

CONTRACT DATA

**A contract between
SENTECH, Sender Technology Park, Radiokop, Octave Road, Honeydew,
and**

Appointment Of A Service Provider For The Construction And Installation Of Fire Protection And Detection System, Including Electrical And Civil Services At Sentech Head Office In Radiokop

Bid Number: SENT/037/2024-24

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Conditions of Contract GCC 2015 (General Conditions of Contract for Construction Works, 3rd Edition, 2015). (available separately)

PART C1: AGREEMENTS AND CONTRACT DATA –

Form of Offer and Acceptance Offer

Sentech, identified in the acceptance signature block, has solicited offers to enter into a contract for the **construction of upgrade on fire system services at Sentech Head Offices**.

The Bidder, identified in the offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Bid schedules, and by submitting this offer has accepted the conditions of the Bid.

By the representative of the Bidder, deemed to be duly authorized, signing this part of this form of offer and acceptance, the Bidder offers to perform all of the obligations and liabilities of the Bidder under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the Contract Data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF APPLICABLE TAXES; (in the Bids applicable currency).

_____ (amount in words);

_____ (amount in figures)

NB: The Prices quoted above is the total Bid offer inclusive of all applicable taxes for the Contract duration. The price must be carried over from the price breakdown / schedule of rates provided in the Bid document.

This offer may be accepted by Sentech by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the Bidder before the end of the period of validity stated in the Tender Data, whereupon the Bidder becomes the party named as the Bidder in the conditions of contract identified in the Contract Data.

Bidder's Signature(s) _____

Signed by the Bidder at _____ **on this the** _____ **day of** _____ **20** _____

Name(s) _____

Capacity _____

Address (Domicillium)

Acceptance

By signing this part of this form of offer and acceptance, Sentech accepts the Bidder's offer. In consideration thereof, Sentech shall pay the Bidder the amount due in accordance with the conditions of contract identified in the Contract Data. Acceptance of the Bidder's offer by the signature by Sentech shall form an agreement between Sentech and the Bidder upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1 Agreements and contract data, (which includes this agreement)

Part C2 Pricing data

Part C3 Scope of work.

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C3 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto as listed in the Bid schedules as well as any changes to the terms of the offer agreed by the Bidder and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this agreement. No amendments to or deviations from the said documents are valid unless contained in this schedule of deviations.

Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Sentech's Signature(s) _____

Signed by Sentech at _____ **on this the** _____ **day of** _____ **20** _____

Name(s) _____

Designation _____

SENTECH SOC LIMITED,
Sender Technology Park
Octave Road, Radiokop
Honeydew
Johannesburg

Date _____

Upon acceptance by Sentech of the Bidder's offer, a contract will come into existence.

SCHEDULE OF DEVIATIONS

Notes:

- 1 The extent of deviations from the Bid documents issued by the Sentech before the Bid closing date is limited to those permitted in terms of the conditions of Bid.
- 2 A Bidder's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.
- 3 Any other matter arises from the process of offer and acceptance either as a confirmation, clarification or change to the Bid documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.
- 4 Any change or addition to the Bid documents arising from the above agreements and recorded here shall also be incorporated into the Contract.

1. **Subject** _____

Details _____

2. **Subject** _____

Details _____

3. **Subject** _____

Details _____

4. **Subject** _____

Details _____

By the duly authorised representatives signing this schedule of deviations, Sentech and the Bidder agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Bid schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the Bidder and Sentech during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the Bid documents and the receipt by the Bidder of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

Contract Data

Part one - Data provided by Sentech given in all contracts

1. The *Purchaser* is

SENTECH SOC LIMITED,

Sender Technology Park

Octave Road

Radiokop

Honeydew

Johannesburg

2. General

The National Treasury General Conditions of Contract for goods and services (NT GCC, 2010) or General Conditions of Contract for Works (2015) as issued by National Treasury and the Construction Industry Development Board of the Republic of South Africa apply, respectively.

The goods are specified in the Scope of Work. The Special Conditions of Contract (SCC) are stipulated in the Tender Data.

3. Goods information:

The *Goods Information* is in the document called "Scope of Work" and in the documents and drawings referred to by it.

4. Terms of Delivery

The *Terms of Delivery* are contained in the General Conditions of Contract (GCC) and Special Conditions of Contract.

5. Language

The *language* of this contract is English.

6. Governing Laws and Jurisdiction

The Contract shall be governed by and interpreted according to the laws of the Republic of South Africa.

In the event of a conflict between or inconsistency in the laws applicable in the various provinces of the Republic of South Africa, the law as applied and interpreted in the Gauteng Province shall prevail.

The parties irrevocably submit to the exclusive jurisdiction of the South Gauteng High Court, Johannesburg in respect of any action or proceeding arising from this Bid.

This Bid and all contracts emanating there from will be subject to the General Conditions of Contract issued in accordance with Treasury Regulation 16A published in terms of the Public Finance Management Act, 1999 (Act 1 of 1999). The Special Conditions of Contract are supplementary to that of the General Conditions of Contract. Where, however, the SCC are in conflict with the GCC, the SCC shall prevail.

7. Sub-contracting post award

A Bidder awarded a Bid may only enter into a subcontracting arrangement with the approval of Sentech. The successful bidder may not subcontract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level of contributor than the Bidder concerned, unless the contract is subcontracted to an EME that has the capability and ability to execute the subcontract.

8. Transformation Plan

A transformation plan is a record of activities an entity intends to undertake to improve its BBBEE Level through Ownership, Management and Control; Skills Development; Enterprise and Supplier Development and Socio-Economic Development.

Sentech reserves the right to request a BBBEE transformation plan with clearly defined timelines and milestones if the recommended bidder does not meet Sentech's transformation goals. These milestones

must be achieved over the term of the contract. This transformation plan shall be submitted within 10 working days from the written request, failing which Sentech reserves the right to withdraw its appointment of the preferred recommended Bidder.

9. Warranty

The warranty period is 12 months after Delivery.

10. Payment

The method and conditions of payment are contained in the Tender Data, GCC and SCC.

The interest on late payment is 0 % per complete week of delay.

11. Rate of Exchange, Currency Fluctuations and Currency

All bid prices quoted shall be in South African Rands (ZAR). If prices are in a foreign currency, the rate of exchange quoted shall remain fixed throughout the term of the agreement. Bidders will bear the risk of and all cost/s associated with currency fluctuations, therefore Bidders shall be required to manage such risk in their bid price.

12. General - Prices

All prices shall be quoted in ZAR.

Unless written approval has been obtained from Sentech, no adjustment in contract prices will be made. Applications for price adjustment must be accompanied by documentary evidence in support of any adjustment.

13. Price Negotiations

Sentech reserves the right to negotiate market related prices and discounts. If market-related prices are not agreed to, Sentech reserves the right to cancel the Bid.

14. Liabilities indemnities and insurance

Insurance is required from the Bidder in respect of delivery and transportation where applicable.

15. Disputes

Should any dispute, disagreement or claim arise between the parties ("the dispute") concerning this Agreement, the parties shall try to resolve the dispute by negotiation. This entails one party inviting the other party to meet and attempt to resolve the dispute within fourteen (14) days from the date of the written invitation.

If the dispute has not been resolved by such negotiation as referred to in this clause above, the Parties shall submit the dispute to the Arbitration Foundation of Southern Africa ("AFSA") for administered mediation, upon the terms set out by the AFSA secretariat.

Failing such resolution, the dispute shall be resolved by arbitration in accordance with the rules and procedures of AFSA by an arbitrator appointed by AFSA. Where the arbitration route is followed, the dispute must be adjudicated within Johannesburg in the English language and finally resolved in accordance with the rules of AFSA, by an arbitrator or arbitrators appointed by that Foundation.

The provisions of this clause shall not preclude any party from obtaining relief from a Court of competent jurisdiction. To this extent, the Parties hereby consent to the jurisdiction of the South Gauteng High Court, Johannesburg, South Africa. The provisions of this clause shall continue to be binding on the Parties, notwithstanding any termination or cancellation of this Agreement.

16. Termination

Sentech shall have the right, at its sole and exclusive discretion, upon written notice to the Bidder, to terminate this Agreement, in whole or in part should the Bidder fail to perform any of its obligations or deliver any deliverable timeously or should Sentech not be satisfied with the quality of any service/s in terms of this Agreement, to the satisfaction of Sentech.

