



NKANGALA DISTRICT MUNICIPALITY



PROJECT NO: 150362/3

CONSTRUCTION OF THE LOSKOP REGIONAL BULK WATER SUPPLY SCHEME IN THEMBISILE HANI LOCAL MUNICIPALITY – WORK PACKAGE 3 (20 ML/D WATER PURIFICATION PLANT IN VERENA D AND CLEAR WATER GRAVITY MAIN LINE)

C3: SCOPE OF WORK

Part C3: Scope of Work

- C3.1 Scope of Works (SANS 10403:2003)
- C3.2 Standard Specification
- C3.3 Project Specification
- C3.4 Particular Specification

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



C3.1: SCOPE OF WORK (SANS 10403:2003)

1. DESCRIPTION OF THE SCOPE OF WORKS

1.1. EMPLOYER'S OBJECTIVES

The Employers objective is to construct a new 20ML/day Water Treatment Works (WTW), from here on further called the Loskop Dam WTW, which will be taken over by the Thembisile Hani Local Municipality.

The hydraulic capacity of the works is based on a final treated water supply of 20MLD over 20 hours. The WTW is designed to produce the required flow, to allow for losses due to backwashing, de-sludging and/or any other maintenance requirements.

The Loskopdam WTW is part of a bigger supply scheme for the area.

1.2. OVERVIEW OF THE WORKS

This project entails the construction of the following:

- a. Admin Building;
- b. Inlet Works;
- c. Dissolved Air Floatation and Filtration;
- d. Granular Activated Carbon Filters;
- e. Chlorine Contact and Clearwell Tanks;
- f. Sludge dams;
- g. Wash water recovery pump station;
- h. Interconnecting pipework;
- i. Road and site works;
- j. Nominated M&E contractor for the mechanical and electrical works;
- k. Final water pipeline to reservoir.

1.3. EXTENT OF THE WORKS

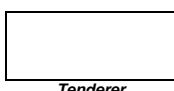
The Works to be carried out by the Contractor under this Contract comprise mainly the following:

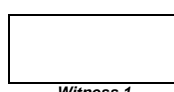
(i) General

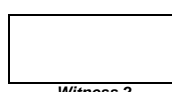
1. Contractor's establishment on site;
2. Training of Temporary Workforce;
3. 4 Months operation and training of WTW, after successful commissioning the works.

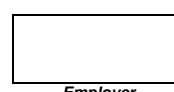
(ii) Concrete Works

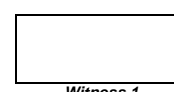
1. Construction of water retaining structures;
2. Testing for water tightness;
3. Commissioning each unit process in conjunction with M&E contractor.

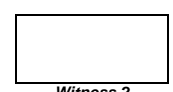

Tenderer


Witness 1


Witness 2


Employer


Witness 1


Witness 2

**(iii) Pipelines**

1. Clear and grub and stockpile topsoil
2. Excavation of pipe trenches
3. Installation of suitable pipe bedding (insitu / imported)
4. Laying and testing of pipes
5. Backfilling of pipe
6. Installation of 1000 mm diameter interconnecting GRP pipelines between unit processes
7. Installation of approximately 0.7 km 630 mm dia. oPVC pipeline to the reservoir.

(iv) Mechanical & Electrical Works (Nominated Sub Contractor)

1. Supply and installation of mechanical equipment, required for the various unit processes, to be carried out by a Subcontractor Selected in Consultation with Employer in accordance with Clause 4.4.4 of GCC 2015.
2. Supply and installation of all electrical equipment, controllers, instrumentation and telemetry to be carried out by a Subcontractor Selected in Consultation with Employer in accordance with Clause 4.4.4 of GCC 2015.

1.4. LOCATION OF THE WORKS

The proposed site is in the proximity of Verena in the Thembisile Hani Local Municipal area

Site Co-ordinates:

25° 27.947'S, 29° 4.060'E

1.5. TEMPORARY WORKS

All temporary works (scaffolding, shuttering, shoring etc) to be designed by the contractor and to be approved by the Employer's Agent. (Clause 4.1.2 of the Contract)

2. ENGINEERING**2.1. DESIGN SERVICES AND ACTIVITY MATRIX**

Works designed by, per design stage:

Description	Responsibility
Design of Works (All stages)	Employer's Agent
Concept, feasibility and overall process	Employer
Basic Engineering and detail layouts to tender stage	Employer's Agent
Final Design of Works	Employer's Agent

