 SABS 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.

6.5 Stacking and storage

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

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 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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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

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

- o Store and/or stack materials,
- o Remove debris from site,
- o Prevent unauthorized entrance to the site
- o 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).

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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:

- 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,

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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.

7.1.8 Hazardous Chemical Substances

The Contractor will be required to adhere to the Regulations for Hazardous Chemical Substances 1995 as amended in the handling and storage cement of and other hazardous chemical substances.

The Contractor must discuss the following in detail in his safety plan in respect of each hazardous chemical substance that will be used in the works:

- Storage of substance
- Handling of substance
- Protective clothing and other devices to be used while handling the substance
- Medical surveillance.

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

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
- Dust control measures
- Noise control measures

7.3 Earthworks

The Contractor shall, without limiting his obligations, cover at least the following matters

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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:

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.

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

permitted to use, and

The precautionary measures which should be taken regarding the above.

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

What proof of induction training will be carried by his employees (e.g. laminated type identification card).

8.5 Safety Meetings

The Contractor shall conduct at least one formal safety meeting per month with his employees to ensure safety awareness and shall maintain appropriate records of attendance and meeting content. Such records shall be made available to the Employers Safety Agent. Such meetings shall address at least the following:

Accident / safety incidents

Hazardous conditions

Hazardous materials / substances

Job or work projections

Work procedures

Protective clothing / equipment

Housekeeping

General safety topics

8.6 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:

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

The Employer or his Safety Agent,
The Employer's Occupational Safety Officer, 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.

The Employer, his Safety Agent or his Occupational Safety Officer may stop the work at any time under the following conditions:

If the Contractor is not compliant with his Health and Safety Plan Imminent threat to the health and safety of any person on site Continuous non-conformance to corrective action requests.

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.

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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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
- 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.

10. MEASUREMENT AND PAYMENT

10.1 Measurement and Payment

10.1.1 The scheduled items for health and safety will be as specified in clause 31 of section 001 of the Standard Specifications.

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.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

ANNEXURE 1

APPOINTMENT LETTERS PRO-FORMA'S

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: (*Assistant Construction Supervisor's Name*)

APPOINTMENT OF THE ASSISTANT CONSTRUCTION SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 6(2)

I, (*contractor's name*) hereby appoint (*assistant construction supervisor's name*) as the assistant supervisor responsible for (*site address*) to carry out the construction work of (*description of construction work and area of responsibility*).

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all persons are aware and understand the hazards attached to the work being carried out;
3. That the required risk assessments are carried out;
4. That precautionary measures are identified and implemented;
5. That discipline is enforced at the construction site at all times;
6. That all identified statutory requirements are met; and
7. That any other interest in terms of health and safety with respect to the responsible area is met.
8. You will accept the duties of the Construction Supervisor in his absence.

You are required to report any deviations of the above-mentioned instruction to (*construction supervisor's name*) and in his absence to the contractor's representative.

This appointment is valid from (*date*) to the completion of the stipulated construction work.

You shall submit a written weekly report any non-compliance with the construction Regulations, 2003.

Contractor's Representative full name Signature Date
.....

Kindly confirm your acceptance of this appointment by completing the following:

I, (*assistant construction supervisor*) understand the implications of the appointment as detailed above and confirm my acceptance.

Assistant construction supervisor's Signature Date

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: (**Safety Officer's Name**)

APPOINTMENT OF THE CONSTRUCTION HEALTH AND SAFETY OFFICER IN TERMS OF CONSTRUCTION REGULATION 6(6)

I, (**contractor's name**) hereby appoint (**safety officer's name**) as the Construction Health and Safety Officer responsible for (**site address**) to manage all the health and safety issues as required in terms of the Act by establishing a health and safety program with elected health and safety Representatives.

You shall ensure that all the requirements in terms of the Act and in particular in terms of the Construction Regulations, 2003 are met. You shall also ensure that all appointed sub-contractors comply with the requirements as stipulated in the Construction Regulations, 2003.