Sentech shall furthermore have the right, as a result of such termination, to appoint a third party to perform the obligations of the Bidder in terms of the Agreement and the Bidder indemnifies Sentech against all costs incurred by Sentech in appointing such third party to fulfil the obligations of the Bidder.

Sentech shall have the right, at its sole and exclusive discretion, to terminate this Agreement, at any time, upon 30 (thirty) days' written notice to the Bidder.

17. Contract Term

This contract will run for a period of **twelve (12) months**

18. Supplier Due Diligence

Sentech reserves the right to conduct supplier due diligence at any time pre, during and post the contract period. This may include announced or unannounced site visits.

19. Cession

Sentech shall be entitled to cede, delegate, assign, charge, transfer or otherwise dispose of this Agreement or any rights or obligations therein in whole or in part, upon prior written notice to the Bidder.

20. Monitoring and Evaluation

The service delivery and performance of the Bidder will be monitored and evaluated by Sentech at all relevant times. In the event that the Bidder defaults in any manner or form, Sentech reserves the right to blacklist the Bidder on the National Treasury Database of Prohibited Suppliers and Tender Defaulters, and to take such further steps as may be warranted in the circumstances which steps shall be determined at Sentech's sole and exclusive discretion.

21. Protection of Personal Information Act No. 4 of 2013 ("POPI")

Sentech is POPI compliant and the Bidder will ensure that it conducts itself within the prescripts of the prescribed legislation.

Should Sentech need to collect Personal Information by law or in consideration of the Tender, and the Bidder fail to provide the Personal Information when requested, Sentech may refuse to accept the relevant services from the Bidder, and the Bidder will be notified in this event.

By agreeing to the terms of this Agreement, the Bidder voluntarily authorizes Sentech to process its' personal information (including its' name, credit card & banking details, physical address, telephone numbers, reference letters & any other information it has provided to Sentech) for purposes of Tendering and contracting.

The Bidder consents to the transfer of such personal information to third parties.

This consent is effective immediately and will endure until the relationship between the Bidder and Sentech has been terminated.

The Bidder indemnifies and holds Sentech harmless against any loss, whether direct or indirect, arising out of the failure to process any of its' personal data in accordance with applicable laws.

22. Delay damages

As stipulated in the Special Conditions of Contract.

Sentech's Representative is

Name: Mr. Zunaid Adams

Address: **SENTECH SOC LIMITED**

Sender Technology Park

Octave Road

Radiokop

Honeydew

2040

Johannesburg

Tel No. 0114714400

Sentech's Representative is the Executive: Legal and Regulatory.

Contract Data

Part two - Data provided by the Bidder

Statements given in all contracts

The Bidder is:

Name _____ Address _____

a company / close corporation / partnership duly incorporated in accordance with the laws of the Republic of South Africa.

PART C2: PRICING DATA

Price List

Refer to Annexure 1 (Bill of Quantities)

PART C3: SCOPE OF WORK

SENTECH'S GOODS INFORMATION

NOTE TO BIDDERS: DUE TO A SECURITY ISSUE, THE TENDER DRAWINGS COULD NOT BE ISSUED TO THE BIDDERS. NONETHELESS, AT THE BRIEFING, THE DRAWINGS WILL BE SHOWN.

1. TECHNICAL REQUIREMENTS

1.1. Glossary of Terms

Abbreviations	Descriptions
COC	Certificate of Competence
SAQCC	South African Qualification & Certification Committee
O&M manuals	Operation & Maintenance Manuals

2. INTRODUCTION

Sentech is a state-owned company and is the largest broadcasting signal distributor in Africa. Sentech is a licensed Electronic Communications Network Service provider in South Africa and currently operates number of communication networks from which Internet access is provided for customers and internal use.

This project entails bringing the facility at Sentech Head Office, Radiokop, to code by designing and constructing a firefighting system which complies with the relevant city by laws, NFPA, ISO as well as SANS codes.

This document pertains to the Fire Detection and Protection installations in the mentioned building.

The Fire Protection and Detection responsibilities are stipulated in this document as stipulated for all work that falls under the Fire Installation of this project.

The contractor is responsible to make sure that civil and electrical works are all included in order for all the fire system services to be installed and fully operational.

3. SCOPE OF WORK

Responsibilities of the contractor

The contractor shall be responsible for the following:

- **Fire Hose Reels**
- **Fire Extinguishers**
- **Fire Safety Signage**
- **Fire Detection**
- **Gas Suppression System (Server Room)**
- **Fire Detection System**
 - a. Fully Addressable Analogue Control Panel.
 - b. Ionization Smoke Detectors as shown on the drawings.
 - c. Photoelectric (Optical) Smoke Detectors as shown on the drawings.
 - d. Alarm Sounder Devices.

- e. Break Glass Units.
 - f. Radio Links.
 - g. All equipment needed to make this a fully workable system.
- **The civil and electrical works to make the fire system services installation fully operational.**

3.1. Location



Figure 1: Project location.

4. FIRE INSTALLATION – DESIGN/INSTALLATION STANDARDS

4.1. Compliance/Standards for Fire Protection and Detection

The design and installation for Fire shall adhere to the following standards and related codes of practice.

- SANS 10400: Part T: 2024: Fire protection,
- SANS 10400: Part S: 2011 Edition 3: Facilities for persons with disabilities,
- SANS 10400: Part W: 2011 Edition 3: Fire installations,
- SANS 10140: 2003 Edition 3: Identification Color Markings: Contents of pipelines,
- SANS 1253: 2016 Edition 3.1: Fire-doors and fire-shutters,
- SANS 1186-1 :2015 Edition 3.7: Symbolic safety signs: Standard signs and general requirements,
- fire detection and alarm system. Design and install in accordance with SANS 10139,
- SANS 543: 2015 Edition 5.0: Fire hose reels,
- SANS 10105-1: 2010 Edition 3.01: The use and control of fire-fighting equipment Part 1: Portable and wheeled (mobile) fire extinguishers,
- SANS 1475-1: 2010 Edition 3.04: The production of reconditioned fire-fighting equipment Part 1: Portable and wheeled (mobile) rechargeable fire extinguishers,
- SANS 1128-1: 2010 Edition 2.01: Firefighting equipment Part 1: Components of underground and above-ground hydrant systems,
- SANS 10105-1: 2010 Edition 2.01: The use and control of fire-fighting equipment Part 1: Portable and wheeled (mobile) fire extinguishers,
- SANS 1475 -1: 2010 Edition 3.04: The production of reconditioned fire-fighting equipment Part 1: Portable and wheeled (mobile) rechargeable fire extinguishers,

- with SANS 10105-1: 2010 Edition 3.01: The use and control of fire-fighting equipment Part 1: Portable and wheeled (mobile) fire extinguishers,
- SANS 1910: 2009 Edition 1.02: Portable refillable fire extinguishers,
- SANS 1567: 2014 Edition 2.02: Portable rechargeable fire extinguishers - CO2 type extinguishers,
- SANS 193: 2013 Edition 2.02: Fire dampers

5. FIRE SAFETY OBJECTIVES

The major goal is to make sure that the building's residents may leave without inhaling dangerous fire gasses or suffering serious injuries as a direct result of a potential fire.

The following conditions must be met in order to accomplish the key goal:

- To establish the fire safety measures of the buildings
- To provide sufficient access, equipment for detecting, fighting, controlling, and extinguishing a fire when needed.
- To minimize the spread of smoke
- To ensure the protection of and safe evacuation for building occupants
- To provide sufficient first aid fire equipment

6. BUILDERS WORK

- It shall be the responsibility of the Engineer to provide the main contractor of required builder works such as openings in walls, plinths etc.
- It shall be the contractor's responsibility to ensure that these openings are requested well in advance.
- It shall be the contractor's responsibility to provide sleeves, one sleeve for power cabling and the other for control or electronic cabling. etc. where required.
- All fixing brackets and supports shall remain the responsibility of the contractor to ensure it is appropriate for intended purposes.
- Fixing brackets shall be appropriate for the size and weight of the equipment and shall be installed level; all brackets shall be of similar construction and shall be neat, tidy and weather-proof.

