

THEMBISILE HANI LOCAL MUNICIPALITY



CONSTRUCTION OF MZIMUHLE INFRASTRUCTURE (WARD 10)

SCOPE OF WORK

C3.1 Scope of Work

3.1.1 Employer's objectives

The employer's objectives are to deliver clean water supply infrastructure using labour intensive methods, whereby the local community benefit throughout the entire project and in doing so provide work place training opportunities to learners.

3.1.2.1 Overview of the works

The Contract will entail the construction of reticulation pipelines (uPVC and HDPE) to complete the water infrastructure of Mzimuhle Settlement. The pipelines to be constructed includes distributor mains and internal reticulation. Also with regards to EPWP requirements, labour- intensive works comprise the activities described in SANS 1921-5, Earthwork activities which are to be performed by hand, and its associated specification data. Such works shall be constructed using local workers who are to be temporarily employed in terms of this Scope of Work. Time is of the essence for this contract. The Tenderer shall state the time in calendar months required by him/her to complete the Works.

3.1.2.2. Extent of the works

- Establishment of camps on site
- Site clearance and earthworks
- Accommodation of traffic
- Protection of existing services.
- Provision of all materials, special fittings and accessories as required, to complete the work as prescribed.
- Laying, bedding and installation of all pipes (uPVC and HDPE) and accessories.
- Concrete work associated with the above-mentioned equipment.
- Construction of concrete anchor blocks associated with the above.
- Installation of metered yard stand pipes.
- Installation of pumps with pipes.
- Manage all site staff, CLO and local labourers, plant, equipment and materials
- Manage all quality controls as required by the Engineers
- Commissioning of the works.
- Maintenance on the works for a twelve-month period.

3.1.3 Labour-Intensive Works

All the relevant tasks/works shall be constructed using Labour-Intensive Construction Methods only

3.1.4 Location of the works

The project is situated within Nkangala District Municipality in Mpumalanga province and it falls under Thembisile Hani Local Municipality. Mzimuhle township also known as Gemsbokspruit is situated 90km north-east of Pretoria along the Absalom road. The GPS coordinates and Municipal wards of the townships are presented in a table below.

Table Error! No text of specified style in document.-1: Location of Area

No	Village name	Ward	Latitude (S)	Longitude (E)
1	Mzimuhle	10	25°24'14.9"S	28°53'56.5"E

Locality Details

- Province : Mpumalanga Province
- District : Nkangala District Municipality
- Municipality : Thembisile Hani Local Municipality

3.1.5 Temporary works

The Contractor shall provide, erect, maintain and remove on completion of the Contract, ample temporary offices and sheds for the proper storage of perishable materials and for the use of his workmen.

C3.2 Drawing Descriptions

The following drawings are applicable to the contract:

3.2.1 Construction Drawings

All key plans for this type of project are included in the tender document as "Part C.8 Drawings".

3.2.2 Typical Details

All typical details for this type of project are included in the tender document as "Part C.8 Drawings".

3.2.3 Civil Engineering Drawings

The drawings used for setting up the Bills of Quantities are indicated above in paragraph 3.2.1 and 3.2.2

C3.3 Procurement

3.3.1 Preferential procurement procedures

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

C3.4 Construction

3.4.1 Setting out of Works

The Employer shall arrange for the Contractor to be given sufficient reference pegs from which to work. The value of all bench marks shall be given in writing. The Contractor shall bear the cost of any re-survey and the cost of re-establishment or checking of any pegs, bench marks, etc. disturbed, destroyed or interfered with in any way and the cost of any survey to prove the accuracy of the setting out after any disturbance of or interference with any peg or bench mark. All surveys or re-survey shall be by Surveyors appointed by the Employer.

3.4.1 Applicable Standardized Specification

The standard specifications on which this contract is based are:

- SABS 1200 A 1996 : General
- SABS 1200 C 1980 (Amended 1982) : Site Clearance
- SABS 1200 D 1989 : Earthworks
- SABS 1200 GA 1982 : Concrete (Small Works)
- SABS 1200 G 1982 : Concrete

The following SABS specifications are also referred to in this document and the Contractor is advised to obtain them from Standards South Africa (a division of SABS) in Pretoria:

SABS 1921 – 1 (2004) Construction and Management Requirements for Works Contracts Part 1: *General Engineering and Construction Works*.

3.4.3 Particular / generic specifications

The relevant provisions of the SABS 1200 (1981 edition) shall apply to the contract with the following amendments:

1115 Replace clause with the following:

The general conditions of contract are the General Conditions of Contract for Construction Works, Second Edition (2015) as published by the South African Institution of Civil Engineering read in conjunction with the Contract Data.

3.4.4 EPWP labour intensive specification

3.4.4.1 Labour intensive competencies of supervisory and management staff

Contractors having a CIDB contractor grading designation of **7CE and higher** shall only engage supervisory and management staff in labour intensive works who have either completed, or are registered for training towards, the skills programme outlined in Table 1.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain the Pump Station	
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour Intensive Construction Systems and Techniques	This unit standard must be completed, and Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain the Pump Station	
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent / Manager (i.e the contractor's most senior representative that is resident on the site)	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard

3.4.4.2 Employment of unskilled and semi-skilled workers in labour-intensive works

3.4.4.2.1 Requirements for the sourcing and engagement of labour

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

3.4.4.2.1.2 The rate of payment set for the EPWP is:

- a) Bricklayers –
- b) Assistant Bricklayers –
- c) Labourer -
- d) Other labourers – **** (Labourer not involved in bricklaying)****

3.4.4.2.1.3 Tasks established by the contractor must be such that:

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

3.4.4.2.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 3.4.4.1.3

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

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

3.4.4.2.1.5 The Contractor shall endeavor to ensure that the expenditure on the employment of temporary workers is in the following proportions:

- a) 55% women;
- b) 55% youth who are between the ages of 18 and 35; and
- c) 5% (minimum) on persons with disabilities.

3.4.4.2.2 Specific provisions pertaining to SABS 1914-5

3.4.4.2.2.1 Definitions

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

3.4.4.2.2.2 Contract participation goals

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

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

3.4.4.2.2.3 Terms and conditions for the engagement of targeted labour

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

3.4.4.2.2.4 Variations to SABS 1914-5

3.4.4.2.2.4.1 The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

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

3.4.4.2.2.5 Training of targeted labour

- 3.4.4.2.2.5.1 The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.
- 3.4.4.2.2.5.2 The cost of the formal training of targeted labour, will be funded from a Provisional Sum as set in the bill of quantities. This training should take place as close to the project site as practical possible.
- 3.4.4.2.2.5.3 The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he she is employed for 4 months or more.
- 3.4.4.2.2.5.4 The contractor shall do nothing to dissuade targeted labour from participating in training programmes.
- 3.4.4.2.2.5.5 An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of 3.2.2.2.5.4 above.
- 3.4.4.2.2.5.6 Proof of compliance with the requirements of 3.3.2.2.5.2 to 3.3.2.2.5.6 must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

3.3 Certification by recognized bodies – See Section E – Project Specifications

3.4 Plant and materials provided by the Employer – N/A

3.5. Services and facilities provided by the Employer – See Section E – Project Specifications PS 7 Page E

3.4 Plant and equipment – See Section E – Project Specifications PS A 4 and for the purpose of Labour-Intensive approach, the following plant and equipment's are recommended for ensuring quality production:

- Compaction of fills using hand operated tampers.
- Borrow pits operations and haulage of materials.

With any other means of ensuring maximum use of local labour and provided that where a maximum size, type or capacity of plant or equipment is indicated above, the plant and equipment utilized by the Contractor shall not exceed that specified for the particular operation without prior consent of the Engineer. Where no maximum size or type of equipment is specified for an operation which is labour-intensive specified or not, the size, capacity and type of mechanical plant or equipment utilized shall be at the discretion of the Contractor.

The plant and equipment used on the site shall not be inferior to that described in the Schedule of Plant and Equipment.

C3.5 Management

3.5.1 Applicable SABS 1921 standards

The following parts of SABS 1921 Construction works standards and associated specification data are applicable to the works:

- 1) SABS 1921-1:2004
- 2) SABS 1921-2:2004
- 3) SABS 1921-6:2004

The abovementioned South African National Standards make several references to the Specification Data for data, provisions and variations that make these standards applicable to this contract. The Specification Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and these standards.

Each item of Specification Data given below is cross-referenced to the clause in the standard to which it mainly applies.

The associated Specification Data is as follows:

SABS 1921-1, Construction and management requirements for works contracts – Part 1: General engineering and construction works	
Clause	Specification data
Essential data	
4.1.7	There are no requirements for drawings, information and calculations for which the contractor is responsible
4.2.1	The responsibility strategy assigned to the contractor for the works is A.
4.3.1	The planning, programme and method statements are to comply with the following: <ul style="list-style-type: none"> • format of programme, • critical path activities and their dependencies, • frequency of updating,
4.3.3	The notice period for inspection is 5 Days
4.7.3	The overbreak allowances for blasting are provided in the scope of work.
4.9.3	The trees and shrubs which are not to be disturbed are identified in the scope of work.
4.12.2	The samples of materials, workmanship and finishes that the contractor is to provide and deliver to the employer are: <p>1) concrete works 2) masonry works</p>
4.14.3	The office accommodation, equipment, accommodation for site meetings and other facilities for use by the employer and his agents are: <p>1) Site office which shall be used for site meetings and for the contractor's use. Such an office shall comprise a minimum of 20m² in area and 3 m high, be ventilated, have good lamination, must be reasonably sound proof, and have a hard floor construction. It shall be furnished with a desk on which drawings can be rolled open and on which there is sufficient writing space and sufficient temporary chairs or benches to accommodate all persons present at site meetings.</p>
4.14.5	The Contractor is required to provide latrine and ablution facilities.
4.14.6	The requirements for the provision and erection of separate sign boards for consultants and subcontractors are: <p>1) The boards must comply with the official standard type signboard of the Employer and be at least 2750 x 1800 mm high.</p> <p>2) The boards must be constructed with a firm flat exposed face using suitable material of firm construction, painted and lettered according to the standard drawings available from the Employer on request and mounted on sturdy pipe-standards at a height of 1800 mm above natural ground level.</p>
4.17.1	The requirements for the termination, diversion or maintenance of existing services are: <p>1) Water 2) Electricity</p>
4.17.3	Services which are known to exist on the site are: <p>1) Water 2) Electricity</p>

Additional clauses

1. Site meetings and procedures

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

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

2. Water:

The Contractor is to provide, and remove and make good upon completion, all the necessary temporary plumbing connections and purchase water from the local authority for the works at his own cost.

3. Electricity:

The Contractor is to provide, and remove and make good upon completion, all the necessary temporary electrical connections and installations and purchase electricity from the local authority / Eskom for the works at his own cost.

3.5.2 Particular / generic specifications

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

3.5.3 Recording of weather

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

3.5.4 Unauthorized persons

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

3.5.5 Management meetings

Site meetings will be held on monthly basis. The following parties are required to attend these meetings: the Employer's Representative, the Engineer and/or Representative, the Contractor and/or Representative, the Community Liaison Officer, the Health and Safety Officer and all members of the Project Steering Committee.

3.5.6 Forms of contract administration

These forms will be issued to the Contractor as required.

3.5.7 Electronic payments

Proof of all electronic payments must on request be supplied to the Employer.

3.5.8 Daily records

All accidents and incidents shall be recorded daily in a site diary. Apart from the site diary the Contractor shall provide a site instruction notebook for use by the Engineer. The notebook shall be signed by both the Engineer and the Contractor whenever a site instruction is issued by the Engineer.

3.5.9 Payment certificates

Contractor to submit claims for all the work done. All claims are subjected to verification by the Engineer.

3.5.10 Permits

Contractor to ensure that no unauthorised persons are permitted to site.

3.5.11 Proof of compliance with the law

Contractor to submit copies of the CIDB Registration and the Company Registration Certificates

C4. Project Specification

SCOPE

The project specification is set out in two parts. Portion 1 covers a general description of the project, the facilities available, and the requirements to be met. Portion 2 covers variations and additions to the standardized or specifications that are applicable to the contract.

The numbering method in Portion 2 of this project specification deviates as follows from the method suggested in Code of Practice SABS 1200.

Each clause with the prefix PS shall refer to the congruent clause in the appropriate section of the standardized or specification. Such clause shall either substitute, or supplement, or amend the clause with the same number. Where there is no such congruent clause in the standardized or specification, the PS clause shall be a new clause in the project specification. Any clause that is referred to in the standardized specification will also include the appropriate specification.

PROJECT SPECIFICATION

PORTION 1: THE WORKS

PS 1 GENERAL DESCRIPTION OF WORKS

This contract entails the construction of the following:

Protection of existing services.

Housing and re-equipping of existing boreholes.

Construction of a reverse osmosis packaged water treatment plant with a treatment capacity of 1000kl/d.

Connecting to the existing Moihoké 600mm diameter pipeline.

Excavate, lay, bed, test and disinfect approximately 67900m of uPVC pipelines (rising mains, gravity mains and distributor mains).

Install valves and associated valve chambers.

Installation of pump in clean water sump at packaged plant.

Demolish reservoirs that are beyond state of repair.

Construction of fences.

Supply and install telemetry system complete as per the specification on page 152 of this document

Design, supply and install a 22kv line complete with transformers as per specification on page 152 of this document.

Tenderers must note that certain rates in this tender are fixed and based on prices that the successful Tenderer shall undertake the complete construction of such installations. Tenderers are also to take note of the fact that the bulk of the works is to be executed by means of labour intensive construction (LIC) methods, where feasible. The execution of the work will be done using the following two methods:

- (i) Established contractor to employ people from the communities where the work is to be done.
- (ii) Nominated emerging sub-contractors, which are to be employed and trained by the established contractor with the assistance of an approved training institution.

The tenderers must take note of the fact that it will be expected of the successful Tender to enter into a formal agreement with the Nominated Emerging Contractors (NEC) and all local labor to be employed on the project. The established/main contractor (MC) will be responsible for the quantity and progress of the work of the nominated emerging contractors.

The work to be carried out during the contract period may be given as separate tasks. Each task to be undertaken will be issued as a written instruction by the Engineer and will consist of a detailed scope of work and relevant drawings for each particular task.

PS 2 DESCRIPTION OF THE SITE AND ACCESS

Refer to the "PART C.6 Site Information".

PS 3 DOCUMENTATION

PS 3.1 The Provisional Bill of Quantities is included in this document and *must be completed and handed in with the tender*.

PS 3.2 The drawings, for tender purposes, listed under Part C3.2 are applicable to this contract.