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Description	Responsibility
Final Design to approved for construction stage	Employer
Preparation of tender documentation	Employer's Agent
Placement of Advertisements in newspapers	Employer
Application of Eskom connection point	Employer / Employer's Agent
Payment of Eskom connection fees	Employer
Appointment of sub-contractors	Contractor
Supervision	Employer's Agent
Preparation of as-built drawings	Contractor / Employer's Agent
Completion certificate	Employer's Agent / Employer / Contractor

2.2. EMPLOYER'S DESIGN

The permanent works included in this contract has been designed by the Employer's agent. The detail of the works is indicated on the drawing and in the specifications.

2.3. DESIGN BRIEF (CONTRACTORS DESIGN)

The Contractor is responsible for the design and upholding of the following items:

- Shoring where required;
- Dewatering excavations;
- All other temporary works required for the successful completion of the works.

2.4. DRAWINGS

The Employer's Agent will provide the Contractor with one full set of drawings (over and above the drawings supplied for construction, which will be used exclusively for the recording of as built information by the Contractor.

Only dimensions, positions, levels, co-ordinates etc. that change from the original values, will be required to be entered on these drawings. These drawings, fully marked up, will be handed to the Employer's Agent at the issue of the Certificate of completion, which will not be issued until the as-built information has been received.

The drawings listed below are attached under **Part C5: Annexures** and provide an overview of the project.

Additional construction drawings will, in terms of Clause 5.9 of the General Conditions of Contract (2015), be issued to the Contractor by the Employer's Agent/Employer on the commencement date and from time to time as required.

Tenderer

Witness 1

Witness 2

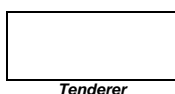
Employer

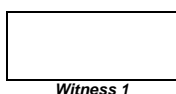
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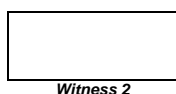
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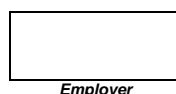


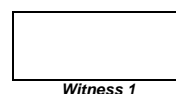
Project Ref	Structure	Drawing No.	Title
10 SITE LAYOUT			
LD001	10	100	RENDERS OF LOSKOP DAM SITE
LD001	10	101	CONTRACTORS SIGNAGE BOARD
LD001	10	102	SITE LAYOUT SHEET 1
LD001	10	103	SITE LAYOUT SHEET 2
LD001	10	104	SITE LAYOUT SHEET 3
30 INLET WORKS			
LD001	30	100	INLET WORKS RENDERS
LD001	30	101	INLET WORKS ELEVATIONS
LD001	30	102	INLET WORKS GROUND FLOOR PLAN
LD001	30	103	INLET WORKS FIRST FLOOR PLAN
LD001	30	104	INLET WORKS ROOF PLAN
LD001	30	105	INLET WORKS SECTIONS AND DETAILS
LD001	30	106	INLET WORKS SECTIONS AND DETAILS
LD001	30	107	INLET WORKS SECTIONS AND DETAILS
LD001	30	108	INLET WORKS SECTIONS AND DETAILS
LD001	30	109	INLET WORKS SECTIONS AND DETAILS
LD001	30	110	INLET WORKS SECTIONS AND DETAILS
LD001	30	111	INLET WORKS SECTIONS AND DETAILS
LD001	30	112	INLET WORKS SECTIONS AND DETAILS
40 CHLORINE CONTACT TANK			
LD001	40	100	CHLORINE CONTACT TANK RENDERS
LD001	40	101	CHLORINE CONTACT TANK ELEVATIONS
LD001	40	102	CHLORINE CONTACT TANK FLOOR PLAN
LD001	40	103	CHLORINE CONTACT TANK TOC PLAN
LD001	40	104	CHLORINE CONTACT TANK SECTIONS & DETAILS
LD001	40	105	CHLORINE CONTACT TANK SECTIONS & DETAILS
LD001	40	106	CHLORINE CONTACT TANK SECTIONS & DETAILS
LD001	40	104	CHLORINE CONTACT TANK SECTIONS & DETAILS
LD001	40	105	CHLORINE CONTACT TANK SECTIONS & DETAILS
LD001	40	106	CHLORINE CONTACT TANK SECTIONS & DETAILS