7. COORDINATION OF SERVICES

Although coordination of services is the responsibility of the principal agent, it is the responsibility of the contractor to inform the engineer of potential clashes that may occur on site.

8. MATERIALS AND WORKMANSHIP

- All work is to be executed with new materials of the best quality and in the most substantial manner under the inspection and to the entire satisfaction of the Engineer.
- The entire installation shall be in accordance with the following:
 - The National Building Regulations and Building Standards Act No. 103 of 19 as amended in 1990 and all amendments thereafter.
 - The latest revision of SANS 10400: The Applications of the National Building Regulations, as amended.
 - SANS 10142: 2008: Code of Practice for the Wiring of Premises
 - The Occupational Health and Safety Act No. 85 of 1993 (OHS Act) as amended in 2008 and all amendments thereafter.
 - Any other relevant by-laws of local or other authorities having jurisdiction.

All apparatus, components parts, fittings and materials supplied and/or installed whether especially specified herein or not shall conform in respect of quality, manufacture, tests and performance with the requirements of the appropriate current South African (SABS) or SANS (South African National Standards) or British Standard Specifications (BS) and Addenda thereto, except where otherwise required by this specification or permitted by approval of the Engineer in writing.

All materials and workmanship which may, in the opinion of the Engineer, be inferior to that specified for the work will be condemned. All condemned material and workmanship must be replaced or rectified, to the satisfaction of the Engineer.

No second hand or used equipment or material of any description may be offered for supply or installation on any of the Client's contracts.

The Contractor shall, upon request by the Engineer, or where specifically called for in the detail specification, submit such samples of material and equipment as called for, all in good time and before installation thereof. The Engineer may retain such samples until the completion of the contract.

All work shall be executed in a first-class manner by qualified tradesman.

All components and their respective adjustment, which do not form part of the equipment installation work but influence the optimum and safe operation of the equipment shall be considered to form part of and shall be included in the Contractor's scope of works.

Any fitting or item of equipment not specifically mentioned but obviously necessary for the successful completion and operation of the installation is to be included to form a complete and working installation.

9. SAMPLES AND SUBMISSIONS

The following samples with technical data shall be required, should the tenderer be successful and shall be subject to approval, prior to the ordering thereof:

- Smoke Detectors
- Alarm Units
- Break Glass Units
- All Signage

The following components will require technical submission and approval thereof, prior to ordering, but is not limit to the following:

- Addressable Control Panel
- Control Software
- Fire Hydrants
- Fire Hose Reels
- Smoke fan details server room where there are gas suppressions systems.

10. DRAWINGS

10.1. TENDER DRAWINGS

Due to a security issue, the tender drawings could not be issued to the bidders. Nonetheless, at the briefing, the drawings will be shown.

Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.

Positions of all equipment will be shown on the drawings that will be issued to the appointed contractor and are to be verified by the Contractor on site prior to manufacture or installation of any equipment etc.

Once the tender is awarded to the bidder, the drawings will be presented for services and disciplines such as the Fire Engineer, Structural Engineer, Electrical Engineer, Wet Services Engineer (for domestic line), etc.

10.2. CONTRACTOR'S DRAWINGS

Where called for in the detail specification these drawings are to be prepared by the Contractor at his expense in accordance with this document and shall be on a scale of not less than 1:50.

Drawings shall be prepared in a Revit programme namely, Revit 2022/23 or newer and shall be made available in soft and hard copies.

Prior to construction and ordering drawings and design calculations for the components shall be submitted to the Engineer for approval. The grade of material for all components shall be specified on the drawing.

THESE DRAWINGS SHALL BE COMPRISED OF:

A. Builder's Work Drawings

These shall indicate all work to be done by others (bases, foundations, holes in concrete and masonry, etc.) as well as the sizes, capacities and positions of service connections (electrical, water, drainage, etc) to be provided by others, all in accordance with the supplementary specification.

Positions and sizes of air grilles, louvered openings through reinforced concrete beams and slabs, etc., as indicated on the tender drawings during briefing shall be adhered to as far as possible. Amendments will only be considered if unavoidable.

B. General Arrangement Drawings

These shall indicate all equipment, distribution systems, testing and inspection requirements as well as instrumentation positions and access requirements.

During their preparation, the Contractor shall take cognizance of all relevant architectural, structural, electrical and other services drawings in order to properly co-ordinate his layout. These drawings can be obtained via the Engineer. The drawings shall be amended as required during the contract period, and up to date hard copies kept on site for reference purposes.

C. Shop Drawings

These shall be based on the General Arrangement drawings and shall show in detail the construction of all the parts of the works, method of assembly where applicable, erection and construction, materials and connections, welds, gaskets, sealants, fastenings, reinforcing and all other necessary detail.

D. As-Built Drawings

These are up-to-date approved drawings at the completion of the contract. Tenderers shall allow in their price for submitting to the Engineer a USB containing each of the up-to-date general arrangement drawings, shop drawings, as well as electrical and control drawings together with the O&M manuals specified herein.

11. SUBMISSION OF CONTRACTOR'S DRAWINGS:

Drawings shall be submitted to the Engineer in orderly fashion commencing within the following time limits or as determined by the main contract programme (where applicable):

Builder's work drawings	within 2 weeks of tender acceptance.
General layout drawings	within 3 weeks of tender acceptance.
Shop drawings	within 3 weeks of tender acceptance.
Electrical drawings	within 3 weeks of tender acceptance.
As-built drawings	at completion before first-hand over.

By submitting drawings, the Contractor represents that he has determined and verified all site measurements, site instruction criteria, materials, catalogue numbers and similar data, or will do so, and that he has checked and coordinated each of his drawings with the requirements of the works and the contract documents, taking into account drawings of all other relevant disciplines.

At the time of submission, the Contractor shall inform the Engineer in writing of any deviation in the Contractor's drawings from the requirements of the contract documents.

The Engineer will review and approve drawings with reasonable promptness (so as not to cause a delay) only for conformance with the design concept and the contract requirements.

The contractor shall allow a minimum of 4 workdays for the engineer to review and approve drawings in the construction program.

The Engineer may, at his discretion and depending on the number of discrepancies, require amendment and resubmission prior to approval. Drawings shall be resubmitted until approved prior to any portion of the works related to the drawings being commenced.

Should the Contractor during drawing amendment, alter any portion of his drawings not specifically required by the Engineer; he shall point this out in writing when resubmitting the drawing.

Approval of the Contractor's drawings in no way indemnifies him from being responsible for the correctness of the drawings and satisfactory operation of the installation.

12. SITE CONDITIONS

It is the responsibility of the Tenderer to visit the site during the tender phase and to familiarize himself with conditions related to it. If the location of the site is not indicated in the detail specification, it can be obtained from the Engineer. No claim for additional payment related to ignorance of site conditions will be accepted. By submitting a tender, it is accepted that the Tenderer is fully aware of all site conditions as well as the access to it and has allowed for this in his tender price.

13. DEVIATIONS FROM TENDER DOCUMENTS

No deviations or alterations from that of the detail and standard specification, schedules or drawings shall be made without first obtaining the written approval of the Engineer.

14. MANUFACTURER'S RATINGS

All equipment such as fans, pumps, motors, water tank, etc., shall be selected to be in acceptance by the Fire Engineer. Equipment offered for use beyond these limits will not be considered.

Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.

15. NOTICES AND SIGNS

The Contractor shall supply and install all notices and warning signs that are required by the appropriate laws or regulations and by these documents.

All instructions and signs provided together with instruction manuals shall be in English.

16. COMMISSIONING AND TESTING STEPS

16.1. Commissioning Engineers

The Tenderer shall allow in his tender price for the services of approved and expert Commissioning Engineers, as may be appropriate for the individual specialized sections of his contract, as well as a competent Engineer in overall control of the installation. Testing and commissioning shall be carried out by these Engineers.

Should undue problems be encountered at any time, the Contractor may be requested by the Engineer to obtain the services of a representative of the manufacturer of specified items of equipment, at no cost to the Client.

16.2. Notice of Testing and Commissioning

The Engineer shall receive not less than 7 days advance notice of any tests to be witnessed by the Engineer.