PS.3 The Tenderer shall check the Bills of Quantities for missing or duplicated pages or drawings and should any be missing or duplicated, or the reproduction be indistinct, or if any doubt exists as to the full intent or meaning of any particulars or description, or this Bill of Quantities contain any obvious errors, the Tenderer shall notify the Engineer at once who shall promptly give a written directive. No liability whatsoever will be admitted in respect of errors in any tender due to the above-mentioned causes.

No alteration, erasure, omission or addition is to be made in the text and conditions of these Bills of Quantities or other documents. Should any such alterations, amendment, note or addition is made, it will not be recognized and the text of the Bills of Quantities or other documents as prepared by the Representative must be adhered to.

PS 3.4 The Tenderer shall examine all documents and shall thoroughly acquaint himself with the nature and extent of the Works and the way they are to be executed as no claim for extra payment in this connection will be entertained

PS4 NATURE OF GROUND AND SUBSOIL CONDITIONS ON SITE

The water table may be relatively high during the summer months and provision must be made for effective draining of excavations.

It is the Contractor's responsibility to supply and deliver all material that complies with the minimum standards as well as for the building and maintaining of access roads to the works on site, haul areas or dumping sites. No additional payment will be applicable to the above-mentioned, other than the relevant items in the schedule of quantities.

No trial holes were dug along the network layout. Note that the prospective tenderers shall acquaint themselves with the nature of materials on site.

PS5 DETAILS OF THE CONTRACT

PS5.1 MAIN CONTRACTS

Work included in this contract involves the scope of work as per paragraph PS1.

The other main components of the work under this contract are:

- a) Establishment of the Contractor's camp.
- b) Site clearance and earthworks.
- c) Provision of all materials, special fittings and accessories as required, to complete the work as prescribed.
- d) Excavation and backfill compacted as specified, or pipe trenches and the removal of all excess material.
- e) Laying, bedding and installation of all pipes and accessories.
- f) Concrete work associated with the above-mentioned equipment.
- g) Construction of concrete anchor blocks associated with the above.
- h) Commissioning of the works.
- i) Maintenance on the works for a twelve-month period.

PS6 CONSTRUCTION PROGRAM AND METHODS

The construction site is situated in a built-up area; the Contractor shall ensure the least disruption of movement of the public during construction.

Construction methods must be of such a nature that no property or life is endangered. The Employer accepts no responsibility for work that is done without consent by the Engineer outside the site boundaries. The Contractor himself is responsible for liaison and arrangements with the Local Authority about the finalization and approval of the construction program.

The Contractor is responsible for liaison and the necessary arrangements with the relevant road authorities in respect of the finalization and approval of the works programme.

Sufficient photos of existing structures, walls and areas that have to be crossed must be taken by the Contractor and handed over to the Engineer before such operations commence. No payment will be made in this regard and it shall be deemed to be covered in the Preliminary and General Items.

Local laborers must do the trench preparation, bedding, laying and backfilling of pipes and fittings. The contractor is responsible to liaise with the Labor Desk for labourers.

No separate payment shall be made for any arrangements with relative local authorities for closing off the current water supply or for the distribution of notices to the public.

The compilation of the construction programme and any arrangements thereto during construction shall be at the cost of the Contractor and shall not be measured elsewhere in this contract. The contract must be completed within the time specified in the "Contract Data" of this document, excluding the builder and public holidays.

PS7 SITE FACILITIES AVAILABLE

PS7.1 SOURCES OF WATER SUPPLY, POWER SUPPLY, SANITATION AND ACCOMMODATION

Water for construction purposes will be for the account of the contractor at the ruling tariff and will be supplied at a suitable point, from where the contractor will be responsible to convey the water to the point of usage. Water for human consumption will be from the existing network at the ruling tariff. Electrical power is available from the existing reticulation at ruling tariffs. The Contractor shall make his own arrangement for any water or power he may require. Any extension of time due to delays resulting from these facilities will not be granted.

The contractor must supply and maintain at his own cost enough portable chemical toilets, one of which must be situated at the campsite and the rest in the area of the site.

No waste or sludge must be left uncovered until it is removed. The contractor must operate an efficient solid waste removal system to the satisfaction of the Engineer for the duration of the contract.

The Contractor must make his own arrangement for communication and a telephone service.

PS7.2 LOCATION OF CAMP AND DEPOT

A site for the Contractor's camp and a depot will be pointed out during the site inspection. No trees may be removed and the contractor must provide his own firewood.

PS7.3 HOUSING FOR CONTRACTOR'S EMPLOYEES

No housing is available for the Contractor's employees, and the Contractor shall make his own arrangements for housing his employees or transporting them to and from the site. The Contractor is in all respects responsible for the housing and transporting of his employees, and for the arrangement thereof, and not extension of time due to any delays resulting from this will be granted.

PS8 SITE FACILITIES REQUIRED

No housing is required for the Engineer. Other facilities such as an office, telephone, name board, survey equipment, etc. required for the Engineer, are described under the relevant sections.

PS9 FEATURES REQUIRING SPECIAL ATTENTION

PS9.1 CONTROL OF WATER

The Contractor is in all respects responsible for the handling of storm water from higher-laying areas adjacent to the works, for the handling of possible sub-surface water and for the handling of spoiled water when disconnecting existing connections or valves. No separate payment shall be made for this, as all costs related thereto shall be deemed to be included elsewhere in the tendered rates.

PS9.2 "AS BUILT DRAWINGS"

As the work progresses, the Contractor shall keep full records of all amendments to and deviations from the drawings as issued to the Contractor at the start of the contract. The true positions, invert levels and ground levels of all services shall be indicated on the drawings, for which purpose the Contractor shall receive a separate complete set of drawings from the Engineer, at no cost.

The completion certificate shall only be issued after the Engineer has received a properly completed set of “AS BUILT” drawings from the Contractor. No separate payment shall be made for this service, as all costs related thereto shall be deemed to be included in the related items.

PS9.3 FINISHING AND TIDYING

Progressive and systematic finishing and tidying will form an essential part of this contract. Under no circumstances shall spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate unnecessarily and in the event of this occurring the Engineer shall have the right to withhold payment for as long as necessary in respect of the relevant works in the area(s) concerned.

PS9.4 SURVEY BEACONS

No setting out of the pipeline route was done. All proposed pipelines shall be parallel (at least 2,5 m away) to the existing yard boundaries. No separate payment shall be made for this, as all costs related thereto shall be deemed to be included elsewhere in the tendered rates.

PS9.5 CONSTRUCTION MODUS OPERANDI

Labour-based or labour-intensive construction may be defined as the economically efficient employment of as much labour as is technically feasible to produce as high a standard of construction as demanded by the specification and allowed by the funding available. In other words, projects based on labour-intensive principles aim at devoting the highest feasible proportion of projects costs to unskilled, semi-skilled and skilled labour without jeopardizing the technical quality of the product demanded by the specification.

The following regulations must be adhered to so as to ensure that the construction methods used are labour intensive:

- (i) The remuneration of local labour for hourly-rated employees and/or daily-based work shall be in accordance with the terms and conditions of the Proclamation R1841 of Government Gazette 16833 dated 24 November 1995 or its latest amendment.
- (ii) The name, identification number, task performed and hours worked per day for each labourer shall be recorded by the Contractor. These records shall be submitted to the secretary of the Project Steering Committee on the second working day of each week following the recounted week.

The employment of local labour must be at least **10%**, of the total contract amount. The 10% must be divided as follows:

Percentage of Labour	Description
55%	Women
55%	Youth (Above school, but under 36)
5%	Disabled persons,

PS9.6 LOCALLY BASED SUB-CONTRACTORS

PS10 TRAINING

PS10.1 General

A suitably capable Training consultant is to be employed on this project. Their duty is to identify suitable persons and train them for the following:

- (i) Employee Training – community based labor.
- (ii) Employer Training – community based contractors.

- (ii) Committee Training – maintenance and operation of the Works (this however falls outside the scope of this Contract) This project is a project using community-based labour and community based contractors as far as possible.

The Contractor using the necessary plant and labour as he sees fit shall carry out conventional construction. However, the Contractor may only bring in key staff from outside the area that has the necessary skills not available among the local community. Other than key staff, all other labour must be employed from the local communities. As a guideline, key staff would include general foreman, foreman, site managers, buyers, quantity surveyors, etc.

The Training Consultant will provide the necessary training so that the local labourers will have the necessary skills to carry out this work. In this respect, the contractor and the Training Consultant must work closely together to identify what skills are required, how many labourers in each trade are required and when this labour will be required, so that the necessary training can be given timeously.

Typical training that is envisaged at this stage includes shuttering, concrete work, reinforcing, team leaders, etc. The other part of the Contract is work that will be carried out by community-based contractors.

The Training Consultant will identify persons, with the assistance of the Project Steering Committee, and training these persons to establish small community based contracting firms, who will employ local labour. These firms will tender to carry out this work and successful Tenderers will be appointed by the Contractor as nominated sub-contractors to execute this work.

Typical training that will be given by the Training Consultant is:

- (i) Community based contractors
 - Preparation phase – using a calculator, numeracy, using a scale ruler, reading a building plan, handling administrative tasks in the building industry.
 - Estimating and tendering – marketing the services of a company, seeking, site selection, collecting and studying tender documents, investigating and assessing a site, developing a bill of quantities from building plans, calculating the cost of a project, finalizing tender prices, completing and submitting a tender.
 - Project planning – introducing to planning techniques, pre-tender planning, planning contract activities, contract planning, executing a contract programme.
 - Executing the project – managing the finances of the company, managing materials, administering record systems, managing manpower, completion and handover.

- (ii) Community based labour

Local labour will be taught the following skills:

Selected backfill and backfill
Concrete mixing, plastering
Bricklaying

Again, the Contractor, Employees' Representative, Training Consultant will have to work closely together to identify what their requirements are and when this labour is needed.

Community based labour training will take place at a central point. The Provisional Sum allowed in the Schedule of Quantities, for the training of community based contractors.

PS10.2 Construction and Materials Management

This section applies only to work to be carried out by community based contractors.

The Contractor shall provide construction and material management to the community-based contractors. In this respect, each party has the following responsibilities.

- (i) Community Based Contractors

- ▮ To tender on the labour-based sub contract work and enter into a contract with the Contractor.
- ▮ To carry out the work according to specification and on time using community based labour.
- ▮ To liaise and cooperate with the contractor regarding specifications, programme, progress, delivery of material, quality of work, etc.
- ▮ To provide wheelbarrows, hand tools, clothing, safety equipment, etc. to enable his labourers to carry out the work. All material (pipes, fittings, valves, etc) to be provided by the Contractor.
- ▮ To receive material required for the task, store it and provide the necessary security until the material is built into the works.
- ▮ To provide the necessary transport for this labour force.
- ▮ To carry out a task in its entirety until final product approval and acceptance. In other words, there will be no split responsibility. For example, a community based contractor will excavate, provide the selected backfill, brickwork.
- ▮ To pay his labourers, VAT, etc. and finalize the final account.

(ii) Contractor

- ▮ In conjunction with the Training Consultant, establish the needs, training and programming of the work.
 - ▮ To assist the Training Consultant in drawing up the agreement of association between the Contractor and the community based contractors where applicable.
 - ▮ To enter into nominated subcontracts with the community based subcontractors.
 - ▮ To provide the necessary skills transfer and construction management for the community based contractors to successfully complete this work. This includes setting out of the work, quality control over the work, programming of the work, progress, testing and acceptance thereof.
 - ▮ To provide the necessary materials to execute the work. This includes purchasing the required materials, transporting them to the campsite, storage at the campsite, transporting materials as required from camp site to the sites of the various community based contractors, handing over of materials.
 - ▮ To pay the community based contractors as the work progresses and the Contractor must make allowance in his Tender for this. Retention monies will be as for this contract. No sureties will be required from the communities-based contractors.
 - ▮ To measure the work and finalize the final account.
- Complete copies of the emerging contractors' contracts to be given to the Engineer for endorsement prior to the contract being signed.
- Candidate selection would be according to the requirements for a particular discipline. A Certificate of Achievement should be awarded to a student who has attained a prescribed level of competency.
- A provisional amount for training has been recorded in both sections under the Item "Training" in the Preliminary and General portions in the Schedule of Quantities.

PS11 APPLICABLE STANDARDIZED SPECIFICATIONS

Although not bound nor issued with this document, the following standardized specifications shall form part of the contract and, notwithstanding the provisions of sub-clause 2.2 of SABS 1200A, the editions specified below shall apply:

SABS 1200 A	-	1986	General
SABS 1200 AB	-	1986	Engineer's Office
SABS 1200 C	-	1986	Site Clearance
SABS 1200 DB	-	1989	Earthworks (Pipe Trenches)

PS10.2 Particular Specification

PSVC : Security Fencing (Removal of Fencing) PF : Masonry

The newest editions of the above specifications up to and including the month of this tender will prevail.

PROJECT SPECIFICATION

PORTION 2: VARIATIONS AND ADDITIONS TO STANDARDIZED SPECIFICATIONS

SABS 1200 A: GENERAL

PS A 3 MATERIALS

All the Contractor's suppliers are to be approved and inspected by the Engineer before they are engaged.

PS A 3.1 QUALITY

Where there is a standardised mark programme for any material, all such material supplied shall bear the official standardisation mark. The Engineer's approval is based on tests conducted by the Contractor as required by this Contract.

All materials proposed by the Contractor for incorporation into the work shall where required, be tested in accordance with the Specification. The Contractor is responsible for the cost of all testing to ascertain that the materials do comply with the relevant minimum requirements and all such costs shall be deemed to be included in the tendered rates. The cost of control tests done by the Engineer and for which the result to not comply with the minimum requirements shall be for the Contractor's account.

All test results shall be submitted to the Engineer for approval prior to such materials being built into the works. No material shall be built into the works without such approval. All costs involved in this testing shall be deemed to be included in the rates tendered.

The Contractor shall inform the Engineer of any control testing to be done at least 48 hours before such tests are required and must allow in his program for the time necessary for the tests and the processing of the results thereof.

The handling, storage, transport and erection of equipment, machinery and materials shall be strictly in accordance with the requirements of the supplier and/or manufacturer.

All materials shall be new and of the best quality available unless otherwise specified. They must function satisfactorily under the prevailing climate and weather conditions at the place of installations.

The Contractor is totally responsible for the implementation of an approved QA system equivalent to ISO 9000.

The system shall be submitted to the *Engineer* for approval within 14 days of the start of the Contract and shall define methods to ensure that all necessary quality standards are attained. The *Engineer* will audit the applications of the QA system on a regular basis during this Contract.

PSA 4 PLANT

All plant provided by the Contractor for the execution and maintenance of the works shall be of a character comparable with the scope of the works.