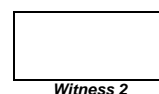

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Witness 1


Witness 2

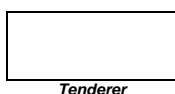

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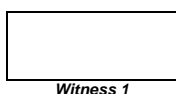

Witness 1

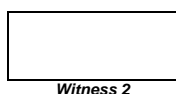

Witness 2

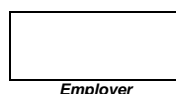


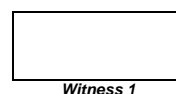
60 DAFF			
LD001	60	100	DAFF RENDERS
LD001	60	101	DAFF ELEVATIONS
LD001	60	102	DAFF PLAN OF SERVICE GALLERY
LD001	60	103	DAFF PLAN OF LOWER GALLERY
LD001	60	104	DAFF PLAN OF UPPER GALLERY
LD001	60	105	DAFF SECTIONS AND DETAILS
LD001	60	106	DAFF SECTIONS AND DETAILS
LD001	60	107	DAFF SECTIONS AND DETAILS
LD001	60	108	DAFF SECTIONS AND DETAILS
LD001	60	109	DAFF SECTIONS AND DETAILS
LD001	60	110	DAFF SECTIONS AND DETAILS
LD001	60	111	DAFF SECTIONS AND DETAILS
LD001	60	112	DAFF SECTIONS AND DETAILS
60 GAC			
LD001	60	150	GAC RENDERS
LD001	60	151	GAC ELEVATIONS
LD001	60	152	GAC PLAN OF SERVICE GALLERY
LD001	60	153	GAC PLAN OF LOWER GALLERY
LD001	60	154	GAC PLAN OF UPPER GALLERY
LD001	60	155	GAC SECTIONS & DETAILS
LD001	60	156	GAC SECTIONS & DETAILS
LD001	60	157	GAC SECTIONS & DETAILS
LD001	60	158	GAC SECTIONS & DETAILS
LD001	60	159	GAC SECTIONS & DETAILS
LD001	60	160	GAC SECTIONS & DETAILS
LD001	60	161	GAC SECTIONS & DETAILS
100 SLUDGE DAMS			
LD001	100	100	SLUDGE DAM (3 OFF.) RENDERS
LD001	100	101	SLUDGE DAM (3 OFF.) ELEVATIONS
LD001	100	102	SLUDGE DAM (3 OFF.) SETTING OUT CONFIGURATION
LD001	100	103	SLUDGE DAM (3 OFF.) FLOOR PLAN
LD001	100	104	SLUDGE DAM (3 OFF.) SECTIONS & DETAILS
LD001	100	104	SLUDGE DAM (3 OFF.) SECTIONS & DETAILS
LD001	100	104	SLUDGE DAM (3 OFF.) SECTIONS & DETAILS
100 SLUDGE DAM SPLITTER BOX			
LD001	100	150	SPLITTER BOX RENDERS
LD001	100	151	SPLITTER BOX ELEVATIONS
LD001	100	152	SPLITTER BOX FLOOR PLAN
LD001	100	153	SPLITTER BOX TOC PLAN
LD001	100	154	SPLITTER BOX SECTIONS AND DETAILS
LD001	100	155	SPLITTER BOX SECTIONS AND DETAILS
LD001	100	156	SPLITTER BOX SECTIONS AND DETAILS
LD001	100	157	SPLITTER BOX SECTIONS AND DETAILS