16.3. Quality Testing of Equipment

The Engineer reserves the right to arrange for testing of any piece of equipment at will, to check on compliance with the relevant specifications. The client should be informed if there is a need to attend the testing, otherwise all test papers should be presented upon delivery of an equipment.

The client has the right to request for testing of equipment should there be any major dents on the delivery of an equipment. However, should the equipment fail the test, the cost of the test, rectification of the shortcomings, re-testing and repetition of the same test on the remaining like items will be for the Contractor's account.

16.4. Inspection during Manufacture

The Contractor will advise the Engineer when the items to be supplied are in the course of manufacture. The Engineer reserves the right to inspect any items during the course of manufacture and witness any performance tests that may be required thereon. The Contractor shall give the Engineer at least 7 (seven) days advance notice of works tests.

16.5. Testing

The Contractor shall be responsible for carrying out all tests laid down in the specific sections elsewhere in this document, in addition to that listed hereafter and in the detail specification.

Testing and balancing shall not begin until the system has been completed and is in full working order.

The plant shall be tested and operated to meet the performance figures and duties specified.

All safety features and interlocks will be tested.

The Contractor will be responsible for all costs incurred in the testing, including the supply, calibration and use of all instruments and tools, but not the supply of water or power on site.

All instruments and test equipment used shall be provided by the Contractor and shall be accurately calibrated and maintained in good working order. All test instruments used for tests to be witnessed by the Engineer shall be provided with calibration certificates, if called for by the Engineer.

Specific attention is drawn to the fact that calibration certificates will be required for the following and all meters shall be in SI units:

Watt meters, ammeters, voltmeters, frequency meters, pressure gauges, flow meters, orifices plates, temperature gauges and dynamometers.

All instruments shall be of above standard grade, and test pressure gauges shall not be less than 150mm in diameter. The maximum scale of the instrument shall not exceed 1.5 times the full test requirement.

It is essential that the Contractor inspects and tests all equipment before requesting the Engineer to inspect or witness acceptance tests thereon.

All acceptance-tests, whether in the manufacturer's workshop or on site, must be carried out in the presence of the Engineer.

Should the Engineer wish to verify the calibration of any instruments, the Contractor shall make the necessary arrangements for the instrument to be re-calibrated by a recognized authority. Should the instrument prove to be correctly calibrated, the cost of the re-calibration test will be borne by the Client. Should the instrument prove to be in error, the cost of the tests will be borne by the Contractor.

Two copies of the complete test reports shall be submitted to the Engineer, prior to the first delivery of the project. Reports shall cover all tests carried out on individual sections, including such works tests as may have been conducted. All reports shall be neatly typed.

17. COMMISSIONING

The Contractor shall carry out all tests and commissioning of the systems installed by him, in a coordinated and properly organized manner.

18. TESTING

All fire piping shall be Class 16 HDPE underground and Class 16 steel piping above ground, no copper piping, and shall be tested in the presence of the Fire Brigade at 20bar for at least 1 hour.

Flow measurements are required on the ventilation system to proof the required airflows are reached.

Should the tests be carried out over an area outside the range of normal speech, it is required that the Contractor make available at least four battery powered, two-way radio sets, to facilitate communications.

The testing procedures shall be sufficiently comprehensive to prove the correct functioning of each and every piece of equipment, and its suitability for the application.

After all systems and equipment have been tested and commissioned to the satisfaction of the Engineer, a detailed demonstration of all functions of the system shall be carried out in the presence of the Client Representative, so as to allow him to become fully acquainted with the operation of the system.

The Contractor shall allow for the replacement and cost of any materials and fuel used for testing purposes, as part of the contract.

The demonstration to the users shall include a repeat of the operational tests above.

The planning of this demonstration shall take place in collaboration with the Engineer.

A certificate of completion will not be issued until all tests have been satisfactorily completed, and the plant has operated successfully, to the complete satisfaction of the Engineer. The COC for the Fire detection must be issued by a SAQCC Registered Person to the Engineer.

19. PERFORMANCE TOLERANCE

All performance figures obtained during testing and commissioning must be within -0% and +5% of the specified performance figures given in the supplementary specification. Should the equipment fail to comply with these figures after it has been tested and operated for a period of seven days, then the Contractor shall have a further four weeks to meet the requirements of the specification, after which the Engineer shall have the right to reject the equipment/plant and the retained portion of payments will be held until such is sorted.

20. TEST CERTIFICATES

The Contractor shall ensure that copies of all relevant test certificates, inspection reports, materials analysis certificates and similar data as may be required under various sections of this specification, or by Government Licensing and Inspection Authorities or Local Authorities, shall be provided before handing over the equipment/plant. Acceptance of the plant will be delayed if such certificates are not available.

21. APPLICATION FOR INSTALLATION

The Contractor shall allow for the submission of the necessary forms, fees and drawings to the Inspector of Machinery or other relevant Authorities to obtain permission to install equipment where this is required. He shall also, in co-operation with the Engineer make any arrangements that may be required for Government Inspectors or other relevant Inspectors to carry out prescribed tests.

The Contractor shall provide a certificate of compliance for the electrical work forming part of his works.

22. SERVICES ACCESS

Where equipment such as fans, dampers, etc. is installed above ceiling the Contractor shall ensure that access will be possible for maintenance purposes after installation.

23. FIRE PROTECTION REQUIREMENTS

23.1 OCCUPANCY CATEGORY

As per SANS 10400-A, Table-1, the building will fall into category G1.

23.2 DIVISION AREAS

All penetrations between floors will be fire sealed to prevent fire spread from one floor to another.

23.3 FIRE STABILITY OF STRUCTURAL ELEMENTS OR COMPONENTS

All structural building components will have a structural stability rating of at least 60 minutes as per the requirement, Table 4 SANS 10400-T.

23.4 FIRE & EXIT DOORS

As per requirement, the emergency route will use class B fire doors.

The exit doors are opening in the direction of travel along the escape route 4.17.2 a

The clear width of an exit door or escape door is more than 750mm and acceptable.

All fire exit doors will be equipped with approved locking mechanisms that can be opened in a single motion without the need for special tools. Where installed, magnetic door locks will have overriding "BREAK GLASS" boxes that, when triggered or broken, will cut off the electricity to the magnet to release the door or doors.

Additional security doors where possible required will all be locked in open positions when the buildings are occupied in accordance with SANS 10400 -T, section 4.16.11.

23.5 ESCAPE ROUTES

The main building upper storey offices (Block A, B and C) is equipped with an emergency route in accordance with 4.16 c, and the travel distance to the nearest escape door is less than 45m.

According to SANS 10400-T, section 4.16.11, all additional security doors that are necessary will, whenever feasible, be locked in the open position when the building is occupied.

23.6 WIDTH OF ESCAPE ROUTES

The building width/ corridor is wide enough and permitted for the escape route as shown on SANS10400-T, Table 09.

23.7 STAIRWAYS & CHANGING OF LEVEL ALONG ESCAPE ROUTES

Deemed to satisfy rule SANS10400 -T, section 4.23 will be compiled with.

23.8 VENTILATION OF STAIRWAYS IN AN EMERGENCY ROUTE

The building does not exceed 30m in height. The enclosed stairway will not be pressurized but the window is provided for natural ventilation to the outside of the building at each storey level.

23.9 CEILINGS

All ceilings, where installed will be generally non-combustible. The ceiling void will not require any sub-division as it is far less than 500m² and do not exceed 30 meters in length. Therefore, no fire stops will be required according to the SANS10400-T section 4.13.2.

23.10 FLOOR COVERINGS

All floor coverings will comply with SANS 10400-T, 4.14.

23.11 MARKING AND SIGNPOSTING

All marking and signposting will comply with SANS 10400 – T, 4.29.

23.12 PROVISION OF EMERGENCY LIGHTING AND POWER SUPPLY

The escape route will be provided with a lighting to comply with SANS 10400-T, 4.30. According to the applicable standards of SANS 10114-2 and SANS 1464-22, emergency light sources and emergency power supply, the minimum emergency lighting levels on escape routes, and emergency lighting design must all be compliant. (Electrical Engineer will design).

23.13 FIRE FIGHTING EQUIPMENT – HYDRANT

The fire hydrants are provided in all areas surrounding the building as shown on the Site Development Plan (SDP) drawing at a rate not less than one per 1000m² and inside the main block building because of the floor area size.