The *Contractor* shall provide and maintain sufficient plant to meet all contractual requirements and shall not remove any of this plant from the site without the written permission of the *Engineer*. He shall, however, remove unsuitable, obsolete or worn-out plant from the site when ordered to do so by the *Engineer* and replace these with plant approved by the *Engineer*.

The approval of any plant on the site by the *Engineer* shall in no way relieve the *Contractor* of any of his obligations under the Contract.

PS A 4.2 Contractor's Offices, Stores and Resources

Add the following to A 4.2:

No housing is available for the Contractor's employees and the contractor must make his own arrangements for accommodation and transport of his employees.

PS A 4.3 Hand Tools

The contractor shall provide and maintain all hand tools required for the execution of the Works.

PS A 5 CONSTRUCTION

On completion of the scope of work associated with each construction drawing, the *Contractor* shall provide a marked-up "as-built" copy of the drawing. These drawings shall incorporate all changes, amendments and additions that have occurred and the drawings shall be signed by the *Contractor's* representative and submitted to the *Engineer* for signature and acceptance.

Where surveying is necessary to determine as-built conditions, the *Contractor* shall provide a land surveyor on Site to undertake the as-built survey within 24 hours of being so instructed by the *Engineer*.

PS A 5.1. SURVEY

PS A 5.1.1 Setting out of the Works

Substitute the first sentence in A 5.1.1 with the following:

Setting out of the work is the sole responsibility of the Contractor and shall be done from the layouts given to him. The proposed network pipes must be placed 2,0m away from the ERF boundaries in the road reserve. Any discrepancy shall immediately be reported in writing to the Engineer. Any costs or subsequent costs arising from discrepancies, which had not been reported to the Engineer, shall be the sole responsibility of the Contractor. *The exact position of the network pipes shall be determined on site in conjunction with the Engineer and must be approved before construction of the specific section starts.*

The Engineer may alter any part of the works to suit the local conditions. The Contractor must therefore contact the Engineer immediately after the preliminary setting out of any part of the works before starting with detail setting out, or construction. Only after the Engineer has approved a specific site or part of works, may the detail setting out and construction commence.

PS A 5.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS

Add the following to A 5.2.

The crossing of existing tar and dirt roads must be done in half widths, while the total traffic is accommodated on the other lane.

Road traffic signs shall comply with the requirements of the "South African Road Traffic Signs Manual" and shall be approved by the Engineer before construction commences.

PS A 5.6 TRANSPORTING OF MATERIALS

Where the transporting of materials outside of the site is such as to generate a nuisance, the material shall be covered during transport.

Precautions shall be taken during the transporting of muddy and other materials to prevent its fouling completed construction or roads.

Any rock or debris falling from trucks on to roads shall be removed immediately.

Access Roads to Site - The **Contractor shall keep in good and constant repair all access roads to and on the site.**

Any route that the *Contractor* wishes to use to the place where water is obtained or any other route that is used by the *Contractor* shall be subject to approval by the *Engineer*.

All the *Contractor's* vehicles on the Site must be in a roadworthy condition. The number of the *Contractor's* vehicles on the Site will be subject to approval by the *Engineer*.

PS A 7 TESTING

PS A 7.1 APPROVED LABORATORIES

The Contractor may appoint an accredited independent testing laboratory to the approval of the Engineer. The Engineer shall be given free access to any appointed laboratory.

PS A 7.4 STATISTIICAL ANALYSIS OF CONTROL TESTS

Substitute A 7.4 with the following:

Test results shall not be evaluated by statistical methods. All results shall comply with the specified minimum requirements of the materials concerned.

PS A 8 MEASUREMENT AND PAYMENT

PS A 8.1.2.3 The Contractor to Price all Items

In addition, the *Contractor* shall provide a detailed schedule itemising the breakdown of each item listed in the Preliminary and General section of the Schedule of Quantities, in terms of all personnel, plant, structures, facilities etc. not covered by the construction rates elsewhere in the schedule. The rate for each item in the detailed schedule shall cover all direct and overhead costs, profit and all other costs for provision of the item.

PS A 8.2 PAYMENT

PS A 8.3 Fixed Charge and Value-Related Items

PS 8.3.1 Contractual Requirements Unit: Sum

The sum shall cover the Contractor's initial costs of providing sureties, insurance of the works and plant, third party or public liability insurance and unemployment insurance to cover his compliance with the requirements of the Workmen's Compensation Act, 1941 (Act No. 30 of 1941) and any other initial financing obligations of a preliminary and general nature, such contributions of the CEITB.

The tendered amounts for fixed charge and value related items will not be increased, if extension of time for the completion of the works is awarded.

PS A 8.3.2 Establishment of Facilities on the Site

PS A 8.3.2.1 Facilities for Engineer

- a) Furnished office (No) Unit: Sum
- b) Nameboards (1 No) Unit: Sum
- Provision for Engineer’s electrical and electronic equipment.....Unit: Prov Sum
- Provision for Engineer’s rented accommodation.....Unit: Prov Sum

PS A 8.3.2.2 Facilities for Contractor

- a) Offices, workshops and storage sheds Unit: Sum
- b) Living accommodation Unit: Sum
- c) Ablution and latrine facilities Unit: Sum
- d) Access Unit: Sum

PS A 8.3.3. Other Fixed Charge Obligations

This item as listed under Schedule A of the Bill of Quantities is as specified in the standardized specification SABS 1200 A.

PS A 8.3.4 Removal of Site Establishment

The sum shall cover the cost of the demolition on and the removal from the surface of the site of all items established in terms of 8.3.2 and 8.3.3, and shall provide for the making good and the restoring of the site to the satisfaction of the Engineer.

PS A B 8.3.5 OCCUPATIONAL HEALTH AND SAFETY

PS A B.8.3.5.1 Contractor's initial obligations in respect of the Occupation Health and Safety Act and Contractual RegulationsUnit: Sum

The amount will be paid on the scheduled rate on condition that:

- (a) The contractor has fulfilled the requirements for Construction Work Permit.
- (b) The client’s Agent has approved the contractor’s Health and Safety Plan, Risk Assessments, adequate provision for the cost of Health and Safety measures. (Including cost for Covid 19 Management)
- (c) The contractor has set up his Health and Safety File.
- (d) The contractor has appointed a Registered Construction Health and Safety Officer (SACPCMP).

The provisional sum shall represent full compensation for that part of the contractor’s general obligations in terms of Occupational Health and Safety Act and the Construction Regulation 2014 which are mainly a function of time. The sum for the supply of all safety clothing, first aid kit, etc. in order to adhere to the occupational Health and Safety Act specifications. The Contractor must familiarize himself with the conditions as per Occupational Health and Safety Act and adhere thereto. The rate shall cover the Contractor’s overheads, changes, and profit payments for the service Provider. Contractor to note that this item covers the costs for the preparation and submission of Health and Safety plan and file.

Payment shall be as specified for item 1.3 in the standard specifications.

PS A B.8.3.5.2 Occupational Health and Safety Act Unit: Sum

Handling cost in respect of sub-item 8.3.5. A percentage of the payment made to the Occupational Health and Safety Act will be paid to the contractor under this section. The rate shall cover the Contractor’s overheads, changes, and profit on payments for the Occupational Health and Safety Act.

- (a) **Provision of Full time Registered Construction Health and Safety Officer (SACPCMP).**

The Contractor should appoint a Registered Construction Health and Safety Officer (SACPCMP).who will be fulltime responsible for all safety issues on site, and he or she should be fulltime on site.

The tendered rates include the full compensation for that part of the provision of Full time Registered Construction Health and Safety Officer (SACPCMP) in terms of the Occupational Health and Safety Act and the Construction Regulation 2014 which are mainly a function of time. Payment shall be made monthly.

- (a) Handling cost in respect of sub-item 8.3.5.2 (a). A per percentage of the payment made to the Safety Officer will be paid to the Contractor. The rate shall cover the Contractor's overheads, changes and profit on payments for the Safety Officer.

PS A B.8.3.5.3 Contractor's time related obligation in respect of the OH & S Act and Construction Regulation 2014

The tendered lump sum shall represent full compensation for that part of the contractor's general obligations in terms of Occupational Health and Safety Act and the Construction Regulations 2014 which are mainly a function of time. The lump sum will be paid monthly only after payment for item 1.3.3 and item 1.1.5 has been made. Payment of the lump sum shall be made monthly (calculated by the division of the lump sum by the number of months remaining).

Bidder should attach a mini BOQ for Occupational Health and Safety provision

PS A 8.2.2 Time-Related Items

The tendered amount for a time-related item will be increased; if any extension of time for the completion of the works is awarded on the condition that the activity related to the item tendered for must be sustained during the extended period.

The ratio between the increased amount for a time-related item and the tendered amount must be the same as the ratio between the extension of the time period for the completion of the works and the original time period allowed for completion of the works.

If the works is completed before the end of the original time period allowed for completion of the works, the tendered amount of time related item that is influenced by the earlier completion would be reduced similarly.

PS A 8.4 SCHEDULED TIME RELATED ITEMS

PS A 8.4.2.1 Facilities for Engineer

- a) Furnished offices Unit: Sum
- b) Telephone for engineer's representative Unit: Sum

PS A 8.4.2.2 Facilities for Contractor

The sum shall cover the Contractor's initial costs of providing sureties, insurance of the works and plant, third party or public liability insurance and unemployment insurance to cover his compliance with the requirements of the Compensation for Occupational Injuries and Diseases Act (No 130 of 1993) (COIDA) and any other initial financing obligations of a general and preliminary nature, such contributions to the CEITB. Establishment of Facilities on the Site Facilities for Engineer.

PS A 8.4.3 Supervision for Duration of Construction

The sum shall cover the costs of on-site supervision and such local administration as the Contractor considers necessary for the proper completion of the Works, and shall cover the cost of the salaries, wages and allowances paid to the site agent, general foreman, section foreman (where applicable), site surveyors, timekeepers, assistants and other site supervisory staff, and of transport incurred in connection with such staff. Plant (designated plant or plant for designated operations or plant for use during Supervision for Duration of Construction)

PS 8.4.4. Company and Head Office Overhead Costs for the Duration of the Contract Unit: Sum

The sum shall cover the contractor's company and head office overhead costs.

PS A 8.5 SUMS STATED PROVISIONALLY BY ENGINEER

PS A 8.5. (a) 1 Community Liaison Officer

Unit: Sum

The Contractor must pay a salary to a person appointed as the Community Liaison Officer for the project. The amount of payment and payment dates will be determined as soon as the Community Liaison Officer is appointed.

PSA 8.5(a) 2 PSC Meetings Attendance

Unit: Sum

The tendered rate shall cover the compensation of all members of Project Steering Committee for attending meetings. The amount of payment and payment dates will be determined on the commencement date of the project. The Engineer should authorize payment before it is made. Proof of payment has to be submitted to the Engineer before claim can be certified.

PS A 8.5(a) 3 Overheads, Charges and Profit on (1) above

1%

Handling costs and profit in respect of sub-item 8.5 (a) 1 & 1. A percentage made to the Community Liaison Officer and PSC Meeting attendance will be paid to the contractor. The rate shall cover the Contractor's overheads, charges and profit on payments for the Community Liaison Officer and PSC members.

PS A 8.5(b) 1 Training Entrepreneurial

Provisional sum for training services supplied by the Training Company. The name and contact details of the Training Company, to be appointed by the Contractor, will be supplied to the Contractor by the Employer or Engineer.

PS A 8.5(b) 2 Overheads, charges and profit on (1) above

Handling costs and profit in respect of sub-item 8.5 (b) 1. A percentage of the payment to the Training Company will be paid to the Contractor. The rate shall cover the Contractor's overheads, changes, and profit on payments for the Training Company. No payment will be made under this item before any payment is made to the Training Company.

PS C 8.5 EXISTING SERVICES

The services parallel to the pipeline routes must only be removed and re-erected at the positions as indicated and approved by the Engineer and repaired where it was damaged. When the pipeline routes across the fencing or gates temporary wire gates must be provided that must be kept closed. After completion of the work these fences or gates must be repaired to the same condition as before commencement of the work.

PS A 8.5(c)2 Overheads, changes and profit from (1) above

Unit: %

Handling cost in respect of sub-item 8.5 (c) 1. A percentage of the payment made to the service provider will be paid to the Contractor. The rate shall cover the contractor's overheads, changes, and profit on payments for the Service Provider.

PS A 8.7 DAYWORK

Replace A 8.7 with the following:

Daywork will be paid according to the percentage allowance method. For calculating the total remuneration, the General Conditions of Contract for Construction Works, Second Edition, 2010 shall apply, with the amendments as in the appropriate special conditions of contract, which is bound into this document. A daywork schedule will be provided for filling in the necessary information.

A 8.8 TEMPORARY WORKS

PS A 8.8.2 Accommodation of Traffic

Unit: Sum

Add the following to A 8.8.2:

The rate shall cover all costs pertaining to the provision, erection, moving and re-erection and maintenance of all temporary barricades, road signs, lights, flagman, etc. as required for the guarding and protection of the works, for the construction, gravelling and maintenance of access roads and detours to the site of the works, borrow pits or spoil sites, as well as for the later removal or the cleaning and tidying up thereof.

A 8.9 ITEMS NOT SCHEDULED SEPARATELY OR INCLUDED IN SCHEDULE OF QUANTITIES

The *Contractor* shall describe and price any other work described in the Specifications or appearing on the drawings, which is not scheduled separately or included in the Schedule of Quantities and for which he desires to enter a separate charge. If no separate charge is made thereunder then the scheduled items shall be held to include all costs for such work or obligations for the execution of _____ the _____ works.

PROJECT SPECIFICATIONS

PORTION 2: VARIATIONS AND ADDITIONS TO STANDARDIZED SPECIFICATIONS

SABS 1200 AB: ENGINEER'S OFFICE

PS AB 3 MATERIALS

PS AB 3.1 NAME BOARDS

Substitute "South African Institution of Civil Engineers" in the first paragraph of AB 3.1 with "South African Association of Consulting Engineers".

PS AB 3.2 OFFICE BUILDING

Replace AB 3.2 with the following:

Prior to commencing with work, contractor shall provide and furnish for the use of the engineer's representative and his staff one office (3.0 x 4.5m Wendy House Type with a veranda) in an approved position. The Engineer will indicate the position. All plans shall be submitted to the Engineer for approval before the commencement of erection.

The office with a minimum floor area of 13.50m² (the smaller dimension at least 3.0m) with a ceiling height of minimum 2.1m, shall also have one toilet apart from the office building for the exclusive use of the Engineer's Representative.