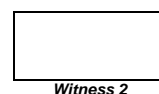

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Witness 1


Witness 2


Employer


Witness 1


Witness 2



110 CHLORINE BUILDING			
LD001	110	100	CHLORINATION BUILDING RENDERS
LD001	110	101	CHLORINATION BUILDING ELEVATIONS
LD001	110	102	CHLORINATION BUILDING FLOOR PLAN
LD001	110	103	CHLORINATION BUILDING ROOF PLAN
LD001	110	104	CHLORINATION BUILDING BUILDING SECTIONS & DETAILS
LD001	110	105	CHLORINATION BUILDING BUILDING SECTIONS & DETAILS
LD001	110	106	CHLORINATION BUILDING BUILDING SECTIONS & DETAILS
LD001	110	107	CHLORINATION BUILDING BUILDING SECTIONS & DETAILS
110 ADMIN BUILDING			
LD001	110	150	ADMIN BUILDING RENDERS
LD001	110	151	ADMIN BUILDING ELEVATIONS
LD001	110	152	ADMIN BUILDING FLOOR PLAN
LD001	110	153	ADMIN BUILDING ROOF PLAN
LD001	110	154	ADMIN BUILDING BUILDING SECTIONS & DETAILS
LD001	110	155	ADMIN BUILDING BUILDING SECTIONS & DETAILS
LD001	110	156	ADMIN BUILDING BUILDING SECTIONS & DETAILS
LD001	110	157	ADMIN BUILDING BUILDING SECTIONS & DETAILS
LD001	110	158	ADMIN BUILDING BUILDING SECTIONS & DETAILS
120 RECYCLE PUMP STATION			
LD001	120	100	RECYCLE PUMP STATIONS RENDERS
LD001	120	101	RECYCLE PUMP STATIONS ELEVATIONS
LD001	120	102	RECYCLE PUMP STATIONS FLOOR PLAN
LD001	120	103	RECYCLE PUMP STATIONS TOC PLAN
LD001	120	104	RECYCLE PUMP STATIONS SECTIONS AND DETAILS
LD001	120	105	RECYCLE PUMP STATIONS SECTIONS AND DETAILS
LD001	120	106	RECYCLE PUMP STATIONS SECTIONS AND DETAILS
LD001	120	107	RECYCLE PUMP STATIONS SECTIONS AND DETAILS

2.5. DESIGN PROCEDURES

As described in section 2.3 above, the contractor must submit his methodologies and designs as related to the works to the Employer's agent for approval before commencing the with specific portion of works. Work on the specific portions may only commence once written approval has been received from the Employer's Agent.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



3. PROCUREMENT

3.1. PREFERENTIAL PROCUREMENT PROCEDURES

a) Requirement:

Preferential procurement procedures are to be followed as specified in the PCY Particular Specification

b) Resource standard pertaining to targeted procurement:

Refer to PCY Particular Specification

3.2. SUBCONTRACTING

a) Scope of mandatory subcontract work

- Contract Participation Goals

30 % of the estimated civil construction works value of the contract has been allocated to be subcontracted as part of the CPG as specified by the Contract. The scope of the works to be subcontracted is listed as below. The items relating to the below has been removed from the bill of quantities and an approximate value has been added as a Provisional Sum under schedule PCY. The CPG scope items are still however indicated on the tender drawings Refer to section Particular Specification PSY for further clarification.

CPG Scope includes:

- Administration Building
- Sludge ponds
- Roads (Layer works & paving)
- Interconnecting pipework
- 700m long 630mm dia. oPVC gravity main

- Nominated Subcontractor: Sub-contracting of Mechanical and Electrical works

All mechanical and electrical work (including telemetry) will be subcontracted to a specialist (nominated subcontractor). This subcontractor will be appointed in Consultation with the Employer as per Clause 4.4.4 of the GCC 2015. Provision has been made for a mark-up on the M&E contractor. All costs associated with accommodating M&E contractor on site should be included in the mark-up. All costs associated with the planning, programming and administration of the M&E contract will be deemed covered under the mark-up provided for it.

b) Preferred subcontractors / Supplier

Details of preferred subcontractor / suppliers will be made available by the Employer a later stage

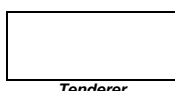
c) Subcontracting procedures

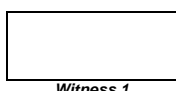
Pease refer to Particular Specification PCY 8

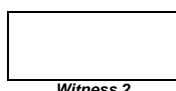
d) Attendance on subcontractors

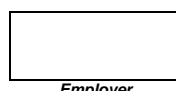
- Subcontractors appointed as per CPG specified

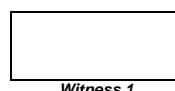
The contractor is to supply additional staff to assist and monitor appointed subcontractors as specified in Particular Specification PCY.

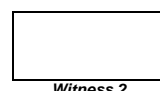

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Witness 1


Witness 2


Employer


Witness 1


Witness 2



4. CONSTRUCTION

a) Works specification

- **Applicable SANS standards**
Refer to Standard Specifications in the contract
- **Applicable national and international standards**
Refer to Standard Specifications in the contract
- **Particular/generic specifications**
Refer to Particular Specifications in the Contract
- **Certification by recognized bodies**
Only certification by SABS will be allowed
- **Acrément certificates**
None

a) Plant and material

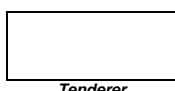
- **Plant and material supplied by the employer**
No plant or material will be supplied by the employer
- **Material, samples and shop drawings**
All materials used, where such mark has been awarded for a specific type of material, bear the SABS mark.