23.14 FIRE FIGHTING EQUIPMENT – HOSE REELS

- The hose reel shall be such that the tubing is permanently connected, via pipes in the drum of the hose reel and such stuffing boxes as may be necessary to the supply main or the hydrant supply main.
- The internal bore of the hose reel tubing shall be not less than 19 mm, such tubing shall have a bursting pressure of not less than 2 700 kPa and shall not be porous nor exhibit any sign of percolation under pressure up to 2 000 kPa.
- The tubing of every hose reel shall not exceed 30 meters in length and be capable of being wound round a drum of not less than 150 mm in diameter and led around sharp obstructions without kinking. When fitted with hose reel nozzle, the tubing shall be capable of projecting a jet not less than 6 meters in length.
- The hose reel nozzle shall have a 4.5 mm orifice and be fitted with a simple two-way valve to open or shut off the jet. The valve shall not be spring-loaded.
- Hose reel drums shall be painted in red. The hose reel assembly shall be robust in construction and be capable of withstanding normal impact and stress during operation.
- Rising mains and associated pipework used for the hose reels shall be not less than 40 mm nominal bore and pipes feeding individual hose reel shall not be less than 25 mm nominal bore. A hose reel shall be so installed that its control valve and nozzle, which should be situated adjacent to each other, are at a position above and not more than 1 350 mm from the finished floor level. The nozzle of hose reel shall reach any parts of premises unless otherwise specified.
- For a recessed type of hose reel, such control valve and nozzle may be recessed to a discernible.
- Fire Hose reels shall comply overall with the requirements as contained in SANS Code of Practice 543:2015

23.15 FIRE FIGHTING EQUIPMENT – FIRE EXTINGUISHERS

A. DRY CHEMICAL POWDER EXTINGUISHERS

- The extinguishers shall be filled with mono-ammonium phosphate powder and shall be kept under

nitrogen pressure.

- Each extinguisher shall be 4.5kg capacity and shall be rechargeable.
- The extinguishers shall meet or exceeds requirements of ANSI/UL 299 and 711, or ULC S504 or S508. Each unit shall be USCG approved and shall be supplied with proper approved wall hanging brackets.
- Each extinguisher shall have a durable red powder paint finish and shall be fitted with tough, glare-resistant, one-piece mylar nameplates.
- Each unit shall be supplied with a Six-year limited warranty from date of delivery to original end-user or purchaser.
- Dry Chemical Powder type fire extinguishers shall comply overall with the requirements as contained in SANS Code of Practice 10105-1:2010 and 1910:2009.
- The fire extinguishers will be mounted on the backing boards and enclosed in the cabinets.

23.16 FIRE FIGHTING EQUIPMENT – FIRE SAFETY SIGNAGE

- All signs shall comply with local authority and regulations. All sign blanks shall have appropriate radius. All sharp edges are to be rounded.
- Mounting slots shall be equal and shall be centrally located on the signs.
- Finished signs and symbols shall be applied to 1.63mm utility grade aluminum with bright white mill baked finish on both sides. All inks shall be glossy.
- Fire safety signage shall comply overall with the requirements as contained in SANS Code of Practice 1186-1:2015.
- Escape related signage shall be of the photo-luminescent type and shall comply overall with the requirements as contained in SANS Code of Practice 1186-2:2007.

23.17 AUTOMATIC FIRE DETECTION & ALARM SYSTEMS

- The Building shall be equipped with a fire detection system, consisting of a fully addressable analogue control panel connected to various detection and alarm devices. The system shall be installed with the objective to protect both life and property and monitor for any fire 24 hours of the day. The complete installation shall be designed, installed and commissioned according to the SANS 10139: 2012 rev3.2 or later standard by a SAQCC certified contractor or supplier's personnel.
- The systems shall all be category L1 type system installed throughout all areas of the Building. Category L- These are automatic fire detection systems intended for the protection of life. The control panel shall be installed against the wall in the room area under the ceiling. Each detector will be able to cover a floor area of not more than 75 m² in low risk area and storage areas. Any area/room larger than 1 m² will have detection installed. Ceiling and floor void areas with a height EXCEEDING 800 mm will be detected.
- Heat detectors shall be employed in all kitchen areas (except in for kitchens connected to bedrooms). Each heat detector will be able to cover a floor area of 40 m² in low risk areas. Red resettable break glass units with transparent hinged flap and seal, shall be installed at each fire exit door, which will be activated by building occupants during emergencies.
- Combination electronic sounder/beacon units installed under the ceiling shall alert building occupants of an emergency. Dedicated fire-resistant cabling rated to provide flame resistance for 30 minutes shall be installed in a dedicated PVC conduit that is labelled "Fire".

- An automatic radio link to the local fire department shall be included as part of the installation of the system.

23.18 GAS SUPPRESSION SYSTEM

- The fire suppression system should be installed according to the standards.
- Flame proof ventilation fan system required. This fan shall run continuously and shall have a Class H motor installed. The switching of the fan shall be done from a switch outside the door.
- The louvres in the wall shall have vermin proof and shall be weather louvres.

24 ELECTRICAL SCOPE OF WORK

The proposed electrical scope of work shall comply with all applicable SANS standard specifications and putting into service the following at the Sentech Fire Pump Room as a minimum:

- Complete LV Distribution Board to feed all associated electrical loads such as small power and lighting, fire tank DB, as a minimum.
- Complete LV cabling and associated cable support systems, trenching, ducts, sleeves, sealing systems etc. to connect all electrical equipment related to this project.
- Complete service detection and protection along the cable routes.
- Complete small power and lighting in the Pump Room building as indicated in the electrical drawings.
- Complete equipotential bonding and earthing system, to protect all electrical equipment on site and connect the new earthing system to the existing earthing system.
 - Complete lightning protection system, including installation of surge protective devices at both the Car Wash DB and the Pump Room DB.
- Interfacing of electrical equipment with mechanical equipment

24.1 Electricity Supply

- The existing Car Wash DB which would be upgraded will supply the new Pump Room DB. There's available space on the Car Wash DB to add the 63A triple pole MCB to supply the new Pump Room. The contractor shall ensure that the Dehn Guard or similar Surge Protective Devices class 1+2 are installed in the Car Wash DB. The supply cable size is a 16mm² 4core PVC/PVC/SWA/PVC Cu cable and 16 mm² BCEW 60m long, from the Car Wash DB to the Pump Room DB.
- The Pump room DB shall be designed as per the Pump Room Single Line Diagram.

24.1.1 Low Voltage Distribution Board

- The new Pump Room distribution board will be provided with at least the following circuits:
 - a) Fire Tank DB
 - b) Domestic Water Tank DB
 - c) Jockey Pump
 - d) Lighting
 - e) Socket outlets
- The contractor shall ensure that they select circuit breakers that are recommended by the client's electrical specification i.e. Schneider, CBI or similar.
- The client shall provide a panel of contractors used to manufacture the distribution board to guarantee consistent manufacturing standards nationwide.

- The circuit breaker from the Car Wash DB feeding supply to the Pump Room DB as indicated on the drawings shall be of the same make as the existing circuit breakers in the Car Wash DB.
- All glands shall be stainless steel, no plastic glands shall be accepted.

24.1.2 Cabling and associated works

- All required power and control cables will be provided for the Pump Room.
- Cables entering and exiting the building will be installed in cable transit systems to reduce the risk of water ingress into the building.
- Cables will be installed on cable racking wherever possible.
- Cable trays shall be powder coated electric orange for all indoor installations. Outdoor installation shall be hot-dip galvanized steel. No mild galvanized steel shall be accepted.
- A 25 x 3mm copper strap to be installed on Electrical cable trays.

24.1.3 Cable trenching

- The Contractor shall be responsible for providing cable trenches in all soil conditions, ducts, etc. as per the requirements.
- The contractor shall plan his final cable routes and shall carry out service detection along the proposed route to ensure that no services will be obstructed when installing this cable route.
- . All trenches shall be minimum 500mm deep.
- The contractor shall prepare a quality control plan with witness and hold points at the following stages:
 - a) Excavation of cable trenches and preparation of surface bed.
 - b) Laying of low voltage power cables and earth conductors and testing of cables and conductors.
 - c) Backfilling of layer above layer of low voltage power cables and compaction.
 - d) Backfilling to danger tape layer.
 - e) Installation of danger tape(s).
 - f) Final backfilling layer.