The Office shall be provided with lined walls and boarded ceilings and floor and suitable door with secure locks. The office shall be ventilated, weather proof and water proof and shall have windows with an area of at least 20% of the floor area. The office shall be insulated to provide comfortable working conditions.

Internal furnishings shall include:

- One desk (1.5m long x 1.0m wide x 0.9m high) with lockable drawers with keys.
- One drawing table
- Eight desk chairs
- One table (2.0m long x 1.0m wide x 0.9m high) with smooth top.

PS AB 4 PLANT

PS AB 4.1 TELEPHONE AND FAX

Replace AB 4.1 with the following:

The Contractor shall supply the Engineer with a cellular telephone service for the exclusive use of the Engineer and the Engineer's Representative for official purposes for the duration of the contract.

PS AB 5 CONSTRUCTION

PS AB 5.1 NAME BOARDS

The name boards shall be erected within a month of the commencement date of the contract and shall be placed at the position indicated by the Engineer. Any damage to these boards shall be repaired within seven days of a written instruction issued by the Engineer. No payment shall be made in terms of the contract prior to the erection of the name boards.

The contractor will be permitted to erect a maximum of two of his own name boards, in positions approved by the Engineer. The Engineer reserves the right to order the removal of these boards if they are not kept in good repair.

PS AB 5.5 SURVEY ASSISTANTS

Substitute “two or more suitably educated survey labourers” in the first sentence of PS 5.5. with “two semi-skilled labourers.”

PS AB 5.6 SURVEY EQUIPMENT

The Contractor shall provide the following tested and approved survey equipment on site for the duration of the contract and for the use of the Engineer whenever needed:

- (a) One tachometer capable of reading to minimum 20 seconds and a maximum of 6 seconds of arch, plus tripod;
- (b) One automatic level plus tripod;
- (c) Two tachometer staffs and one level staff, all graduated metrically;
- (d) One 5m and one 100m tape measure; and
- (e) Diverse surveyor’s necessities like paint, pegs, etc.

The above-mentioned equipment may by arrangement be shared between the Contractor and the Engineer’s representative.

The Contractor shall keep the equipment continuously insured against any loss, damage or breakage, and he shall indemnify the Engineer and the Employer against any claims in this regard.

The Contractor shall maintain the equipment in good working order and keep it clean throughout the contract period.

PS AB 8 MEASUREMENT AND PAYMENT

PS AB 8.2 PAYMENT

PS AB 8.2.2. (a) Office Buildings Unit: Sum

The rate shall cover all time-related costs pertaining to the office building as prescribed in PS AB 3.2

PS AB 8.2.2(b) Telephone and Fax Unit: Sum

The rate shall cover all time-related costs pertaining to the telephone and fax as prescribed in PS AB 4.1

PS AB 8.2.2(c) Name Boards (2 off) Unit: Sum

The rate shall cover all time related costs pertaining to the name board/s as prescribed in PS AB 5.1

PS AB 8.2.2.(d) Survey assistance and equipment Unit: Sum

The rate shall cover all time-related costs pertaining to the survey assistants and equipment as prescribed in PS AB 5.6

PROJECT SPECIFICATION

PORTION 2: VARIATIONS AND ADDITIONS TO STANDARDIZED SPECIFICATIONS

SABS 1200 C: SITE CLEARANCE

PS C 3 MATERIAL

PS C 3.1 DISPOSAL OF MATERIAL

Substitute the first sentence of C 3.1 with the following:

Material obtained from clearing and grubbing shall be disposed of at the site indicated at the site inspect. If such a site is indicated at the tender stage, the cost of transporting material and debris will be included under 8.2.1.

Loading and off-loading should be done by hand and the contractor must price accordingly under item 8.2.1.

PS C 5 CONSTRUCTION

PS C 5.1 AREAS TO BE CLEARED AND GRUBBED

Substitute the first sentence of C 5.1 with the following:

Unless otherwise indicated by the Engineer, clearing and grubbing are limited to a 2,5m wide strip along the pipe route. Measurement and payment for clearing and grubbing shall only occur for areas as required in writing by the Engineer.

The Contractor may proceed with clearing and grubbing after the handing over of the site.

PS C 5.2 CUTTING OF TREES

PS C 5.2.3 Preservation of Trees

PS C 5.2.3.2 Individual Trees

Add the following to C 5.2.3.2:

Trees outside pipeline routes must be left standing and undamaged, except where otherwise ordered in writing by the Engineer.

A penalty of **R15 000,00** per tree for trees damaged and/or removed will be charged.

PS C 5.3 EXISTING FENCING

The fencing parallel to the pipeline routes must only be removed and re-erected at the positions as indicated and approved by the Engineer and repaired where it was damaged. When the pipeline routes cross fencing or gates temporary wire gates must be provided that must be kept closed. After completion of the work these fences or gates must be repaired to the same condition as before commencement of work.

PS C 8 MEASUREMENT AND PAYMENT

PS C 8.2 SCHEDULED ITEMS

PS C 8.2.1 Clear and grub (1.0m wide)

Unit: m

The removal of all rocks and boulders on site over 0.15 m³ will be paid under sub-clause D 8.3.2 (b). The removal of hard rocks other than boulders will be paid under the sub-clause PS DB 8.3.2 (b).

PS C 8.2.2 Remove and grub large tree stumps of girth

- a) Over 1m and up to and including 2m Unit: No.
- b) Over 2m and up to and including 3m Unit: No.

The girth of a tree or stump will be measured at the narrowest point of the tree or stump in the first meter of its height above ground level. Trees and stumps of girth exceeding 1m will be measured individually and classified according to site in increments of 1m as indicated above.

The rate shall cover the cost of clearing and grubbing trees and stumps of all sizes, cutting branches, backfilling holes, and removing, transporting, and disposing of all such trees, stumps, and branches and associated material.

PS 8.2.3 Remove and grub all trees and tree stumps regardless of girth Unit: No

In exceptional circumstances, where construction is carried out through plantations or where the quantity of trees or girth exceeding 1m renders individual measurement impracticable the Project Specification may provide that clearing and grubbing of trees be measured in hectares. If this method of measurement is used the areas to which it is applicable will be defined clearly on the drawings and the reason for adopting the method of measurement will be stated in the project specification.

The rate shall cover the cost of all operations specified in 8.....2.2.

PS C 8.2.5 Take down existing fence

The rate shall cover the cost of taking down the fences, coiling wire and stacking all material at sites indicated by the Engineer and the cost of loading, transporting and offloading such material.

PROJECT SPECIFICATION

PORTION 2: VARIATIONS AND ADDITIONS TO STANDARDIZED SPECIFICATIONS

SABS 1200 DB: EARTHWORKS (PIPE TRENCHES)

PS DB 1 SCOPE

This specification covers earthworks for trenches for all types and sizes. It covers excavation, the preparation of a trench bottom, backfilling and the reinstatement of surfaces.

PS DB 3 MATERIALS

PS DB 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PS DB 3.1.1 Method of Classifying

Substitute DB 3.1.1 and D.B.3.1.2 (a), (b) and (c) with the following:

The Engineer shall classify excavated materials as Soft Class and Rock will be measured individually as extra-over items.

TABLE 1: CLASSIFICATION OF MATERIALS

CLASSIFICATION	DESCRIPTION
Soft	All material other than rock
Rock	Material which cannot be economically fragmented and loosened for removal by hand implements and pneumatic tools, except by drilling and blasting or the use of rock breaking equipment.

In the first instance, the classification shall be based on the descriptions given in Table 1. In the event of disagreement between the Contractor and the Engineer, the Engineer shall reclassify the material in accordance with the relevant specifications and without being unreasonable to the Contractor. The decision of the Engineer on the classification shall then, subject to the provisions of the contract, be final and binding.

The Contractor shall notify the Engineer of the presence of what he considers to be rock immediately upon discovery thereof. The Engineer will inspect the material and decide whether or not it warrants the use of pneumatic tools or rock breaking equipment. In the case of isolated boulders set in a soil matrix, the Engineer may order the Contractor to either widen the excavation or roll the boulders sideways or lift the boulders out of the trenches.

In the event that the Engineer decides that the use of pneumatic tools, rock breaking equipment, or blasting is necessary, he will classify the material accordingly and arrange for the quantity thereof to be measured. The Construction Manager will supply necessary pneumatic equipment and arrange for others to break up rock into manageable pieces.

PS DB 3.1.2 Classes of Excavation (Sub clause 3.1.2)

Omit all of Sub clause 3.1.2 and add the following:

The excavation of materials will be classified as follows for purposes of measurement and payment.

Rock - shall mean materials found in ledges or masses, in its original position which in the opinion of the *Engineer* would have to be loosened by blasting or by pneumatic tools, or, if excavated by hand, by wedges and hammers. Naturally occurring boulders or detached pieces of material conforming to the above definition will not be classified as rock unless they exceed 0,2m³ in volume.

Topsoil - shall mean the upper layer of soil which, in the opinion of the Engineer is capable of sustaining vegetable growth.

Common - shall mean all materials not included in rock or topsoil.

PS DB 3.5 BACKFILL MATERIALS

- a) Substitute "from trenches" in DB 3.5(a) with "from trenches and street excavations".

Add the following to DB 3.5 (b)

- b) Road crossings, access to services, farms and camps and any section that fall within the road reserve shall be classified as areas subject to loads from road traffic and must be compacted accordingly to the top of the trench (natural ground level).

PS DB 3.7 SELECTION OF MATERIAL FOR REPAIR WORK

If the excavation of a pipeline damages and existing road surface, the Contractor must stockpile material from the top 200mm of such a road surface to reuse it as sub base for the repairing of the road crossing.

If necessary gravel material that is suitable for the reparation of road surfaces must be imported.

The Contractor must make provision in his tariffs for compaction in road reserves for the selection of excavation material as specified above.

PS DB 4 PLANT

PS DB 4.1 EXCAVATION EQUIPMENT

Add the following to DB 4.1

An adequate number of suitable tools, including hand stampers, wheelbarrows and hosepipes shall be provided by the Contractor. The Contractor will supply mechanical compaction equipment and when required pneumatic and rock breaking equipment.

All excavations exceeding the specified widths shall be backfilled with approved selected material. No payment shall be made for this and all relevant costs shall be deemed to be included in the tendered rates.

PS DB 4.3 TRANSPORT

Delete the words "normally open to the public" in the second paragraph.

PS DB 5 CONSTRUCTION

PS DB 5.1 PRECAUTIONS

PS DB 5.1.1.1 Water in Trenches

Water in pipe trenches may cause movement of the pipes because of floatation and backfilling must therefore be executed as quickly as possible. If movement of the pipes does not occur the contractor must, unless otherwise instructed by the Engineer, remove pipes from the trench and reinstall it at his own expense.

PS DB 5.1.2.4 Negligence

Any unknown service exposed during Bulk Earthworks is to be reported to the Engineer. Other than the costs involved in repairing damaged services and damage caused by such, no other penalties associated with this clause will be imposed.

Delete “the Contractor will not be required to remove topsoil from any area in which the average depth of soil is less than 150mm”.

PS DB 5.4 EXCAVATION

Add the following to DB 5.4:

“Excavation and backfilling of pipe trenches on sidewalks in the residential area shall be done in such a manner as to ensure the least possible disruption to the public and access to the properties. No additional payment shall be made for this and all relevant costs shall be deemed to be included in the tendered rates.”

PS 5.5 TRENCH BOTTOM

Substitute “90%” in the second paragraph of DB 5.5 with “93%”.

PS DB 5.5.1 Over Excavation of Trenches

Where pipe trenches are excavated deeper than specified or shown on the drawings, these excavations must be backfilled with suitable approved material in layers of not more than 150mm uncompacted thickness and must be compacted to the thickness of the adjoining in-situ material or as prescribed by the Engineer.

PS DB 5.6 BACKFILLING

PS DB 5.6.1 General

Backfilling in road reserves must be compacted in 100mm layers up to natural ground level.

Where prescribed by the Engineer all surplus material must be neatly piled over the real trench width to a height not more than 150mm high than the adjoining level.

PS DB 5.6.3 Disposal of Soft Excavation Material

Add the following to DB 5.6.3:

All surplus and unsuitable material as described in DB 5.6.3 shall be disposed of at the spoil site, (as described in PS D 5.2.2.3) and leveled.

PS DB 5.7 COMPACTION

PS DB 5.7.2 Areas Subject to Traffic Loads

Add the following to DB 5.7.2:

All pipe trenches within road crossings, accesses to services, farms and camps that fall within the road reserve, will be regarded as areas subject to traffic loads. Backfilling of trenches that are subject to traffic loads will be executed in layers of 100mm as follows:

Item	% mod AASHTO	Final Layer Thickness
Approved Backfill	93%	200mm
Main Backfill up to road layers	96%	200mm
Sub-base	97%	200mm
Base	98%	175mm

PS DB 5.9 REINSTATEMENT OF SURFACE

PS DB 5.9.2 Private Property and Commonage

Add the following to DB 5.9.2:

Gardens and lawns shall be repaired to the original standard where they were crossed. Grass and plants shall be taken out of the ground, temporarily stocked, watered during construction and replanted after backfilling.

PS DB 7 TESTING

PS DB 7.1 Taking and Testing of Samples

Determination of the standard of compaction achieved shall be carried out in accordance with TMH 1.

Each layer shall be tested once for every 300m² or part thereof. There shall be at least one test by the sand replacement method for every 20 tests by an approved nuclear device. Procedures for use of nuclear testing devices shall be approved prior to testing

Costs of testing shall be included in the rates for compaction.

PS DB 8 MEASUREMENT AND PAYMENT

PS DB 8.2 COMPUTATION OF QUANTITIES

PS DB 8.2.3 Measurement

Amend the 7th line to read "..... accept the cross sections or an estimate of the quantities provided by the Engineer for"

Earthworks will be measured by volume once only.

Restricted excavations for structure and foundations shall be measured in cut.

Cut to spoil or stockpile operations shall be measured in cut.

Cut to fill operations and borrow to fill operations shall be measured in compacted fill

Computation of Quantities (Sub clause 8.2.3)

PS DB 8.2.4 Shoring

Add the following to DB 8.2.4:

Shoring will only be measured and paid for, if the Engineer gives written approval before it is installed.

PS DB 8.3.2 Excavation

(a) Excavation in all material for trenches, backfill, compact and dispose of surplus material Unit: (m)

Item will be provided for various pipe diameters in steps not greater than those specified in 5.2. and various depths in increments of 1.0m measured to the bottom of the bedding layer (refer to provided drawings). Where measured volumetrically in terms of 8.1.2 (a), the volume of excavation will be computed in accordance with 8.2.2 and 8.2.3.