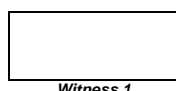
b) Construction Equipment

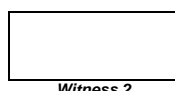
- **Requirements for equipment**
The following equipment is deemed necessary for the successful completion of the project:
 - Excavators
 - Tipper trucks
 - TLBs
 - Water Carts
 - Compactors (Wackers)
 - LDVsPoint will be assigned for the number of plant supplied as per Returnable Schedule O
- **Equipment provided by the employer**
No equipment will be supplied by the employer

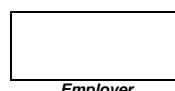
c) Existing Services

- **Known services**
There are no known services on site. This needs to be confirmed by the contractor prior to excavation in any area.
- **Treatment of existing services**
Existing services which are encountered must be reported to the Employer's Agent who will instruct on which action to be taken.
- **Use of detection equipment for the location of underground services**
None foreseen
- **Damage to services**
The contractor shall repair any amend any services damaged directly due to the construction activities. The cost of which will be covered by the rate for crossing of services in the bill of quantities.
- **Reinstatement of services and structures damaged during construction**
As per the previous item.

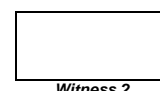

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Witness 1


Witness 2


Employer


Witness 1


Witness 2



d) Site establishment

- Services and facilities provided by the employer

No services or facilities will be provided by the employer. The contractor will be responsible to make his own arrangements for the supply of water, electricity and communication. There will be no municipal services to connect to.

- Facilities provided by the contractor

Offices

The various types of offices required shall be as instructed by the Engineer. Unless otherwise specified in the Contract Documentation, the fittings, furniture and equipment shall conform to the following requirements:

- Office desks shall have a surface area of at least 1,5 m² and shall be provided with at least three drawers, one of which can be locked.
- General-purpose steel cabinets shall have at least 1,5 m² shelf area and a volume of 0,7 m³ each. Each cabinet shall have a lock with two keys.
- Steel filing cabinets shall each be fitted with four drawers on runners. Each cabinet shall be fitted with a lock and shall be 1,3 m high, 460 mm wide and 600 mm from front to back.
- Shelves shall be suitable for storing all the contract files and documents.
- Electric power plug points shall be provided. Each office shall have at least two 15 ampere plug points.
- Lights shall be 1 500 mm, 58W fluorescent tubes or 1 500 mm, 22W LED tubes.
- Drawing tables shall have either an inclined or a horizontal drawing surface as may be required and a smooth top built to the dimensions instructed by the Engineer.
- Draughtsman's stools shall be fitted with a padded seat with an adjustable seat height.
- The conference table shall be large enough to seat twelve persons and shall have a surface area of at least 4m².
- Chairs shall be robust and comfortable.
- A complete telecommunication and electronic data transfer service with uncapped Wi-Fi connectivity to the internet shall be provided for the use of all the Engineer's site staff.
- The colour combination printer, copier, scanner machines shall be capable of printing on A3 & A4 sized paper
- Blinds shall be adjustable venetian blinds to permit light to enter the room.
- Notice boards and white boards shall be provided as specified or as required by the Engineer.
- Bookcases shall have at least three shelves, each with a minimum length of 0,9 m.
- Wall mounted pivot plan filing systems shall be complete with wall rack and pivot brackets to accommodate ten plan clamps where each plan clamp can hold at least ten A0 size drawings.
- Where required by the Engineer, the Contractor shall provide and install air-conditioning units and heaters. Air-conditioning units shall be of the wall mounted split unit inverter type capable of either cooling or heating a room. The capacity of the air-conditioning units shall be adequate for the room area as recommended by the supplier thereof. Heaters shall be of a space-heating type without exposed elements and shall have a capacity of not less than 1.5 kW each.