24.1.4 Small power and Lighting

• General

The contractor shall ensure that the design and installation is done as per the client's specifications. Functional design drawings are provided as guideline only and for tender purposes although the contractor shall take note of the equipment requirements listed in the drawing legend sheets. Best practice principles shall be followed. Once the design drawings are approved, no deviations will be allowed unless approved by the client's electrical representative.

• Lighting

All luminaires shall be SABS approved; the lighting installation based on the approved design drawings. The Lux level of all other areas not specifically mentioned shall comply with the SANS 10114-1 & 2 requirements.

• Socket outlets, light switches and isolators

All equipment shall be SABS approved and metal type units. The socket outlets in the new pump room shall consist of a socket outlet with a combination of the SANS 164-1 and SANS 164-2 outlets on one 100mm x 100mm wall box.

• Conduit and wiring channel requirements

The contractor shall be responsible for determining the conduit requirements, termination boxes, routes and layouts in conjunction with the civil, mechanical and other relevant contractors prior to commencement of construction. All conduits and termination boxes shall be SABS approved and of the metal type.

Wiring channel routes and support systems to be verified on site with civil contractor. The contractor shall ensure that the quality requirements as specified on the drawing legend sheets off all equipment are adhered to. No Norse or Surfix cabling shall be accepted

- The contractor shall provide all maintenance manuals, guarantees, warrantees and relevant documentation for all equipment installed including manufacturers assembly certification for the distribution board.
- The contractor shall provide for an electrical certificate of compliance for the installation. The contractor shall inform the client's electrical engineer when this test will be conducted as he needs to witness the test. The COC will be deemed invalid if no client's electrical representative is present during the test.
- The contractor shall provide engraved labels on all equipment and outlets. No sticker type labels shall be accepted. The details of the wording will be confirmed on site with the client's electrical engineer. The contractor shall provide a laminated legend sheet inside the small power and lighting DB.
- Lightning protection
The contractor shall perform the relevant soil test and based on the test results, shall design, deliver, install, test and commission a complete lightning protection system for the new building using hard drawn galvanized rods and associated equipment. The contractor shall provide detailed reports, Auto Cad drawings and all relevant documentation for the installation.

24.1.5 Earthing System

- **All the earth cables/wires should be the same size as the power cable.**
- An earthing contractor shall design, supply and install a lightning protection and earthing system for the entire installed system, as per the Sentech earthing specification.
- The contractor shall perform the required risk assessments to determine the requirement for a lightning protection system for equipment and personnel for each part of the installation. A design for the lightning protection system with accordance to SANS 62305 set of standards and SANS 10313:2010 shall be carried out where required.
- The contractor shall carry out soil resistivity tests where required on the site. As per the above mentioned, all other relevant standards and the soil resistivity tests the contractor shall design, supply, install and commission the installation.
- The contractor shall issue the necessary documentation and test certificates to confirm the installation is compliant and issue the maintenance procedure to maintain the integrity and reliability of the system.
- Equipotential bonding is a requirement for all installed electrical power installations. The contractor shall create equipotential on which equipment (electrical and electronic) can operate and be safely interconnected avoiding differential voltages according to SANS 62305-3.
- Bonding shall intentionally connect all exposed metallic (current carrying and non-current carrying). Even if a failure of electrical insulation occurs, all bonded metal objects in the plant shall have substantially the same electrical potential, personnel and sensitive equipment shall be safe from dangerous potentials.
- The Contractor shall connect all electrical equipment e.g. distribution boards, fittings, cable racking, etc. to the earthing system as applicable.
- The surge arrestors in the distribution boards shall be connected to the earthing system.
- The Contractor shall carry out earth resistivity surveys and actual earth system measurements at the existing earth system to determine if this specification is met, including interconnection between existing earthing system and new earthing system.
- If defects are found the Contractor shall prepare an earth electrode design and supply and install such an electrode system to bring the earth resistance within specification as per SANS and IEEE standards.

24.1.6 As built Drawings and Maintenance Manuals

- To ensure returnable documentation and as built drawings of the highest standard, The contractor shall produce as-built drawings and maintenance manuals for approval. Details of all electrical equipment supplied under this contract shall appear in the manuals.
- The as built or workshop drawings and information shall be supplied by the Contractor for approval by the Engineer within the required time period specified elsewhere in the contract documents, but before manufacture of the plant equipment commences and after approval these drawings shall be supplied as final drawings.
- The client shall provide a panel of contractors used to manufacture the distribution board to guarantee consistent manufacturing standards nationwide.
- Earthing and lightning protection installation results and certificates
- Approved “as built” schematic diagrams of all circuits of all equipment in hard and electronic copy (Autocad dwg format) approved by an ECSA registered Professional Engineer
- Approved configuration and settings for all programmable equipment with hard copies approved by an ECSA registered Professional Engineer.
- Detailed operating and maintenance instructions for all equipment and systems
- The Certificate of Completion will not be issued until all the drawings, and information have been received.

24.1.7 Applicable Electrical Standards and Specification

The design and electrical installation shall adhere to the following standards and related codes of practice.

TABLE 1: GENERAL

No	Standard No	Description
1	SANS 1019	Standard voltages, currents and insulation levels for electricity supply
2	SANS IEC 60529	Degrees of protection provided by enclosures (IP code)
3	SANS 60050	International Electro technical vocabulary. Chapter 441: Switchgear, control gear and fuses
4	SABS ISO 9001, Parts I, II and III.	Quality systems
5	SANS 1091	National colour standard for paint
6	BS 4190	Specification for ISO metric black hexagon bolts, screws and nuts
7	OHS Act	Occupational Health and Safety Act (Act 85 Of 1993)
8	SANS 60909-1	Short-Circuit Currents In Three-Phase A.C. Systems Part 1: Factors For The Calculation Of Short-Circuit Currents According To IEC 60909-0 Use With: SANS 60909-0

No	Standard No	Description
9	SANS 60909-3	Short-Circuit Currents In Three-Phase A.C. Systems Part 3: Currents During Two Separate Simultaneous Line-To-Earth Short Circuits And Partial Short-Circuit Currents Flowing Through Earth Use With: SANS 60909-0
10	SANS 60909-2	Short-Circuit Currents In Three-Phase A.C. Systems Part 2: Data Of Electrical Equipment For Short- Circuit Current Calculations Use With: SANS 60909-0
11	SANS 10142-1	The wiring of premises Part 1: Low-voltage installations
12	SANS 10142-2	The wiring of premises Part 2: Medium-voltage installations above 1 kV a.c. not exceeding 22 kV a.c. and up to and including 3 000 kW installed capacity
13	SANS 10139	Fire installation

TABLE 2: CABLES AND CABLE INSTALLATION (LV, MV & EARTHING)

No	Standard No	Description
1	SANS 97	Electric cables - Impregnated paper-insulated metal-sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV (excluding pressure assisted cables)
2	SANS 1339	Electric cables - Cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV
3	SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V)
4	SANS 1507-1	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) Part 1: General
5	SABS 1507-2	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) Part 2: Wiring cables
6	SANS 1507-3	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) Part 3: PVC distribution cables
7	SANS 1507-4	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) Part 4: XLPE cables
8	SANS 1507-5	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1900/3300 V) Part 5: Halogen free distribution cables