The rate shall cover the cost of the same operation in heading where the Contractor elects to use such a method of excavation. The volume or length will be measured for payment on the assumption that normal trench excavation has been carried out. The volume or length in the undisturbed prism of material between the top of the tunnel and ground level will be classified as soft excavation in terms of 3.1. No additional payment will be made for such headings and no deductions will be made for reduced excavation quantities.

(b) Extra-over item (a) above for:

- 1. Intermediate excavation Unit: m³
- 2. Hard rock excavation Unit: m³
- 3. Hand excavation and backfill where added by the Engineer Unit: m³
- 4. Soil Crete backfilling where directed by the Engineer Unit: m³

Separate items will not be provided for depth increment, volume will be computed from the trench width determined in accordance with 8.2.3 and the depth from the top of the intermediate or hard rock excavation, as the case may be, either to the bottom of the same material or to the bottom of the trench as specified in (a) above, whichever is the lesser (refer to provided drawings).

The rates shall cover the additional cost of the excavation and hauling of the more difficult material of unsuitable material.

- (c) Excavate and dispose of unsuitable material from trench bottom (provisional) Unit: m³

The volume will be computed from the trench width determined in accordance with 8.2.3 and m³ the additional depth ordered.

The rate shall cover the cost of the excavation of the additional depth in any material, the disposal of the unsuitable material as specified for soft excavation in 5.6.3 within freehaul distance and the backfilling of the additional depth with suitable material from the site of the trench.

PS DB 8.3.3 EXCAVATION ANCILLARIES

PS DB 8.3.3.1 Make up deficiency in backfill material

- a) From other necessary excavations on site Unit: m³
- b) By importation from designated borrow-pits Unit: m³
- c) By importation from commercial or off-site sources selected by the Contractor Unit: m³

Items (b) and (c) above will not be measured for payment unless importation has been ordered in writing. The volume will be computed from the trench width determined in accordance with 8.2.3 and the depth from the top of the backfill to the top of the bedding as shown on drawings or the actual depth of the backfill used to make up the deficiency or the depth of additional excavation in terms of B3.2(c), as applicable.

The rate for material from other necessary excavations on site shall cover the cost of selection of suitable material, the moving of the material to points alongside the trench spaced to suit the contractor’s method of working, and the disposal of the material that is replaced, all within freehaul distance.

The rate of material from commercial or off-site sources selected by the Contractor shall cover the cost of the acquisition of the material (including royalties, if applicable), the moving of the material to points alongside the trench spaced to suit the Contractor’s methods of working, and the disposal of the material that becomes surplus as a result of the importation, all within freehaul distance (see Sub-clause 5.2.5.1 of SABS 1200 D or Sub-clasue 5.2.6.1 of SABS 1200 DA, as applicable).

PS DB 8.3.3.2 Opening up and closing down of designated borrow pit Unit: Sum

This item will only be scheduled when a new borrow-pit has been established or when access to any existing borrow-pit has to be established.

Except for the cost of the removal and spreading back of the topsoil (if scheduled), the sum shall cover the cost of opening up and of restoring the Site as specified in Schedule 5.2.2.2 of SABS 1200 D or Subclause 5.2.2 (f) of SABS 1200 DA, as applicable.

PS DB 8.3.4 Importing materials

The rate for importing materials shall also include for mixing, placing, spreading and compacting as specified on the drawings.

PS DB 8.3.5 Existing Services

Existing services – that intersect or adjoin a Pipe Trench (see Sub-clauses 5.1.2 and 8.3.8 of SABS 1200 D or Sub-clauses 5.1.3 and 8.3.5 of SABS 1200 DA, as applicable).

(a) Services that intersect a trench (angles between center-lines in plan of 45-90°) ... Unit (No)

Except where water pipes are to be recovered, existing water pipes, sewers, stormwater pipes, concrete-lined channels and drains, box culverts, electric cables, ducts, kerbs, channels, erf connections and various sizes of pipes and services that intersect a trench of specified width and require various degrees of care, whether or not their presence is known before they are uncovered, will be measured separately. The unit refers to one service, but services that are so grouped that they can be contained within a horizontal dimension of 200mm measured at right angles to the axis of the services will be measured as one unit.

(b) Services that adjoin a trench (parallel to or at an angle between center-lines in a plan of less than 45°) Unit: No.

In case where a trench of specified width

Runs parallel to or at an angle (in plan) of less than 45° to an existing service, and is such that the nearer side of the bottom of the trench lies at least partly between the vertical plane and a plane that lies at an angle of 45° below the horizontal, both planes passing through the axis of the service, the length of the service within the minimum base width of the trench, determined in accordance with 5.2, will be measured for payment under this item and the remaining length, the side of the trench which, in the opinion of the Engineer, is rendered liable to collapse because of the existence of such service, will be measured for shoring (see 8.3.4 (a)). The rate for an item scheduled in terms of (a) and (b) above shall cover the additional cost of

- (i) Care in excavation necessitated by the presence of such service in or across the trench
- (ii) Protection and maintaining such service in operation by means of temporary supports or shoring, as necessary;
- (iii) Repairs necessitated by damage caused by the Contract.

PS DB 8.3.6 Finishing

PS DB 8.3.6.1 Reinstatement road surfaces complete with all courses Unit: m2

Replace D.B 8.3.6.1 with the following:

a) Gravel Unit: m²

The area will be calculated from the length of finished road and paved surfaces as applicable and with the trench width taken as 0.8m. Payment for finishing will be additional to that for excavation covered by 8.3.2.

The rate shall cover the cost, selective excavation (including the equipment that is required to break up, removed and, if necessary, stockpile the original surface material), and subsequently of reinstating and compaction and shall include the cost of delays and the cost of any risk of having to repair damage as specified in DB 5.10. Compaction to be according to PS DB 5.7.2.

PROJECT SPECIFICATIONS PORTION 2:

VARIATIONS AND ADDITIONS TO

STANDARDIZED SPECIFICATIONS

SABS 1200 GA: CONCRETE (SMALL WORKS)

PSG1 SCOPE

This specification covers the requirements for concrete (plain and reinforced) for small works associated with pipelines, roads, railways, pump stations, etc. It covers the basic materials, the plant formwork required, the quality, manufacture, and curing of concrete, tolerances in workmanship, testing and the methods by which the finished structure is to be measured for the purposes of the payment.

PSGA 3 MATERIAL

PSGA 3.2.1 Applicable Specifications

Add the following to G 3.2.1:

Portland cement that conforms to SABS 471

PSGA 3.2.2. Storage of Cement

Add the following to G 3.2.2:

Consignments of cement shall be used in the same sequence as that in which they are delivered on site. No cement shall be used which has been stored on site for a longer period than 6 (six) weeks. All cement so stored for a longer period than 6 (six) weeks, all cement damaged in any way, and all cement which does not comply with the specification, shall be removed immediately and permanently from the site.

PSGA 4. PLANT

PSGA4.4 Formwork

PSGA 4.3.3 Ties

Add the following to G 4.4.3:

No ties will be allowed in vertical walls and permanent metal ties shall have a minimum concrete cover of 40mm. Tie holes shall be filled with an approved non-shrink epoxy grout.

PSAGA 5CONSTRUCTION

PSGA 5.1 REINFORCEMENT

PSGA 5.1.3 Cover

Substitute G 5.1.3 with the following:

The cover of concrete over reinforcement, unless otherwise indicated on the drawings, shall be not less than 40mm.

Spacers and lifting blocks required for providing cover shall be formed of sand / cement mortar with a minimum cement: water ratio of 2,5, or shall be patent units manufactured from materials which will not corrode. The units shall be sufficiently strong for the purpose required and shall be provided with fixing devices suitable for maintaining the units in the required positions. The units shall be compatible with the type of finish required.

PSGA 5.2 FORMWORK

PSGA 5.2.1 Classification of Finishes

Add the following to G 5.2.1:

The following surface conditions are required in the various portions of the finished concrete:

(a) Rough

Concealed surfaces and surfaces lower than 100mm below finished ground level.

(b) Smooth

All surface finishes not classified as "rough" in paragraph (a) shall be classified as "smooth". All exposed edges otherwise indicated on the drawings, shall be chamfered 20 mm x 20 mm by means of triangular fillets fixed to the formwork.

PSGA 5.4 CONCRETE

The type of aggregates and cement, and their sources of supply, shall not be altered during the contract without the prior written agreement of, or instruction from, the *Engineer*.

Not less than two weeks before the start of any concrete work in the site, the *Contractor* shall submit a statement of mix designs providing the following information:

PSGA 5.4.1 Quality

PSGA 5.4.1.2 Consistency

Add the following to sub clause G 5.5.1.2:

The slump of concrete used in water retaining structures may not be less than 30mm and not more than 60mm.

PSGA 5.4.1.5 Strength of Concrete

Add the following to G 5.5.1.7:

The grade of strength of concrete and the maximum normal size of coarse aggregate for each portion of the works, unless otherwise indicated on the drawings, shall be as follows:

- | | |
|---|-------------|
| (a) Blinding layers and encasing of pipes | 20 MPa/19mm |
| (b) Benching | 20 MPa/19mm |
| (c) Screeds | 20 MPa/10mm |
| (d) Reinforced concrete | 30 MPa/19mm |

PSGA 5.4.1.7 Durability

Concrete shall be so proportioned to ensure that the water/cement ratio does not exceed 0,5 and, to ensure workability, water-reducing admixtures of approved manufacture shall be used in preference to increasing the cement content.

PSGA 5.4.7 Curing and Protection

The method of curing and protection shall be to the *Engineer's* approval.

PSGA 5.4.8 Concrete Surfaces

Add the following to GA 5.4.8.1:

Concrete surfaces under screeds, granolithic finishes or benching shall be brought up to a plane, uniform surface with a suitable screed board.

PSGA 5.4.9 Water tight concrete

Watertight concrete is to be constructed in accordance with the recommendations of BS 8007. The Contractor shall test all water-retaining structures for water-tightness in accordance with BS 8007. The *Contractor* shall submit proposed procedures for such tests to the *Engineer* for approval.

PSGA 5.4.10 Defects

After removal of the forms, if the concrete shows any defect or if subsequently any defect attributable to the quality of the concrete or its constituents should develop, the *Contractor* shall, at his own cost, on and in accordance with instruction from the *Engineer*, remove all defective concrete and replace it or make good such defects. No patching or making good shall be carried out by the *Contractor* without prior approval of the *Engineer*. See also General Contract Terms in relation to Defects.

The *Engineer's* approval of proposed patching techniques shall be obtained at the start of the *Contract* and all patching shall be done under strict supervision. Only work which is unsatisfactory in limited respects shall be allowed to be patched.

PSGA 5.4.11 Construction Joints

The use of construction joints must be minimized and may only be placed as shown on the drawings or at positions as approved by the *Engineer*.

At all construction joints in walls a PVC water stop without a center bulb must be placed as shown on the drawings.

Alternative materials with similar properties may be proposed but may only be installed after approval of the *Engineer*.

PSGA 5.5.10.4 Wood-floated finish

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

PSGA 5.5.10.5 Steel-floated finish

Where steel floating is specified or scheduled, the surface shall be treated as specified in PS G 5.5.10.4 except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface,

the screed surface shall be steel-troweled under the firm pressure to produce a dense, smooth, uniform surface free from trowel marks.

PSGA 8 Measurement and Payment

PSGA 8.1.1 Formwork

Formwork, other than formwork covered by 8.1.1.2 and 8.1.4, will be measured as the net area of the face of the concrete to be supported during the disposition of concrete. No deduction will be made for fillets and splays of size up to 50mm x 50mm or for openings of diameter up to 0,7 m or of area up to 0,5 m².

Formwork in continuous lengths of narrow widths and of filters or splays over 20 mm x 20 mm will be measured by length, the width or range of widths being stated in the schedule. Boxing-out, the forming of holes, and other such operations will be measured by number, basic dimensions, perimeters, or drawing references, as stated in the schedule.

The unit rate shall cover the cost of all parts of formwork in contact with the concrete, and the necessary bearers, struts, and other supports, plus the labour and plant necessary to erect and stick such formwork.

PSGA 8.1.2 Reinforcement

Steel for normal reinforced concrete will be measured net by mass of all bars, including supporting steel detailed on the reinforcing schedules. The mass will be computed from the nominal bar size and nominal mass per unit length. No allowance will be made for cutting, waste, spacer devices (material other than steel bars), or binding wire.

Steel reinforcement for precast concrete units will not be measured unless so scheduled (see 8.6).

Welded mesh will be measured by area as shown on the drawings, no allowance being made for cutting, waste, laps or deductions for end cover. The areas measured will be those of the concrete floor or slab being reinforced by means of mesh. In the case of continuous unit partly reinforced by mesh, the area will be computed from the outside dimensions of the area covered by mesh regardless of whether or not additional reinforcing shall be present in the same area.

Welding of reinforcement in any position in any structure is not permitted, unless approved in writing by the Engineer.

PSGA 8.1.3 Concrete

- a) Concrete will be measured net to the dimensions shown on the drawings or to the dimensions cast, whichever are the smaller. Structural elements that are undersized will be measured for payment only if they are accepted by the Engineer.
- b) No allowance will be made for concrete required to make up overbreak in soft excavation, but payment will be made for additional concrete or formwork, or both, ordered in writing by the Engineer to replace unsuitable material or overbreak in hard rock or in intermediate excavation (see (d) below).

The unit rates shall cover the cost of the provision of concrete (made with ordinary Portland cement unless otherwise scheduled), mixing, testing, placing, compacting, the forming of stop-ends and unforeseen construction joints, striking of for levelling as applicable, and curing and repairing where necessary, together with the cost of all parts of formwork in contact with the concrete and the necessary bearers, struts, and other supports, plus layout and plant necessary to erect and strike such formwork.

PROJECT SPECIFICATION

PORTION 2: VARIATIONS AND ADDITIONS TO STANDARDIZED SPECIFICATION

SABS 1200 VC: FENCING

PSVC 1 SCOPE

This specification covers the erection of a new 2.4m high fence with 1 x motor gate 2.4 x 2.4 m.

PSVC 4.2 SECURITY FENCING

Add this item to cover the erection of a new 2.4m high fence.

PSVC 4.2.1 Material

(a) Straining posts, standards and droppers

Straining posts, stays, standards and droppers shall be of the type and size indicated on the drawings. Steel sections shall comply with the requirements of CKS 82 and timber posts with the requirements of SABS 457. Timber posts shall be treated with a preservative in accordance with the requirement of sub clause 5402 (b)(i).

Droppers shall be 0.56kg ridge pack pattern droppers.