Where required by the Engineer, the following items shall be provided by the Contractor for his use:

- A rain gauge securely mounted on a pole in a position as indicated by the Engineer.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



- A minimum and maximum atmospheric temperature gauge.
- An approved digital thermometer capable of measuring surface temperatures from -10oC up to +350oC.
- Mobile weather stations capable of measuring temperature, wind, chill, barometric pressure, UV levels, rainfall, wind direction and speed. The device shall also have on-board storage capabilities for at least 7 (seven) days and shall include a USB PC connection with software, allowing data to be downloaded electronically.
- A three metre aluminium straight edge complete with two wedges 200 mm long, tapering from 0 to 20 mm, calibrated in mm.
- A measuring wheel with a circumference of 1,0 m and equipped with a distance recording device.
- Approved first aid kits to be kept at the site office and/or laboratories and in the site staff vehicles.

Kitchen

The contractor shall provide a separate kitchen unit for the use of the Engineer and his staff which includes the following:

- Min 300 l fridge/freezer combination fridge
- Microwave of min 36 l and 1 000 W
- Cordless kettle
- A set of 12 x each of knives, forks, spoons and teaspoons
- A set of 12 x each of white ceramic crockery including dinner plates, side plates, bowls, coffee mugs, tea cups and saucers
- A set of 24 x beer glasses
- 1 x large wooden cutting board
- 1 x kitchen knife set in knife block which includes at least a large carving knife, bread knife, medium knife, pairing knife and kitchen scissors
- 2 x braai tongs
- 1 x meat casserole with lid

Car ports

Car ports shall be so constructed as to protect vehicles parked in them at all times against the direct rays of the sun. The car ports shall have either a concrete floor or a layer of broken stone to alleviate dusty and muddy conditions. Each car port shall be at least 3,0 m wide, 6,0 m long and 2,5 m high. The roofs of all car ports shall be waterproof.

Areas around offices and laboratories

The access roads and parking areas at the offices and laboratories shall be treated to make them dust free, either with a layer of crushed stone or with an approved bituminous surfacing. They shall be well drained and kept trafficable and free from mud at all times. Footpaths shall be paved with concrete, interlocking blocks or paving slabs to provide convenient, all weather access to all buildings.

Ablution unit

An ablution unit with a clean potable hot and cold water supply and a water-borne sewerage system, including septic tanks if necessary, shall be provided for the Engineer's facilities. The ablution unit shall be established in a position that is easily accessible to both the Engineer's offices and the laboratory buildings. The ablution unit shall have separate rooms for males

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and females and each room shall have a floor area of at least 6m² with a lockable door and shall be equipped with:

- A 1 500 mm, 58W fluorescent tube or 1 500 mm, 22W LED tube.
- An opening window fitted with a blind,
- A vitreous enamel WC pan with a PVC seat and covers, a flush cistern and a toilet roll holder. The WC must be separate from the entrance/basin area and it shall also have a lockable door.
- A vitreous enamel urinal with flush cistern in the male unit.
A vitreous enamel wash basin.
- A mirror and a paper towel dispenser.
- A covered wastepaper bin next to the WC and another bin next to the towel dispenser.

Where specified in the Contract Documentation a separate shower and change room complete with shower, hot and cold running water and drains shall also be provided

- **Storage and laboratory facilities**

No on-site laboratory facilities will be required. The contractor must ensure that he provides adequate storage for the construction activity needs.

- **Other facilities and services**

No temporary services will be supplied by the Employer. The contractor must ensure to supply his own foreseen required services

- **Vehicles and equipment**

As stated under "Facilities provided by the Contractor"

- **Advertising rights**

No additional advertising will be allowed other than branding of vehicles, equipment and employee clothing.

- **Notice boards**

The contractor shall supply 2 x name board as per the details indicated on the construction drawings for the entire duration of the contract.

e) Site Usage

Site usage is limited to functions associated with the project only. The water treatment works and pipeline are all located on government land or servitudes registered in the name of the government. The contractor may not traverse on any private properties without written approval from Employer's Agent and the Landowner. It is however not foreseen that access will be required to any privately owned land.

f) Permits and way leaves

Not applicable.

g) Alterations, additions, extensions and modifications to the existing works

Not applicable.

h) Inspection of adjoining properties

Not applicable.

i) Water for construction purposes

The contractor shall make his own arrangements regarding a suitable supply of water for the project and he must make adequate provision in his tender for all negotiations and procurement of water for construction activities and all related costs will be deemed to be included in his tendered rates.

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Water for use in the concrete mix must be suitable for concrete and be approved by the Engineer, before any construction commences. Should ready mix concrete be used, the water quality will be deemed covered by the suppliers design engineers.