TABLE 3: LOW VOLTAGE SWITCHGEAR

No	Standard No	Description
1	SANS IEC 60439- 1	Low voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies
2	SANS IEC 60439- 2	Low voltage switchgear and controlgear assemblies Part 2: Particular requirements for busbar trunking systems (busways)
3	SANS IEC 60439- 3	Low voltage switchgear and controlgear assemblies Part 3: Particular requirements for low voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access to their use- Distribution boards
4	SANS IEC 60439- 4	Low voltage switchgear and controlgear assemblies Part 4: Particular requirements for assemblies for construction sites (ACS)
5	SANS IEC 60439- 5	Low voltage switchgear and controlgear assemblies Part 5: Particular requirements for assemblies intended to be installed outdoors in public places- Cable distribution cabinets (CDC's) for power distribution in networks
6	BS 5486-12	Low-voltage switchgear and controlgear assemblies. Specification for particular requirements of type tested miniature circuit- breaker boards
7	SANS IEC 60947-1	Low Voltage Switchgear and Control Gear Part 1: General Rules
8	SANS IEC 60947-2	Low Voltage Switchgear and Control Gear Part 2: Circuit Breakers
9	SANS IEC 60947-3	Low Voltage Switchgear and Control Gear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
10	SANS IEC 60947-4-1	Low Voltage Switchgear and Control Gear Part 4: Contactors and motor-starters Section 1: Electromechanical contactors and motor-starters
11	SANS IEC 60947-4-2	Low Voltage Switchgear and Control Gear Part 4: Contactors and motor-starters Section 2: A C semiconductor motor controllers and starters
12	SANS IEC 60947-4-3	Low Voltage Switchgear and Control Gear Part 4: Contactors and motor-starters Section 3: A C semiconductor controllers and contactors for non motor starters
13	SANS IEC 60947-5-1	Low Voltage Switchgear and Control Gear Part 5: Control Circuit devices and switching elements- Electromechanical control circuit devices
14	SABS 763	Hot dip (galvanized) zinc coating
15	SABS 1473-1	Low-voltage switchgear and controlgear assemblies Part 1: Type-tested and partially type-tested assemblies

No	Standard No	Description
16	SABS 1473-2	Low-voltage switchgear and controlgear assemblies Part 2: Busbar trunking systems
17	SABS 1973-3	Safety of assemblies with a rated prospective short-circuit current of up to and including 10 kA
18	SANS 1973-1	Low-Voltage Switchgear And Control Gear ASSEMBLIES Part 1: Type-Tested ASSEMBLIES With Stated Deviations And A Rated Short-Circuit Withstand Strength Above 10 kA Use with: SANS 60439-1
19	SANS 1973-3	Low-Voltage Switchgear And Control Gear ASSEMBLIES Part 3: Safety Of ASSEMBLIES With A Rated Prospective Short-Circuit Current Of Up To And Including 10 kA
20	SANS 1973-7	Low-Voltage Switchgear And Control Gear ASSEMBLIES Part 7: Requirements For Testing Under Conditions Of Arcing Due To Internal Fault Use with: SANS 60439-1

TABLE 4: CIRCUIT BREAKERS & EARTH LEAKAGE PROTECTION

No	Standard No	Description
1	VC 8035	Compulsory Specification for Earth Leakage Units
2	VC 8036	Compulsory Specification for Circuit Breakers
3	SANS 156	Moulded-case Circuit-Breakers
4	SANS 767-1	Earth leakage protection units Part 1: Fixed earth leakage protection circuit-breakers
5	SANS 767-2	Earth leakage protection units Part 1: Single phase, portable units

TABLE 5: SURGE ARRESTORS AND PROTECTION

No	Standard No	Description
1	SANS 60099-4	Surge Arresters Part 4: Metal-Oxide Surge Arresters Without Gaps For A.C. Systems
2	SANS 61643-1	Low-voltage surge protective devices Part 1: Surge protective devices connected to low-voltage power distribution systems - Requirements and tests
3	SANS 61643-11	Low-voltage surge protective devices Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods

No	Standard No	Description
4	SANS 61643-12	Low-voltage surge protective devices Part 12: Surge protective devices connected to low-voltage power distribution systems - Selection and application principles
5	SANS 61643-21	Low voltage surge protective devices Part 21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods
6	SANS 61643-22	Low-voltage surge protective devices Part 22: Surge protective devices connected to telecommunications and signaling networks - Selection and application principles
7	SANS 61643-321	Components for low-voltage surge protective devices Part 321: Specification for avalanche breakdown diode (ABD)
8	SANS 61643-341	Components for low-voltage surge protective devices Part 341: Specification for thyristor surge suppressors (TSS)
9	SANS 60099-1	Surge Arresters Part 1: Non-Linear Resistor Type Gapped Surge Arresters For A.C Systems
	SANS 60099-5	Surge arresters Part 5: Selection and application recommendations

TABLE 6: EARTHING

No	Standard No	Description
1	SANS 10200	Neutral earthing in medium voltage industrial power systems
2	SANS 0292	Earthing of low-voltage (LV) distribution systems
3	SANS 0199	The design and installation of an earth electrode
4	SANS 1063	Earth rods and couplers

TABLE 7: LIGHTNING PROTECTION

No	Standard No	Description
1	NRS 042	Guide for the protection of electronic equipment against damaging transients - For applications in the electricity supply industry
2	SANS 10313	The protection of structures against lightning
3	SANS 62305-1	Protection against lightning Part 1- General principles
4	SANS 62305-2	Protection against lightning Part 2-Risk Management
5	SANS 62305-3	Protection against lightning Part 3-Physical damage to structures and life hazard

No	Standard No	Description
6	SANS 62305-4	Protection against lightning Part 4-Electrical and electronic systems within structures
7	SANS 61312-1	Protection against lightning electromagnetic impulse Part 1: General principles
8	SANS 61312-2	Protection against lightning electromagnetic impulse (LEMP) Part 2: Shielding of structures, bonding inside structures and earthing
9	SANS 61312-4	Protection against lightning electromagnetic impulse Part 4: Protection of equipment in existing structures
10	SANS IEC 61662	Assessment of the risk of damage due to lightning

TABLE 8: LIGHTING

No	Standard No	Description
1	SANS 0114-1	Interior lighting Part 1: Artificial lighting of interiors
2	SANS 0114-2	Interior lighting Part 2: Emergency lighting

TABLE 9: BUILDING ELECTRICAL INSTALLATIONS

No	Standard No	Description
1	SANS 10142-1	The wiring of premises Part 1: Low-voltage installations
2	SANS 1239	Plugs, socket outlets and couplers for industrial purposes

Should the contractor require temporary lighting, it shall be the contractor's responsibility to organize temporary lighting with the electrical contractor.

All control equipment and serviceable items shall be installed and positioned such that they will be accessible and maintainable.

25 CIVIL ENGINEERING – STANDARD AND TECHNICAL SPECIFICATION

SCOPE OF WORK

These Project Specifications are set out in two portions. Portion 1 covers the general description of the project, the facilities available and the requirements to be met. Portion 2 covers variations and additions to the SANS 1200 Standardised Specifications that are applicable to this Contract.

STATUS

In the event of any discrepancy between the Project Specifications and a part or parts of the SANS 1200 Standardised Specifications, the Schedule of Quantities or the Drawings, the Project Specifications shall take precedence.

PORTION 1: THE WORKS

PS APPLICABLE STANDARDISED SPECIFICATIONS

Portion 1: The Works

PS 1	General Description of Works
PS 2	Description of Site and Access
PS 3	Nature of Ground and Sub-soil Conditions
PS 4	Details of Contract
PS 5	Construction Programme
PS 6	Site Facilities Available
PS 7	Site Facilities Required
PS 8	Features Requiring Special Attention
PS 9	Preservation of the Site
PS 10	Key Personnel
PS 11	Safety Personnel
PS 12	Site Meetings
PS 13	Notices to the Engineer
PS 14	Use of defective Works
PS 15	SABS 1200 Series Standardized Specifications
PS 16	Prime cost items and Provisional sums

For the purposes of this Contract, the following SANS 1200 Standardised Specifications shall apply:

SANS 1200 A	:	General (1986)
SANS 1200 C	:	Site clearance (1982)
SANS 1200 D	:	Earthworks (1990)
SANS 1200 DB	:	Earthworks (pipe trenches) (1989)
SANS 1200 L	:	Medium-pressure pipelines (1983)
SANS 1200 LB	:	Bedding (pipes) (1983)
SANS 1200 LD	:	Sewers (1982)
SANS 1200 LE	:	Stormwater drainage (1982)
SANS 1200 PA	:	Fencing (1984)

Variations and additions to the following SANS 1200 Standardised Specifications are given in **Portion 2** of the Project Specifications:

SANS 1200 A	:	General
SANS 1200 C	:	Site clearance
SANS 1200 D	:	Earthworks
SANS 1200 DB	:	Earthworks (pipe trenches)
SANS 1200 G	:	Concrete (structural)

SANS 1200 H	:	Structural Steel
SANS 1200 HB	:	Cladding and sheeting
SANS 1200 L	:	Medium-pressure pipelines
SANS 1200 LB	:	Bedding (pipes)
SANS 1200 LD	:	Sewers
SANS 1200 LE	:	Stormwater drainage

PORTION 1: THE WORKS

PS1 GENERAL DESCRIPTION OF WORKS

This contract comprises of the construction of a Pump Station including the supply, delivery, installation, testing, commissioning and handing over of the pumps.