You shall further ensure that all records, registers and required lists are maintained and shall stop construction work upon identifying any non-compliance by any contractor; this includes stopping any work should the competency of the person carrying out such work be questionable.

This appointment is valid from (**date**) to the completion of the stipulated construction work.

_____	_____	_____
Contractor's Representative full name	Signature	Date
.....		

Kindly confirm your acceptance of this appointment by completing the following:

I, (**construction health and safety officer's name**) understand the implications of the appointment as detailed above and confirm my acceptance.

_____	_____	_____
Construction Health & Safety Officer's full name	Signature	Date

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Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Construction Vehicle and Mobile Plant Inspector)**

**APPOINTMENT OF THE CONSTRUCTION VEHICLE AND MOBILE PLANT INSPECTOR
IN TERMS OF CONSTRUCTION REGULATION 21(1)(j)**

I, **(contractor's name)** hereby appoint **(construction vehicles and mobile plant inspector's name)** as the construction vehicles and mobile plant inspector responsible for **(site address)** to inspect on a daily basis all construction vehicles and mobile plant, as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to construction vehicles and mobile plant that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2003 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name Signature Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction vehicles and mobile plant inspector's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction vehicles and mobile plant Signature Date
inspector's full name

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Sub-Contractor's Name)**

APPOINTMENT OF SUB-CONTRACTOR IN TERMS OF THE CONSTRUCTION REGULATION 5(3)(b)

I, **(contractor's name)** hereby appoint **(sub-contractor's name)** as the sub-contractor responsible for **(site address)** to carry out the construction work of **(description of construction work)**.

You shall ensure that you meet all the requirements in terms of the Act and in particular in terms of the section 37(2) agreement and the Construction Regulations, 2003. You shall also ensure that all contractors appointed by yourself and reporting to you comply with the requirements as stipulated in the Construction Regulations, 2003.

You shall also ensure that all the information and specifications to ensure that the construction work is carried out in a safe manner are carried over to all contractors appointed and reporting to you.

You shall further ensure that all records, registers and required lists are maintained and that all persons appointed to carry out tasks as stipulated by these regulations are competent and have the necessary resources to complete their tasks effectively in such a manner that health and safety is not in any manner compromised.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

Contractor's Representative full name Signature Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(sub-contractor's name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Sub-Contractor's Representative full name Signature Da

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Construction Supervisor's Name)**

**APPOINTMENT OF THE CONSTRUCTION SUPERVISOR IN TERMS OF
CONSTRUCTION REGULATION 6(1)**

I, **(contractor's name)** hereby appoint **(construction supervisor's name)** as the Supervisor responsible for **(site address)** to carry out the construction work of **(description of construction work and area of responsibility)**.

In terms of this appointment you are required to ensure that all construction work performed under your supervision is carried out as follows:

1. By persons suitably trained and competent to do such work;
2. That all statutory appointments have been completed;
3. That, where required, health and safety committees are established and that meetings are accordingly held;
4. That all persons are aware and understand the hazards attached to the work being carried out;
5. That the required risk assessments are carried out;
6. That precautionary measures are identified and implemented;
7. That discipline is enforced at the construction site at all times;
8. That all identified statutory requirements are met; and
9. That any other interests in terms of health and safety with respect to the responsible area is met.
10. You will in writing delegate your duties to the Assistant Construction Supervisor while absent from site.

You are required to report any deviations of the above-mentioned instructions to **(contractor's name)**. This appointment is valid from **(date)** to the completion of the stipulated construction work. You shall submit a written weekly report on all shortfalls that have not been met in terms of these regulations.