Tubular posts and stays shall be galvanized in accordance with SABS 763 for class B1 articles, or shall be painted as specified in section 8400 as may be required on the drawings, and shall have a wall thickness of at least 2.95mm. unless otherwise shown on the drawing, all tubular posts shall be provided with a 230mm x 230mm footplate and a pressed steel or cast-iron cap. Tubular stays shall have a nominal bore of at least 60mm.

Rolled steel section shall be provided with a protective coating of tar or other approved material.

(b) Bolts for strays

Bolts shall be galvanized steel bolts of the required length and a diameter which shall not be less than 12mm. All the necessary bolts, nuts and washers, shall be supplied with each post.

B5507 Erecting Fence Wire

All the fence wire shall be tied to the sides of standards or posts to prevent the wires from being displaced or becoming loose. The wire shall be carefully tensioned without sagging and true to line, care being exercised not to tension the wire to such an extent that it will break, or that end, corner, straining or gate posts will be pulled out or that it will be easily damaged during veld fires.

Each strand of fencing wire shall be securely tied in the correct position hard/up to each standard with soft galvanized tying wire. The tying wire for each strand shall pass through a hole or notch in the standard, while the ends of the tying wire shall be wound at least four times around the fencing wire to prevent it from moving in a vertical direction.

B 5513 GENERAL REQUIREMENTS

The completed fence shall be plumb, taut, true to line and ground contour, with all posts, standards and stays firmly set. The height of the lower fencing wire about the ground at posts and standards shall not deviate by more than 25mm from that shown on the drawings. Other fencing wires shall not deviate by more than 10mm from their prescribed vertical positions.

B 5514 MEASUREMENT AND PAYMENT

Item Unit

55.01 Cleaning the fence line 2m wide strip m(m)

The removal of trees and stumps with a girth exceeding 1m shall be paid as specified in section 1700.

B 55.02 Supply and erect new fencing material for new fence and for supplementing material in existing fences which are being repaired or removed:

- (a) Zinc-coating barbed wire 3 mild steel grade, double stand 2.5mm diameter unidirectional twist (SABS 675)
- (b) Zinc-coating smooth wire 2.24mm diameter, high tensible fencing wire (SABS 675)

The unit of measurement shall be erected as specified in the drawings completely drilled with steel cap and base plate and painted. The price shall also include full compensation for the excavation of 300mm x 300mm x 800mm deep holes and the backfill with concrete.

Gate

Single motor gate (2.4 x 2.4 mm) Unit (No.)

The unit of measurement shall be the number of gates erected. The two wings of the double gates shall be considered as one gate. The tendered rate shall include full compensation for the procurement and supply of all material including gates, gate posts, hinges, bolts, mesh, binding wire, concrete, etc., as well as the erection of the gates as specified and indicated in the drawings.

PROJECT SPECIFICATIONS PORTION 2:

VARIATIONS AND ADDITIONS TO

STANDARDIZED SPECIFICATIONS

SABS 1200 H: STRUCTURAL STEELWORK

PSH1 SCOPE

This specification covers the execution of work entailed in structural steelwork generally for buildings and other structures. It covers the basic materials, the quality, manufacture, tolerances in workmanship, testing and the methods by which the finished structure is to be measured for the purposes of the payment.

PSH 3 MATERIAL

PSH 3. 6 Bolts, nuts and washers

All site connections are to be bolted unless otherwise specified. The *Contractor* is to supply all bolts including chemical anchors used as holding down bolts. Site bolts are to be suitably bagged and labelled. Bolt grades are to be as follows, unless specifically noted on the drawings:

Structural Connections : Grade 8.8 M20 with 22 mm diameter holes

Hand railing, Stair Tread Connections : Grade 4.8 M16 with 18 mm diameter holes

HSFG Connections : Grade 8.8S M24 tightened by the “turn-of-the-nut method”.

PSH 5 CONSTRUCTION

PSH 5. 1 Drawings and shop details

PSH 5. 1. 1 Design drawings

The *Engineer's* drawings will include a general arrangement of the proposed structure indicating all structural member sizes and special connections. For standard types of connections, specific design loadings will be indicated and shall be sufficiently comprehensive to allow the detailing of these connections. If no specific loadings are supplied, it should be assumed that:

- For cross-bracing members, the connection shall be designed to carry the full tension capacity of the member, unless otherwise noted.
- For compression bracing members, the connection shall be designed to carry the compression capacity of the member taking cognisance of the effective length of the member, unless otherwise noted.

To assist the Fabrication *Contractor* in the preparation of shop fabrication details, the *Engineer* can provide an electronic copy of the drawings in AutoCAD 2007 format. Electronic drawings are issued in good faith, and it is the responsibility of the *Contractor* to ensure they are not in conflict with the issued hard copy drawings (which take preference). No claims in this respect will be entertained.

PSH 5. 1. 2 Contractor provides shop details

The *Contractor* is responsible for producing all shop drawings for the project.

Connections shall be designed per the following:

- No eccentricities in connections are permitted unless shown on the *Engineer's* drawings, or as requested by the *Contractor* and approved by the *Engineer* in writing. Should approval be given for eccentric connections, the *Contractor* is to design these connections to resist the secondary effects of these eccentricities.
- For angle connections, bolts are to be placed on the standard back mark position, which is to correspond with the centreline shown on the *Engineer's* drawing.
- The *Contractor* must ensure that suitably qualified and experienced technical staff are employed to undertake the design and draughting of connections.
- The *Contractor* shall ensure that details that are likely to initiate corrosion are avoided.

The *Contractor* shall, at his own expense, prepare and submit one copy of shop drawings of all fabricated work, working or setting out drawings, shop details and schedules to the *Engineer* for review by the *Engineer*, and fabrication of such work shall not be performed by the *Contractor* until such acceptance has been confirmed.

Unless otherwise agreed with the *Engineer*, shop drawings shall be complete in every respect, prepared to show all details of fabrication and erection of all components and assemblies. All shop drawings must be submitted with issue slips, clearly stating the drawing number and revision of each shop drawing.

The *Engineer* will generally only review member sizes regarding the general arrangement and correct implementation of the design on the detail drawings. Responsibility for design and dimensional accuracy of connections not fully detailed on the *Engineer's* drawings remains the responsibility of the *Contractor*. Acceptance by the *Engineer* relates to conceptual adequacy, and does not absolve the *Contractor* of his obligations and responsibilities in this regard. The *Engineer* will retain a copy of the drawing and it will be returned to the *Contractor* within 7 working days with the *Engineer's* comments or acceptance. Shop details must be accepted in writing by the *Engineer* prior to the commencement of fabrication.

PSH 5. 4 Setting out

Concrete work to support the steelwork shall be constructed by the main structure *Contractor*. The structural steel *Contractor* shall, before commencing erection check all holding down bolts for deviation from line and level and report in writing to the *Engineer* any deviations which fall outside the tolerances specified. Commencement of erection shall infer acceptance of the holding down bolts and concrete work as constructed or remedied.

The *Contractor* shall agree with the main structure *Contractor* the proposed method of fixing the holding down bolts.

PSH 5. 5 Erection

PSH 5. 5. 1 Procedure

The *Contractor* shall submit for the *Engineer's* review a method statement describing the proposed erection procedure.

PSH 5. 6 Grouting of supports

PSH 5. 6. 2 Bedding- of Stanchions in Foundation Pockets.

Chemical anchor bolts for fixing steelwork to concrete elements shall be installed in accordance with the manufacturer's recommendations for hole diameter, depth of embedment and tightening torque.

PSH 6 TOLERANCES

PSH 6.1 General

PSH 6.1.1 Verification of dimensions

Where modifications or extensions are made to existing structures, all relevant dimensions are to be checked on site before commencing fabrication drawings or fabrication.

PSH 7 TESTING

PSH 7.1 Test certificates

The *Contractor* shall supply manufacturer's test certificates pertaining to the steel to be used to the *Engineer* on a regular basis.

PSH 7.3 Inspection and testing of welds

Additional Sub clause

Non-destructive testing of welds is required to be performed per AWS D1.1 by suitably qualified and competent personnel. All test procedures techniques and acceptance criteria are to be as specified in ASW D1.1. The following are specifically required by the *Engineer* as a minimum:

Visual Inspection	:	All welds
Dye Penetrant Tests	:	10% of all welds
Magnetic Particle Tests	:	10% of all base plate welds
UT or X-Ray Tests by the <i>Engineer</i>	:	10% of the length of all butt welds and all site welds if permitted

Welds not satisfying the acceptance criteria are to be repaired accordingly at the *Contractor's* account.

PROJECT SPECIFICATIONS PORTION 2:

VARIATIONS AND ADDITIONS TO

STANDARDIZED SPECIFICATIONS

SABS 1200 HC: CORROSION PROTECTION OF STRUCTURAL STEELWORK

PSHC1 SCOPE

This specification covers the execution of work entailed in the corrosion protection of structural steel. It covers the basic materials, the quality, manufacture, tolerances in workmanship, testing and the methods by which the finished structure is to be measured for the purposes of the payment.

PSHC 3 MATERIAL

PSHC 3. 1 Packaging

Where a manufacturer's product is specified, generic alternatives shall not be used without the *Engineer's* prior written approval.

PSHC 5 CONSTRUCTION (EXECUTION OF WORK)

PSHC 5. 4 Preparation for Coating

PSHC 5. 4. 1 General

Preparation of the steelwork and application of the coating system shall take place at an approved location.

PSHC 5. 4. 2 Removal of Contaminants

After fabrication, but prior to any form of preparation, all steelwork shall be washed down and cleaned to remove grease and other contaminants.

PSHC 5. 4. 3 Methods of Preparation

PSHC 5. 4. 3. 1 Abrasive Blast Cleaning

The required standard of blast cleaning, measured in terms of Swedish Standard SIS 05 59 00, is specified with the coating system.

PSHC 5. 6 Cleaning of Surfaces about to be Coated

Within four hours of preparation, the substrate shall be cleaned of all dust and the first coat of the coating system shall be applied.

PSHC 5.7 Coating Systems

Tables of Coatings:

PREPARATION OF STEELWORK	METHOD : SABS 064 STANDARD : ISO 8501-1:1998 - Sa 2½	
COAT	PAINT TYPE	DFT
Primer	Inorganic Zinc Silicate with minimum 85% zinc in the dry film	75-100 µm
Intermediate	Recoat able MIO Epoxy	75-150 µm
Finish	Water borne Acrylic	40-70 µm

All coating systems are to be applied in strict accordance with the manufacturer's instructions. Equivalent products from other manufacturers of the same generic types may be used with written approval of the *Engineer*.

PSHC 5.8 Application of Paint Coatings

After erection, repair any damage and apply the finishing coats specified in the coating system.

The method of coating application shall be strictly in accordance with the manufacturer's recommendations.

There shall be a colour contrast between successive coats.

All bolts, nuts and washers shall be primed and painted as specified for the steelwork.

No painting on site shall be carried out in inclement weather or when humidity or frost is liable to cause wet or damp conditions on the surfaces to be painted.

PSHC 5.9 Application of Metal Coatings

Hot dip galvanising shall comply with the requirements of SABS 763.

All bolts, nuts and washers shall be hot dip galvanised.

Flame cutting and welding of galvanised members will not be permitted.

Holes may be drilled through galvanised members only with the *Engineer's* written approval in each case, and the exposed steel shall be made good as specified in Sub clause PSHC.2.6.2.

PSHC 5. 10 Repair of Damaged Coatings

All items of steelwork shall be examined on site, before and after erection, for damage to coatings.

Damaged areas shall be repaired in accordance with Clause 5.10.

Where approved site cutting or welding are required, the area for a distance of about 50 mm on either side of the cut shall be cleaned of all coatings, the cutting or welding carried out, the weld de-slugged, all flux and weld spatter removed, the steelwork ground down to "white metal" and coated as specified above.

PROJECT SPECIFICATIONS PORTION 2:
VARIATIONS AND ADDITIONS TO
STANDARDIZED SPECIFICATIONS
SABS 1200 L: MEDIUM-PRESSURE PIPELINES

PSL1 SCOPE

This specification covers the supply and installation of pipelines of diameter up to 1 000 mm, Complete with ancillary works, for transporting water and sewage under working pressures of up to 2.5 MPa. It covers the basic materials, the quality, manufacture, tolerances in workmanship, testing and the methods by which the finished structure is to be measured for the purposes of the payment.

PSL 3 MATERIAL

PSL 3.1 General

Where a manufacturer's product is specified, generic alternatives shall not be used without the *Engineer's* prior written approval.

Buried Fittings shall be of an approved type with joints and pressure class ratings compatible with the pipe used.

All materials of construction will be new, free from all defects and imperfections such cracks, tears or porosity, and shall be suitable for the intended application

Pipes shall not be used for grounding of electrical services.

All components supplied shall be adequately protected against rust and corrosion during storage, and operational life of the equipment in their planned environment/s.

No unit will be considered complete until accepted by Engineer.

The Engineer must have access, at all reasonable times, to those parts of the manufacturing facilities engaged in the manufacture of items in terms of this specification. He is authorized to witness any stage of manufacture, tests and inspect documentation.

The Engineer is authorised to reject any items not manufactured to the requirements of the agreed standards and this specification.

All equipment must be inspected at the Supplier's works prior to delivery, to ensure compliance with the specification.

Machined surfaces, nuts, bolts, washers and screw threads must be protected with suitable corrosion inhibitors.

PSL 5 CONSTRUCTION

PSL 5.1 Laying

PSL 5.1.1 General

Unless approved, pipe work shall not be run under structures and when pipe must be run under structures, special precautions shall be taken, including the following:

PSL 5.1.2 Damage

Pipes, valves, hydrants, and fittings shall be inspected for damage when received and shall be inspected prior to installation.

All pipe, fittings and valves shall be carefully lowered into the trench using appropriate equipment and carefully examined for cracks or other defects while suspended above the trench.

Plain ends shall be inspected for signs of damage prior to installation.

Under no circumstances shall water main materials be dropped or dumped.

PSL 5.2 Jointing Methods

When it is necessary to join metal pipe with pipe of dissimilar metal, the joint shall be insulated against the passage of an electric current using an approved method.

PSL 5.10 Disinfection of portable water pipelines

Underground piping, from the water supply to the system riser, and lead-in connections to system riser shall be completely flushed before connection is made to downstream system piping.

The flushing operation shall be continued for a sufficient time to ensure thorough cleaning.

PSL 7 TESTING

PSL 7.1 General

Vendors and Sub-contractors will submit test reports, certification for materials of construction and the results of the appropriate Non-Destructive Testing (NDT) and collate these documents into the Quality Control Dossier.

All piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 3.5 bar more than the system working pressure, and shall maintain that pressure without loss for 2 hours.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.1 General

Payment for pipe laying shall include for the supply, delivery, laying and jointing of pipes together with the trimming or cutting of pipes at junction structures and for all plant, equipment and labour necessary for these operations.