Water may not be abstracted from the local river, streams or Irrigation canals. If the contractor wishes to do so he must submit a request to the Employers agent which includes all the necessary permissions, permits or licenses required to do so.

j) Survey control and setting out of the works

The Employers Agent will provide survey beacons. The contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.

The Contractor shall take care that property beacons, trigonometrical survey beacons or setting-out beacons are not displaced or destroyed without the consent of the Employer's Agent. Property beacons and trigonometrical survey beacons that have been displaced or destroyed shall be replaced by a registered land surveyor, who shall certify such replacement.

The cost of replacing all beacons displaced or destroyed during the course of the Contract without the consent of the Employer's Agent shall be borne by the Contractor.

5. MANAGEMENT

5.1. Management of the works

a) Applicable SANS standards

The Contractor is referred to SANS 1921: 2004 parts 1, 2 and 3: Construction and Management Requirements for Works Contracts. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project.

Certain aspects however require further attention as described hereafter.

b) Particular / Generic specifications

Refer to Part C3.4

c) Planning and programming

Preliminary programme

The Contractor shall include with his tender a preliminary programme on the prescribed form to be completed by all Tenderers. The programme shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

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

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The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his programme for all possible delays due to normal adverse weather conditions and special non-working days as specified in the Special Conditions of Contract, in the Project Specifications and in the Contract Data.

The following constraints shall be taken into account in preparing the preliminary construction programme which must be submitted with the Tender. These same constraints shall apply to the final construction programme:

- (a) the Contractor must indicate in his tender the proposed contract period;
- (b) plant and personnel requirements to complete the project must be incorporated in the Tender and shown on the programme;
- (c) Provision must be made for the incorporation of the M&E sub-contract;
- (d) All costs associated with the planning, programming and administration of the M&E contract will be deemed covered under the mark-up provided for it;

Programme in terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to Clause 5.6 of the General Conditions of Contract, be furnished within the time stated in the Contract Data. The preliminary programme to be submitted with the tender shall be used as basis for this programme.

The following must be stated on the programme:

- (a) The quantity of work applicable to each bar item as well as the rate at which the work will be completed.
- (b) A budget of the value of completed work, month by month, for the full contract period.
- (c) The critical path.
- (d) Works to be undertaken by Local Contractor (if applicable).
- (e) Works to be undertaken by Sub-Contractors.
- (f) Schedule of plant and resources to be utilized.

The Contractor's attention is also drawn to clause 5.6 of the General Conditions of Contract 2015.

d) Sequence of the works

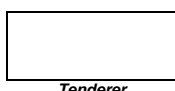
The contractor may programme the work as to ensure that the works is completed within the duration stated in the Contract Data. This program must make allowance for the M&E contractor to commission his works and complete a 28-day, trouble free, trial operational period.

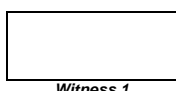
e) Software application for programming

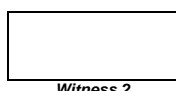
All programmes must be compiled in Microsoft Projects

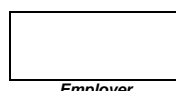
f) Methods and procedures

- Cleanliness of the site:
The contractor shall ensure that the site remains clear off all rubbish
- Protecting of trees and shrubs:
Protection of trees and shrubs to be as per EMP and ROD
- Blasting operations:
Blasting operations must adhere to the following acts:

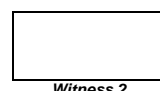

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1. OCCUPATIONAL HEALTH AND SAFETY ACT (85 OF 1993)
2. EXPLOSIVES ACT, 1956 (ACT 26 OF 1956)

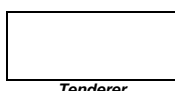
- Borrow pits, disposal of access material, deposition of material etc. in earthworks activities:
Spoil sites shall be determined on site in conjunction with the Employers Agent, the PSC, and the local authority. The Contractor shall be permitted to use only those spoil areas approved by the Engineer. Should the Contractor wish to use any other spoil area for the disposal of soil, rubble, vegetation, etc., its use shall be subject to the approval of the Employers Agent and the landowner.
- The management and disposal of water on site: (Read with SANS 1921 - 1: 2004 clause 4.6)
The Contractor shall pay special attention to the management and disposal of water and stormwater on the site. It is essential that all completed works or parts thereof are kept dry and properly drained. Claims for delay and for repair of damage caused to the works as a result of the Contractor's failure to properly manage rain and surface water, will not be considered
- Access, roads, maintenance of accesses
The contractor will maintain the access roads to the works at all times.
Access to all properties affected by the construction activities must remain open, and any temporary closures must be arranged in writing with the affected parties.
- Hours of work:
Hours of work are daylight hours from Monday to Saturday.
- Training of operators
The contractor must train the municipal staff who will be taking over works