Contractor's Representative full name

Signature

Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction supervisor)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction Supervisor's full name

Signature

Date

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

COMPANY LETTER HEAD

Attention: **(Excavation Work Supervisor's Name)**

**APPOINTMENT OF THE EXCAVATION WORK SUPERVISOR IN TERMS OF
CONSTRUCTION REGULATION 11(1)**

I, **(contractor's name)** hereby appoint **(excavation work supervisor's name)** as the excavation work supervisor responsible for **(site address)** to supervise and carry out all the necessary inspections in terms of all excavation work as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to excavation work that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met. This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name Signature Date

.....
Kindly confirm your acceptance of this appointment by completing the following:

I, **(excavation work supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Excavation Work Supervisor full name Signature Date

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Form work and Support work supervisor's name)**

APPOINTMENT OF THE FORMWORK AND SUPPORT WORK SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 10(a)

I, **(contractor name)** hereby appoint **(form work and support work supervisor's name)** as the formwork and support work supervisor responsible for **(site address)** to supervise and carry out all the necessary inspections in terms of all formwork and support work as per the provided checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to formwork and support work that the necessary precautionary measures are taken and enforced. Hazards are reported in writing to the Construction, Health and Safety Officer and the Construction Supervisor.

You shall further ensure that the requirements of the Construction Regulations are at all times met. This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name	Signature	Date
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Kindly confirm your acceptance of this appointment by completing the following:

I, **(formwork and support work supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Formwork and Support Work Supervisor's full name	Signature	Date
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Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Ladder Inspector's Name)**

APPOINTMENT OF THE LADDER INSPECTOR IN TERMS OF CONSTRUCTION REGULATION 13(A)

I, **(contractor's name)** hereby appoint **(ladder inspector's name)** as the ladder inspector responsible for **(site address)** to manage ladders on site. You should inspect the ladders as per the checklist at least once a week.

You shall ensure that when becoming aware of any health and safety hazards in respect to ladders that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2003 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name Signature Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(ladder inspector's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Ladder inspector's full name Signature Date

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: **(Risk Assessor's Name)**

APPOINTMENT OF THE CONSTRUCTION SITE RISK ASSESSOR IN TERMS OF CONSTRUCTION REGULATION 7(1)

I, **(contractor's name)** hereby appoint **(risk assessor's name)** as the construction site risk assessor responsible for **(site address)** to carry out risk assessments prior to the commencement of construction work and any other risk assessment that may be required for the duration of the construction work.

You shall ensure that all risks are identified and analyzed and that safe working procedures are drafted and implemented to reduce, mitigate or controls the hazards that were identified.

You will at least use the risk evaluation program with the provided checklists.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(construction site risk assessor's name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Construction site Risk Assessor's
full name

Signature

Date

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

COMPANY LETTER HEAD

Attention: **(Scaffolding Supervisor's Name)**

APPOINTMENT OF THE SCAFFOLDING SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 14(2)

I, **(contractor's name)** hereby appoint **(scaffolding supervisor's name)** as the scaffolding supervisor responsible for **(site address)** to supervise and carry out all the necessary inspections in terms of all scaffolding work. (Whether newly erected, altered or moved as per the provided checklist)

You shall ensure that when becoming aware of any health and safety hazards in respect to scaffolding work that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations, 2003 are at all times met.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name

Signature

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(scaffolding supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Scaffolding Supervisor's full name

Signature

Date

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

COMPANY LETTER HEAD

Attention: **(Stacking and Storage Supervisor's Name)**

APPOINTMENT OF THE STACKING AND STORAGE SUPERVISOR IN TERMS OF CONSTRUCTION REGULATION 26(a)

I, **(contractor's name)** hereby appoint **(stacking and storage supervisor's name)** as the stacking and storage supervisor responsible for **(site address)** to manage all stacking and storage on site.

You shall inspect all new stacking and thereafter as often as needed according to the checklist.

You shall ensure that when becoming aware of any health and safety hazards in respect to stacking and storage that these hazards are reported in writing to the Construction Health and Safety Officer and Construction supervisor and the necessary precautionary measures are taken and enforced.

You shall further ensure that the requirements of the Construction Regulations are at all times met. On identifying any shortfalls or hazards convey such information in writing to the construction supervisor.

This appointment is valid from **(date)** to the completion of the stipulated construction work.

Contractor's Representative full name

Supervisor

Date

Kindly confirm your acceptance of this appointment by completing the following:

I, **(stacking and storage supervisor's full name)** understand the implications of the appointment as detailed above and confirm my acceptance.