PROJECT SPECIFICATIONS PORTION 2:

VARIATIONS AND ADDITIONS

TO STANDARDIZED SPECIFICATIONS

SABS 1200 LB: BEDDING PIPES

PSLB1 SCOPE

This specification covers the bedding (bedding cradle and selected fill blanket) for buried pipes carrying fluids under pressure or gravity. It covers the basic materials, the quality, manufacture, tolerances in workmanship, testing and the methods by which the finished structure is to be measured for the purposes of the payment.

PSLB 3 MATERIAL

PSLB 3. 1 Selected granular material

Selected Granular Materials (sub clause 3.1)

Delete the word "singularly"

PSLB 3. 3 Bedding

uPVC pipelines shall be regarded as flexible and the class of bedding to be used shall be as shown on the drawings. All other pipes shall be regarded as rigid and a Class B bedding shall be used.

PSLB 3. 4 Selection

Suitable selected bedding material will occasionally be available from trench excavations along the route.

PSLB 5 CONSTRUCTION

PSLB 5. 1 Trench

PSLB 5. 1. 4 Compacting

The use of mechanical compaction equipment will not be permitted within 300mm above the crown of the pipe.

PSLB 6 TOLERANCES

PSLB 6. 1 Moisture Content and Density

The degree of accuracy shall be II.

C5. OHS Specifications for Construction Projects

5.1. Specifications

1. PREAMBLE

In terms of Construction Regulation 4(1)(a) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), the Department of Public Works, as the Client and/or its Agent on its behalf, shall be responsible to prepare Health & Safety Specifications for any intended construction project and provide any Principal Contractor who is making a bid or appointed to perform construction work for the Client and/or its Agent on its behalf with the same.

The Client's further duties are as described in The Act and the Regulations made there-under. The Principal Contractor shall be responsible for the Health & Safety Policy for the site in terms of Section 7 of the Act and in line with Construction Regulation 5 as well as the Health and Safety Plan for the project.

This 'Health and Safety Specifications' document is governed by the "Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), hereinafter referred to as 'The Act'. Notwithstanding this, cognisance should be taken of the fact that no single Act or its set of Regulations can be read in isolation. Furthermore, although the definition of Health and Safety Specifications stipulates 'a documented specification of all health and safety requirements pertaining to associated works on a construction site, so as to ensure the health and safety of persons', it is required that the entire scope of the Labour legislation, including the Basic Conditions of Employment Act be considered as part of the legal compliance system. With reference to this specification document this requirement is limited to all health, safety and environmental issues pertaining to the site of the project as referred to here-in. Despite the foregoing it is reiterated that environmental management shall receive due attention.

Due to the wide scope and definition of construction work, every construction activity and site will be different, and circumstances and conditions may change even on a daily basis. Therefore, due caution is to be taken by the Principal Contractor when drafting the Health and Safety Plan based on these Health and Safety Specifications. Prior to drafting the Health and Safety Plan, and in consideration of the information contained here-in, the contractor shall set up a Risk Assessment Program to identify and determine the scope and details of any risk associated with any hazard at the construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard. *This Risk Assessment and the steps identified will be the basis or point of departure for the Health and Safety Plan.* The Health and Safety Plan shall include documented 'Methods of Statement' (see definitions under Construction Regulations) detailing the key activities to be performed in order to reduce as far as practicable, the hazards identified in the Risk Assessment.

2. SCOPE OF HEALTH AND SAFETY SPECIFICATION DOCUMENT

The Health and Safety Specifications pertaining to the project; "(name of the project) – Phase 1 and Phase 2" etc. etc. – see *paragraph 8 on page 13*), cover the subjects contained in the index and is intended to outline the normal as well as any special requirements of the Department pertaining to the health and safety matters (including the environment) applicable to the project in question. These Specifications should be read in conjunction with the Act, the Construction Regulations and all other Regulations and Safety Standards which were or will be promulgated under the Act or incorporated into the Act and be in force or come into force during the effective duration of the project. The stipulations in this specification, as well as those contained in all other documentation pertaining to the project, including contract

documentation and technical specifications shall not be interpreted, in any way whatsoever, to countermand or nullify any stipulation of the Act, Regulations and Safety Standards which are promulgated under, or incorporated into the Act.

3. PURPOSE

The Department is obligated to implement measures to ensure the health and safety of all people and properties affected under its custodianship or contractual commitments, and is further obligated to monitor that these measures are structured and applied according to the requirements of these Health and Safety Specifications.

The purpose of this specification document is to provide the relevant Principal Contractor (and his /her contractor) with any information other than the standard conditions pertaining to construction sites which might affect the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; and to protect persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work during the carrying out of construction work for the Department of Public Works. The Principal Contractor (and his /her contractor) is to be briefed on the significant health and safety aspects of the project and to be provided with information and requirements on inter alia:

- a) safety considerations affecting the site of the project and its environment;
- b) health and safety aspects of the associated structures and equipment;
- c) submissions on health and safety matters required from the Principal Contractor (and his /her contractor); and
- d) the Principal Contractor's (and his /her contractor) health & safety plan.

To serve to ensure that the Principal Contractor (and his /her contractor) is fully aware of what is expected from him/her with regard to the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Regulations made there-under including the applicable safety standards, and in particular in terms of Section 8 of the Act.

To inform the Principal Contractor that the Occupational Health and Safety Act, 1993 (Act 85 of 1993) in its entirety shall apply to the contract to which this specification document applies. The Construction Regulations promulgated on 18 July 2003 and incorporated into the above Act by Government Notice R 1010, published in Government Gazette 25207 shall apply to any person involved in construction work pertaining to this project, as will the Act.

4. DEFINITIONS

"Purpose of the Act" –

To provide for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

"Agent" –

means any person who acts as a representative for a client;

"Client" –

means any person for whom construction work is performed;

"Construction Work" is defined as any work in connection with –

- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
- (b) the installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling;
- (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
- (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;

“Contractor” –

means an employer, as defined in Section 1 of the Act, who performs construction work and includes Principal Contractors;

“Health and Safety File” –

means a file, or other record in permanent form, containing the information required a contemplated in the regulations;

“Health and Safety Plan” –

means a documented plan which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified;

“Health and Safety Specification” –

means a documented specification of all health and safety requirements pertaining to the associated works on a construction site, so as to ensure the health and safety of persons;

“Method Statement” –

means a document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment;

“Principal Contractor” –

means an employer, as defined in section 1 of the Act who performs construction work and is appointed by the client to be in overall control and management of a part of or the whole of a construction site;

“Risk Assessment” –

means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard.

5. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

5.1 Structure and Organization of OH&S Responsibilities

5.1.1. Overall Supervision and Responsibility for OH&S

- * The Client and/or its Agent on its behalf to ensure that the Principal Contractor, appointed in terms of Construction Regulation 4(1)(c), implements and maintains the agreed and approved H&S Plan. Failure on the part of the Client or Agent to comply with this requirement will not relieve the Principal Contractor from any one or more of his/her duties under the Act and Regulations.
- * The Chief Executive Officer of the Principal Contractor in terms of Section 16 (1) of the Act to ensure that the Employer (as defined in the Act) complies with the Act. The pro forma Legal Compliance Audit may be used for this purpose by the Principal Contractor or his/her appointed contractor.
- * All OH&S Act (85 /1993), Section 16 (2) appointee/s as detailed in his/her/their respective appointment forms to regularly, in writing, report to their principals on matters of health and safety per routine and ad hoc inspections and on any deviations as soon as observed, regardless of whether the observation was made during any routine or ad hoc inspection and to ensure that the reports are made available to the principal Contractor to become part of site records (Health & Safety File).
- * The Construction Supervisor and Assistant Construction Supervisor/s appointed in terms of Construction Regulation 6 to regularly, in writing, report to their principals on matters of health and safety per routine and ad hoc inspections and on any deviations as soon as observed, regardless of whether the observation was made during any routine or ad hoc inspection and to ensure that the reports are made available to the principal Contractor to become part of site records (Health & Safety File).
- * All Health and Safety Representatives (SHE-Reps) shall act and report as per Section 18 of the Act.

5.1.2. Legal Appointments

Several appointments or designations of responsible and /or competent people in specific areas of construction work are required by the Act and Regulations. The following competent appointments, where applicable, in terms of the Construction Regulations are required to ensure compliance to the Act, Regulations and Safety Standards.

Required appointments as per the Construction Regulations:-

Item	Regulation	Appointment	Responsible Person
1.	4(1)(c)	Principal contractor for each phase or project	Client
2.	5.(3)(b)	Contractor	Principal Contractor
3.	5(11)	Contractor	Contractor
4.	6(1)	Construction supervisor	Contractor
5.	6(2)	Construction supervisor sub-ordinates	Contractor
6.	6(6)	Construction Safety Officer	Contractor
7.	7(1)	Person to carry out risk assessment	Contractor
8.	7(4)	Trainer/Instructor	Contractor
9.	8(1)(a)	Fall protection planner	Contractor
10.	10 (a)	Formwork & support work supervisor	Contractor
11.	10(e) + (f)	Formwork & support work examiner	Contractor
12.	11(1)	Excavation supervisor	Contractor
13.	11(3)(b)(ii)(b)	Professional engineer or technologist	Contractor
14.	11(3)(k)	Explosives expert	Contractor

15.	12(1)	Supervisor demolition work	Contractor
16.	12(2) + (3)	Demolition expert	Contractor
17.	12(11)	Explosives expert	Contractor
18.	14(2)	Scaffold supervisor	Contractor
19.	15(1)	Suspended platform supervisor	Contractor
20.	15(2)(c)	Compliance plan developer	Contractor
21.	15(8)(c)	Suspended platform expert	Contractor
22.	15(13)	Outrigger expert	Contractor
23.	17(8)(a)	Material hoist inspector	Contractor
24.	18(1)	Batch plant supervisor	Contractor
25.	18(7)	Batch plant operator	Contractor
26.	19(2)(b)	Power tool expert	Contractor
27.	19.2 (g) (i)	Power tool controller	Contractor
28.	20(f)	Tower crane operator	Contractor
29.	21(1)(d)(i)	Construction vehicle and mobile plant operator	Contractor
30.	21(1)(j)	Construction vehicle and mobile plant inspector	Contractor
31.	22(d)	Temporary electrical installations inspector	Contractor
32.	22 (e)	Temporary electrical installations controller	Contractor
33.	26 (a)	Stacking and storage supervisor	Contractor
34.	27 (h)	Fire equipment inspector	Contractor

This list may be used as a reference or tool to determine which components of the Act and Regulations would be applicable to a particular site, as was intended under paragraph 3 & 4 of the Chapter "Preamble" (page 4) above. This list must not be assumed to be exclusive or comprehensive.

5.2 **Communication & Liaison**

- 5.2.1 OH&S Liaison between the Employer, the Principal Contractor, the other Contractors, the Designer and other concerned parties shall be through the Project Committee as per the procedures determined by the Project Committee.
- 5.2.2 In addition to the above, communication may be directly to the Client or his appointed Agent, verbally or in writing, as and when the need arises.
- 5.2.3 Consultation with the workforce on OH&S matters will be through their Supervisors and H&S Representatives ('SHE – Reps')
- 5.2.4 The Principal Contractor will be responsible for the dissemination of all relevant OH&S information to the other Contractors e.g. design changes agreed with the Client and/or its Agent on its behalf and the Designer, instructions by the Client and/or his/her agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations etc.

6. **RESPONSIBILITIES**

6.1 **Client**

- 6.1.1 The Client or his appointed Agent on his behalf will appoint each Principal Contractor for this project or phase/section of the project in writing for assuming the role of Principal Contractor as intended by the Construction Regulations and determined by the Bills of Quantities.
- 6.1.2 The Client or his appointed Agent on his behalf shall discuss and negotiate with the Principal Contractor the contents of the health and safety plan of the both Principal Contractor and Contractor for approval.

- 6.1.3 The Client or his appointed Agent on his behalf, will take reasonable steps to ensure that the health and safety plan of both the Principal Contractor and Contractor is implemented and maintained. The steps taken will include periodic audits at intervals of at least once every month.
- 6.1.4 The Client or his appointed Agent on his behalf, will prevent the Principal Contractor and/or the Contractor from commencing or continuing with construction work should the Principal Contractor and/or the Contractor at any stage in the execution of the works be found to:
- have failed to have complied with any of the administrative measures required by the Construction Regulations in preparation for the construction project or any physical preparations necessary in terms of the Act;
 - have failed to implement or maintain their health and safety plan;
 - have executed construction work which is not in accordance with their health and safety plan; or
 - act in any way which may pose a threat to the health and safety of any person(s) present on the site of the works or in its vicinity, irrespective of him/them being employed or legitimately on the site of the works or in its vicinity.

6.2 **Principal Contractor**

- 6.2.1 The Principal Contractor shall accept the appointment under the terms and Conditions of Contract. The Principal Contractor shall sign and agree to those terms and conditions and shall, before commencing work, notify the Department of Labour of the intended construction work in terms of Regulation 3 of the Construction Regulations. Annexure B of this Specification contains a "Notification of Construction Work" form. The Principal Contractor shall submit the notification in writing prior to commencement of work and inform the Client or his Agent accordingly.
- 6.2.2 The Principal Contractor shall ensure that he is fully conversant with the requirements of this Specification and all relevant health and safety legislation. This Specification is not intended to supersede the Act nor the Construction Regulations or any part of either. Those sections of the Act and the Construction Regulations which apply to the scope of work to be performed by the Principal Contractor in terms of this contract (entirely or in part) will continue to be legally required of the Principal Contractor to comply with. The Principal Contractor will in no manner or means be absolved from the responsibility to comply with all applicable sections of the Act, the Construction Regulations or any Regulations proclaimed under the Act or which may perceivable be applicable to this contract.
- 6.2.3 The Principal Contractor shall provide and demonstrate to the Client a suitable and sufficiently documented health and safety plan based on this Specification, the Act and the Construction Regulations, which shall be applied from the date of commencement of and for the duration of execution of the works. This plan shall, as appendices, include the health and safety plans of all Sub-contractors for which he has to take responsibility in terms of this contract.
- 6.2.4 The Principal Contractor shall provide proof of his registration and good standing with the Compensation Fund or with a licensed compensation insurer prior to commencement with the works.
- 6.2.5 The Potential Principal Contractor shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and Construction Regulations. (Note: This shall have to be contained in the conditions of tender upon which a tenderer's offer is based.)
- 6.2.6 The Principal Contractor shall consistently demonstrate his competence and the adequacy of his resources to perform the duties imposed on the Principal Contractor in terms of this Specification, the Act and the Construction Regulations.
- 6.2.7 The Principal Contractor shall ensure that a copy of his health and safety plan is available on site and is presented upon request to the Client, an Inspector, Employee or Sub-contractor.