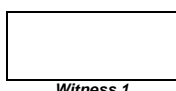
g) Quality plans and control

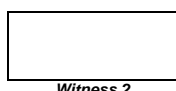
- Quality Assurance (QA) (Read with SANS 1921 – 1: 2004 clause 4.4)
The Contractor will be solely responsible for the production of work that complies with the Specifications to the satisfaction of the Engineer. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Engineer will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems which could cause a delay or failure.

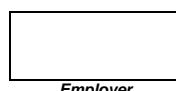
The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his QA-system. His attention is drawn to the fact that it is not the duty of the Engineer or the Engineer's representative to act as foreman or surveyor.

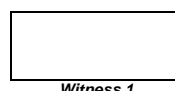
- Process control
The Contractor shall arrange for his own process control tests. The Contractor may establish his own laboratory on site for this purpose, or he may employ the services of an independent commercial laboratory. Whatever method is used, the Contractor must submit the results of tests carried out on materials and workmanship when submitting work for acceptance by the Engineer. The costs for these tests shall be deemed to be included in the relevant rates and no additional payment will be made for testing as required.


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- Acceptance control

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Engineer for acceptance control. However, before accepting any work, the Engineer shall have his own acceptance control tests carried out by the dedicated site laboratory as approved by the client. The cost of acceptance testing shall be to the account of the client.

h) Environmental

Refer to the Environmental Plan in the Particular Specification

i) Accommodation of traffic on public roads occupied by the contractor

- Basic Requirements

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective and that courtesy is extended to the public at all times.

Failure to maintain road signs, warning signs or flicker lights, etc., in a good condition shall constitute ample reason for the Engineer to suspend the work until the road signs, etc., have been repaired to his satisfaction.

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

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations.

The Contractor shall provide and grant access to persons whose properties fall within or adjoin the area in which he is working.

- Payment

The Contractor's tendered rates for the relevant items in the Bill of Quantities shall include full compensation for all possible additional costs which may arise from this, and no claims for extra payment due to inconvenience as a result of the modus operandi will be considered.

j) Other contractors on site

No other contractors other than appointed sub-contractors are foreseen to be on site.

k) Recording of weather

The Contractor shall provide a rain gauge close to the office of the Employer's Agent or as directed by the Employer's Agent and precautions shall be taken to restrict access to the rain gauge.

l) Format of communications

All communication to be done via electronic mails

m) Key personnel

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Key personnel must be as stipulated in the Returnable schedules under Tender Data. Points will be allocated for the qualifications and experience of the key personnel listed.

n) Management meetings

- Site Meetings:

Times: Every two weeks

Location: Site office

Attendance: Contract manager, Site Agent, Health and Safety Officer and Sub-contractor representatives as required

- Technical Meetings:

Times: Every other two weeks

Location: Site office

Attendance: Contract manager, Site Agent, Health and Safety Officer and Sub-contractor representatives as required

o) Forms for contract administration

To be formalized after appointment

p) Electronic payment

Requirements for electronic payments to be communicated by the Employer after appointment.

q) Daily records

A daily site diary must be kept on site whereby the deliveries, rainfall, daily progress, plant, staff and general daily events are recorded. Both the Site agent and Employer's Agent's Representative must sign each entry off at the end of the day.

r) Bonds and guarantees

As specified in the Contract Data

s) Payment certificates

As specified in the Contract Data

t) Permits

No permits are foreseen to be required, excluding statutory permits

u) Proof of compliance with the law

Refer to Contract Data

v) Insurance provided by the employer

Refer to Contract Data

w) Quality plans and control

The contractor will be provided with a set of standard Quality Control Check sheets which will be used to monitor the quality of the works. Each portion of the works must be signed off by the Employer's Agent and the Site Agent.

6. HEALTH AND SAFETY

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Refer to the Baseline Risk Assessment and Health and Safety Specifications contained in the Document's Annexures.

7. ANNEXURES

Refer to **Part C5: Annexures**.

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Witness 2

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Witness 1

Witness 2