Stacking and Storage Supervisor's
Full name

Signature

Date

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

ANNEXURE 2

NOTIFICATION TEMPLATES

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Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

COMPANY LETTER HEAD

Attention: The Provincial Director
The Department of Labour
[Postal Address*]

NOTIFICATION OF CONSTRUCTION WORK ON CONTRACT [NUMBER] [CONTRACT DESCRIPTION]

In terms of regulation 3.(1) of the Construction Regulations , 2003 promulgated on 18 July 2003 in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), we hereby notify you of our intention to commence construction works on the abovementioned contract, which:

Includes the demolition of a structure exceeding a height of 3 meters,
Includes the use of explosives to perform the construction work,
Includes the dismantling of fixed plant at a height greater than 3 meters,
Will exceed 30 days or will involve more than 300 person days of construction,
Includes excavation work deeper than 1 meter, or
Includes working at a height greater than 3 meters above ground or a landing.

1. Parties involved on the Contract

1.1 The Principal Contractor is: [Contractor's Name]
[Contractor's postal address]
[Contractor's postal address]
Att: [Contractor's contact person and telephone number]

1.2 The Client (Employer) is: [Employer's Name]
[Employer's postal address]
Att: [Employer's contact person and telephone number]

1.3 The Client's Safety Agent is: [Safety Agent's Name]
[Safety Agent's postal address]
Att: [Safety Agent's contact person and telephone number]

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

1.4 The Contractor's Construction Supervisor is: [Contractor's Construction Supervisor's name and telephone number]

2. Details of the construction works

2.1 The physical address of the works is: [Physical address of works]
[Physical address of works]

2.2 The nature of the construction works is: [Provide a description of the works].

2.3 The expected commencement date of the Works is : [Insert expected commencement date]

2.4 The expected completion date of the works is : [Insert expected completion date]

2.5 The estimated maximum number of persons on the construction site:

2.6 A total of _____ contractors will be accountable to the Principal Contractor on the construction site during the execution of the Works. The names of the contractors already chosen are as follows: [Provide a list of the Contractor's subcontractors already appointed]

3. Other details

3.1 The Principal Contractor's compensation registration number is: _____

3.2 In terms of regulation 3.(3) a copy of this notification will be kept on site for

inspection. We trust the above is in order.

Yours faithfully,

Signature

Date

* Postal Address of Provincial Director as indicated in regulation 1 of the General Administrative Regulations, 1996.

Contractor

Witness 1

Witness 2

Employer

Witness 1

Witness 2

ANNEXURE 3

IDENTIFIED HEALTH AND SAFETY HAZARDS

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

ANNEXURE 3: IDENTIFIED HEALTH AND SAFETY HAZARDS

In terms of Regulation 4(1)(b) of the Construction Regulations 2003 the following hazards anticipated with the scope of work have been identified.

NOTE: The list of potential hazards is by no means intended to be all inclusive and is not limited to this list, and it remains the responsibility of the Contractor to identify all possible hazards with regards to his scope of work and to put measures in place to mitigate, reduce or control these hazards.

Potential Hazards

1. Commissioning of new installations
2. Confined space entry
3. Demolition/breaking into existing structures
3. Excavation shoring / brazing
4. Excavations been flooded during rain season
5. Explosives
7. Hazardous material handling / storage / management
8. Heat stress
9. Loading and off loading vehicles
10. Manual handling of materials
11. Plant and equipment integrity
12. Public and traffic safety
13. Requirements for plant isolations
14. Roofing and Cladding operations
15. Safe usage and storage of Oxygen, Acetylene and LPG cylinders
16. Scaffolding
17. Stacking and storage of equipment / materials
18. Tie-ins into existing equipment
19. Usage of compressed air and equipment
20. Work involving radioactive sources
21. Working in operational areas
22. Working on live electrical installations / sub-stations / MCC rooms
23. Working on moving equipment.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

ANNEXURE 4

COMPLIANCE COVID-19 OCCUPATIONAL HEALTH AND SAFETY MEASURES IN WORKPLACES COVID-19 (C19 OHS), 2020

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2