- 6.2.8 The Principal Contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of this Specification, the Act and the Construction Regulations, is opened and kept on site and made available to the Client or Inspector upon request. Upon completion of the works, the Principal Contractor shall hand over a consolidated health and safety file to the Client.
- 6.2.9 The Principal Contractor shall, throughout execution of the contract, ensure that all conditions imposed on his Sub-contractors in terms of the Act and the Construction Regulations are complied with as if they were the Principal Contractor.
- 6.2.10 The Principal Contractor shall from time to time evaluate the relevance of the Health and Safety Plan and revise the same as required, following which revised plan shall be submitted to the Client and/or his/her Agent for approval.

7. SCOPE OF WORK

These specifications are applicable to the specific scope of work pertaining to the project as detailed in the tender documents. **Refer to Project Specification.**

8. HEALTH AND SAFETY FILE

The Principal Contractor must, in terms of Construction Regulation 5(7), keep a Health & Safety File on site at all times that must include all documentation required in terms of the Act and Regulations and must also include a list of all Contractors on site that are accountable to the Principal Contractor and the agreements between the parties and details of work being done.

The Health and Safety File will remain the property of the Client and/or its Agent on its behalf throughout the period of the project and shall be consolidated and handed over to the Client and/or its Agent on its behalf at the time of completion of the project.

The safety file shall contain the following documentation:

- safety records
- notification documents
- appointment letters
- records of incidents
- records of safety meetings
- records of PPE provision
- and any other documented related to safety issues on site.

9. MONITORING AND REVIEWING OH&S PERFORMANCE

The Principal Contractor is required to maintain an acceptable incident rate and report on this to the Client and/or its Agent on its behalf on a monthly basis. The frequency rates must reflect permanent disability, lost workdays, restricted workdays, medical treatment and first aid treatment.

10. HAZARDS AND DEVELOPMENT OF RISK ASSESSMENTS

The Principal Contractor is required to develop Risk Assessments, Standard Working Procedures (SWP) and Method Statements for each activity executed in the contract or project. This identification of hazards is over and above the hazards identification programme and those hazards identified during the drafting of the Health and Safety Plan. Hazard identification should be conducted continuously over and above the baseline risk assessment.

11. ARRANGEMENTS FOR MONITORING AND REVIEW

11.1 Monthly Audit by Client

The Client and/or its Agent on its behalf will be conducting Periodic Audits at times agreed with the Principal Contractor Audit to comply with Construction Regulation 4(1)(d) to ensure that the principal Contractor has implemented, is adhering to and is maintaining the agreed and approved OH&S Plan.

11.2 Other audits and inspections by client and/or its agent on its behalf.

The Client and/or its Agent on its behalf reserves the right to conduct any other ad hoc audits and inspections as it and/or its Agent on its behalf deem necessary.

A representative of the Principal Contractor and the relevant Health and Safety Representative(s) (SHE-Reps) must accompany the Client and/or its Agent on its behalf on all Audits and Inspections and may conduct their own audit/inspection at the same time. Each party will, however, take responsibility for the results of his/her own audit/inspection results. The Client and/or its Agent on its behalf may require to be handed a copy of the minutes of the previous Health and Safety Committee meeting reflecting possible recommendations made by that committee to the Employer for reference purposes and any other related issues.

12.3 Reports

11.3.1 The Principal Contractor shall report all incidents where an employee is injured on duty to the extent that he/she dies, becomes unconscious, loses a limb or part of a limb, is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed or where a major incident occurred, the health or safety of any person was endangered, where a dangerous substance was spilled, the uncontrolled release of any substance under pressure took place, machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects, machinery ran out of control, to the Provincial Director of the Department of Labour within seven days and at the same time to the Client and/or its Agent on its behalf.

11.3.2 The Principal Contractor is required to provide the Client and/or its Agent on its behalf with copies of all statutory reports required in terms of the Act and the Regulations.

11.3.3 The Principal Contractor is required to provide the Client and/or its Agent on its behalf with a monthly "SHE Risk Management Report".

11.3.4 The Principal Contractor is required to provide a.s.a.p. the Client and/or its Agent on its behalf with copies of all internal and external accident/incident investigation reports. As soon as the occurrence of any accident/incident of whatever nature comes to the notice of the Principal Contractor, it shall be reported immediately to any of the following:

* the Occupational Health and Safety Section of the Pretoria Regional Office of the Dept. of Public Works.

11.4 Review

The Principal Contractor is to review the Hazard Identification, Risk Assessments and Standard Work Processes at each Production Planning and Progress Report meeting as the construction work develops and progresses and each time changes are made to the designs, plans and construction methods and processes. The Principal Contractor must provide the Client and/or its Agent on its behalf, other Contractors and all other concerned parties with copies of any changes, alterations or amendments.

11.5 Site Rules and other Restrictions

11.5.1 Site OH&S Rules

The Principal Contractor must develop a set of site-specific OH&S rules that will be applied to regulate the Health and Safety Plan and associated aspects of the construction. When required for a site by law, visitors and non-employees upon entering the site shall be issued with the proper Personal Protective Equipment (PPE) as and when necessary.

11.5.2 Security Arrangements

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must include the rule that non-employees shall at all times be provided with fulltime supervision while on site. The Principal Contractor must develop a set of Security rules and procedures and maintain these throughout the construction period.

If not already tasked to the H&S Officer appointed in terms of Construction Regulation 6(6), the Principal Contractor must appoint a competent Emergency Controller who must develop contingency plans for any emergency that may arise on site as indicated by the risk assessments. These must include a monthly practice/testing programme for the plans e.g. January: trench collapse, February: flooding etc. and practiced/tested with all persons on site at the time, participating.

11.6 Training

The Principal Contractor shall ensure that all employees under his or her control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment.

The Principal Contractor shall ensure that all labourers are informed regarding any hazard as stipulated in the risk assessment before any work commences, and thereafter at such times as may be determined in the risk assessment.

The Principal Contractor shall ensure that as far as is reasonably practicable, ergonomic are analysed, evaluated and addressed in the risk assessment.

No Principal Contractor shall allow or permit any employee to enter any site, unless such person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

The Principal Contractor shall ensure that all visitors to a construction site undergoes health and safety instruction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal and protective equipment: Provided that where visits are made only to the site office which is not in direct contact with the construction work activities, those health and safety instructions and the provision of personal protective equipment may not apply.

The contents and syllabi of all training required by the Act and Regulations including any other related or relevant training as required must be included in the Principal Contractor's Health and Safety Plan and Health and Safety File.

11.6.1 General Induction Training

The Principal Contractor must ensure that the employees on site are conversant with the general health and safety requirements on site. All employees of the Principal and other Contractors must be in possession of proof of General Induction training

11.6.2 Site Specific Induction Training

All employees of the Principal and other Contractors must be in possession of Site Specific Occupational Health and Safety Induction or other qualifying training

11.6.3 Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment must be in possession of valid proof of training. All employees in jobs requiring training in terms of the Act and Regulations must be in possession of valid proof of training as follows:

- General Induction (Section 8 of the Act)
- Site/Job Specific Induction (also visitors) (Sections 8 & 9 of the Act)
- Site/Project Manager
- Construction Supervisor
- OH&S Representatives (Section 18 (3) of the Act)
- Training of the Appointees indicated in 12.6.1 & 12.6.2 above
- Operation of Cranes (Driven Machinery Regulations 18 (11))
- Operators & Drivers of Construction Vehicles & Mobile Plant (Construction Regulation 21)
- Basic Fire Prevention & Protection (Environmental Regulations 9 and Construction Regulation 27)
- As a minimum basic First Aid to be upgraded when necessary (General Safety Regulations 3)
- Storekeeping Methods & Safe Stacking (Construction Regulation 26)
- Emergency, Security and Fire Co-ordinator

11.7 Accident and Incident Investigation

The Principal Contractor is responsible to oversee the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to receive first aid or be referred for medical treatment by a doctor, hospital or clinic. (General Administrative Regulation 9).

The Principal Contractor is responsible for the investigation of all non-injury incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar incidents in future. Notwithstanding the requirements of Section 24 of the Act, ALL incidents shall be investigated and reported on in writing, irrespective of whether such incident gave rise to injury or damage.

11.8 H&S Representatives and H&S Committees

11.8.1 Designation of H&S Representatives

Where the Principal Contractor employs more than 20 persons (including the employees of other Contractors (sub-contractors) he has to appoint one H&S Representative for every 50 employees or part thereof. (Section 17 of the Act and General Administrative Regulation 6. & 7.). H&S Representatives have to be designated in writing and the designation shall be in accordance with the Collective Agreement as concluded between the parties as is required in terms of General Administration Regulation 6.

11.8.2 Duties and Functions of the H&S Representatives

The Principal Contractor must ensure that the designated H&S Representatives conduct at least a weekly inspection of their respective areas of responsibility using a checklist and report thereon to the Principal Contractor, after which these reports shall be consolidated for submission to the Health and Safety Committee. H&S Representatives must be included in and be part of accident/incident investigations. H&S Representatives shall be members of at least one H&S Committee and must attend all meetings of that H&S committee.

12.8.3 Establishment of H&S Committee(s)

The Principal Contractor must establish H&S Committees consisting of designated H&S Representatives together with a number of Employers Representatives appointed as per Section 19(3) that are not allowed to exceed the number of H&S Representatives on the committee. The persons nominated by the employer on a H&S Committee must be designated in writing for such period as may be

determined by him. The H&S Committee shall co-opt advisory (temporary) members and determine the procedures of the meetings including the chairmanship.

12. HOUSEKEEPING

Good housekeeping will be maintained at all times as per Construction Regulation No. 25. Poor housekeeping contributes to three major problems, namely, costly or increased accidents, fire or fire hazards and reduction in production. Good housekeeping will enhance production time.

Particular emphasis is to be placed on the following crucial elements of a construction site:

- Phase priorities and production/plant layout
- Enclosures
- Pits, openings and shoring
- Storage facilities
- Effective, sufficient and maintained lighting and illumination
- Principal sources of injuries, e.g., stairways, runways, ramps, loose building material
- Oil, grease, water, waste, rubble, glass, storm water
- Color coding
- Demarcations
- Pollution
- Waste disposal
- Ablution and hygiene facilities
- First aid disposals
- Hazardous chemical substances

This is list must not be taken to be an exclusive or exhaustive

In promotion of environmental control all waste, rubble, scrap etc., will be disposed of at a registered dumping site and records will be maintained. Where it is found to be impractical to use a registered dump site or it is not available, the Principal Contractor will ensure that the matter is brought to record with the client or his representative, after which suitable, acceptable alternatives will be sought and applied. Dross capable of fermentation, putrefaction or constituting a nuisance shall be treated or disposed of by methods approved by an inspector.

13. OPERATIONAL CONTROL

The Principal Contractor shall take reasonable steps to ensure that necessary control measures are taken to promote a safe working environment during all operational works. Routine safety inspections shall be carried out to ensure plant, machinery and tools are safe enough for employees to work with. Operational control measures shall be taken for the following activities and plant or machinery where applicable:

- Fall protection;
- Excavation work;
- Scaffolding;
- Mobile plants;
- Electrical installation and machinery; and
- Other associated activities

14. SUB-CONTRACTORS

The Principal Contractor shall ensure that agreements are entered into by all sub-contractors on site, and ensure that all sub-contractors are in compliance with the health and safety standards on site. Particulars of sub-contractors involved in specialized work such as blasting, concrete works and electrical installations must be submitted to the designers for approval and their safety plans submitted to the Client for approval.

15. OFFENCES AND PENALTIES

Any contractor who does not comply with the requirements of the Act, will be penalized or punished as per Section 38 of the Act. The Principal Contractor must also note that the Client may stop the execution of construction work if it is not in accordance with the health and safety plan or if it poses a threat on the health and safety of employees and the public.

C6. Site Information

6.1. General

This section describes the site at the time of the tender in order to enable the tenderer to price his tender accordingly and to decide upon his method of working, programming and risks.

The tenderer shall inform him/her on the nature of the site and inspect the site.

The employer will consider a tender only if the site inspection and/or tenderer's meeting arranged by the Engineer has been attended by a representative who must:

- Be suitably qualified to comprehend the implications of the work involved, and
- Be the tenderer him/herself or a person in the direct employ of the tenderer

6.2 Site Location

Mzimuhle Settlement is located in the Thembisile Hani Local Municipality within the Nkangala District in the Mpumalanga Province.

The climate is very dry with an average annual rainfall below 500mm. General vegetation cover consists of sparse grasses and thorn trees scattered over the site. With thin vegetation cover, the area is susceptible to flood damage caused by sheet flow during heavy rains.

6.3. Access to site and restrictions

The construction sites are situated in the existing villages as mentioned in 6.1. These sites can be reached via existing streets/roads and Provincial Roads.

The operation of construction vehicles on existing roads or streets, or streets which have been completed on the level of sub-base or base or bituminous surface treatment, shall be limited to traffic with an axle load not exceeding that allowed by the Road Traffic Ordinance of the authority concerned, or any amendment thereof. Hauling is strictly forbidden on sections of streets that have been completed as described above. The Contractor shall make use of temporary haul roads, or where not practically possible, program his work in such a manner that the haulage of materials shall be restricted to that required for the particular section of the street. No additional payment shall be made for the use of temporary haul roads and all relevant costs shall be deemed to be covered by the appropriate rates.

The Contractor must note that no additional payment will be made for the construction of temporary access roads to the construction site, borrow-areas or to the spoil sites, except for payment made under item A.8.3.2.2 of SABS 1200A.

If the Contractor does not make use of existing streets for the hauling of materials to or from the site, he shall be held responsible to clear any spillage caused by his activities on or near the roads by whatever means necessary, within two (2) days after such spillage has occurred. No additional payment will be made for the clearance of spillage and all relevant costs will be deemed to be covered under the relevant items.

6.4 Existing services, servitudes and way leaves

All the known existing services are indicated on the drawings.

6.5 Security

The security of the Contractor's plant, employees, materials and site camp will be the Contractor's responsibility.

6.6 Nature of ground and subsoil conditions

The Contractor shall familiarize himself with the conditions on site.

The materials on site mainly consist of soft and hard material. The majority of excavation will be in weathered and hard granite.

Also refer to the Project Specification "*PS 4: NATURE OF GROUND AND SUBSOIL CONDITIONS ON SITE*"



C.7 Drawings

All drawings for the tendering process are available on request.