The Contractor's obligations under Contract comprise the construction, completion and maintenance of the Works. The provision of all labour, materials, construction plant, temporary works and everything, whether of a temporary or permanent nature required in and for such construction, completion and maintenance so far as the necessity for providing the same is specified in or reasonably to be inferred in the Contract.

PS2 DESCRIPTION OF SITE AND ACCESS

The Site of the Works is on Sentech premises in Radiokop, Johannesburg.

PS3 NATURE OF GROUND AND SUBSOIL CONDITIONS

No geotechnical report will be provided to the Contractor. It is the Contractor's responsibility in terms of the General Conditions of Contract, to satisfy himself as to the conditions on the site and the possible variation thereto due to seasonal effects.

PS4 DETAILS OF CONTRACT

- Construction of the pump station.
- Construction of the main reticulation line.
- Optimization of the electrical and mechanical equipment.

PS 5 CONSTRUCTION PROGRAMME

PS 5.1 Time for Completion

Time is of the essence for this contract. The works shall be completed in a period of communicated by the client, Sentech.

PS 5.2 Bidder's Programme

The Bidder shall attach a preliminary programme indicating each portion of the works. The proposed order and rate of progress of the various construction activities shall be consistent with, and in support of, his time required for completion and measured against recorded deliverables.

PS 5.3 Contractor's Programme

After award of the Contract, the Contractor shall submit a detailed programme to the Engineer for approval. The Engineer may from time to time during the contract, require this programme to be amended in the interest of the project, and such amended and approved programme shall be adhered to rigidly.

PS 6 SITE FACILITIES AVAILABLE**PS 6.1 Water and Electricity Supply**

The Contractor shall make his own arrangements for the supply and distribution of water and power.

PS 6.2 Location of Contractor's Camp and Depots

The Employer, in conjunction with the Engineer, will allocate a suitable area to the Contractors for the erection of temporary site offices and for storing materials.

PS 6.3 Sources of Construction Materials

If the existing material is not of the required standard, suitable material will be imported from an approved commercial source. All construction material must be found, selected and supplied by the Contractor him/herself and approved by the Engineer.

PS 7 SITE FACILITIES REQUIRED

No existing facilities are available. All the necessary site facilities shall be provided and maintained by the Contractor. The requirements regarding notice boards, laboratories, accommodation and survey equipment for use by the Engineer. etc. are set out in sections PSA and PSAB of the project specification.

PS 7.1 Temporary Offices and Storage Sheds

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. An office approximately 4m x 5m in size with a desk and 10 chairs is to be provided for the purpose of holding site meetings.

PS 7.2 Laboratory Facilities

No laboratory, testing or storage facilities are available from the Employer. The Contractor must make his own arrangements and provide all facilities which must be acceptable to the Engineer for all testing required. Refer also to Clause PSA 4.1

PS 7.3 Sanitary Facilities

No separate sanitation facilities for the specific use of the Engineer or his staff need be provided. The Contractor shall provide and maintain adequate and approved temporary ablution and latrine facilities for his workmen on site and remove on completion.

PS 7.4 Telephone Facilities

No telephone facilities are available from the Employer. The Contractor is advised to establish his/her own communication facilities from the site to his/her outside organizations.

PS 7.5 Accommodations for the Engineer

A separate office is required for the specific use of the Engineer.

PS 8 FEATURES REQUIRING SPECIAL ATTENTION**PS 8.1 Existing Services**

There is little data on the existing services; neither the Employer nor the Engineer will accept the responsibility for the accuracy or for any omission that may have been made.

The Contractor shall take all reasonable steps to protect any existing works against damage which may arise as a result of his operations on the site. The Contractor shall acquaint himself with all existing works. Before any excavation is commenced the Contractor shall submit to the owners of such works plans showing the extent of the proposed excavations together with a programme giving approximate dates on which excavations will be commenced, and shall where possible, obtain from the owners plans showing the position of all existing works.

Where the Contractor anticipates that it will be virtually impossible for him/her to carry out the work without causing damage to existing services or works, and the Engineer in his discretion feels such damage is likely to occur, the Contractor shall make arrangements with the authority concerned to temporarily remove, deviate, protect or suspend the work or service concerned and pay the costs incurred, which shall be reimbursed to the Contractor.

The Contractor shall be responsible for the proper consolidation of the ground under and around any exposed mains, cables, valves, stopcock boxes and the like. The uncovering of boxes and covers that may become buried during excavation or refilling operation will be at the expense of the Contractor.

When crossing under or running parallel to poles supporting electrical services, they shall be sustained securely in place until the work is complete and shall then be made safe as before.

Where any existing services are crossed or temporarily removed, the Contractor shall be responsible for the repair and/or reinstatement of the crossings to the satisfaction of the owners and the Engineer's Representative.

The Contractor shall be held responsible for damage to any existing works and any damage caused, including any claims, which arise as a result thereof. All such claims shall be borne by the Contractor, unless it is established by the Engineer that the Contractor exercised reasonable care and damage was unavoidable and that the notices were served timeously.

All damage done to existing works shall be immediately notified to the owners concerned and to the Engineer. If so directed by the Engineer, the positions of any existing work shall be changed by the Contractor to meet the requirements of the proposed work and the cost of such changes will be paid for as extra works.

PS 9 PRESERVATION OF THE SITE

The Contractor shall not start any fires and naked flames/smoking is strictly prohibited.

The Contractor shall not permit the destruction of or injury to, animals or bird life within the site of the works during the period of the contract.

During the progress of the work and at the completion thereof the site is to be kept, and left, in a clean and orderly condition to the satisfaction of the Engineer.

The Contractor shall at all times store materials and equipment for which he is responsible in an orderly manner and shall keep the premises free from debris and obstruction.

Only trees marked and indicated by the Engineer may be removed.

Existing graves are to be identified and protected from damage arising out of construction activities.

PS 10 KEY PERSONNEL

The Contractor shall furnish the Engineer with a list of addresses and telephone numbers of key personnel in the Contractor's organization who may be contacted in an emergency both during and outside office hours.

PS 11 SAFETY OF WORKMEN

The safe conduct of the Works shall be a primary consideration and the entire Works (until completion or termination of the contract) shall be carried out in conformity with the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and all other applicable statutory regulations and requirements. Bidders must price their Bids accordingly.

Particular attention is drawn to the following:

- a) If the Contractor has more than 20 employees, a health and safety representative (or

- representatives) must be designated.
- b) The Contractor is responsible for the compliance with the Act by all his/her subcontractors, whether nominated and/or approved by the Employer.
 - c) The Contractor accepts sole responsibility for compliance with the relevant duties, obligations and prohibitions by the Act, and expressly absolved the Employer and the Employer's consulting engineers of responsibility for compliance with the Act in respect of work included in the contract
 - d) The Contractor shall be obliged to report forthwith to the Employer any investigation, complaint or criminal charge which may arise because of the provisions of the Act pursuant to work performed on behalf of the Employer.
 - e) The Contractor shall provide and maintain in readiness on the Site, all equipment and materials necessary to render first aid in case of accidents or other emergencies. The Contractor shall also assign to the Works and designate for this purpose, trained employees who are able to render first aid.

PS 12 SITE MEETINGS

The Engineer shall hold regular site meetings and keep and circulate minutes. The Contractor shall attend and shall ensure that all sub-contractors are represented when required by the Engineer.

PS 13 NOTICES TO THE ENGINEER

Apart from the specific notice periods called for in the Contract Documents, the Contractor shall give the Engineer forty eight (48) hours' notice of any work requiring inspection by the Engineer. No further subsequent work dependent on such approval may be undertaken until confirmation of such receipt by the Engineer has been received.

PS 14 USES OF DEFECTIVE WORKS

Should any of the works be found to be not in accordance with the Contract, the Client shall have the right to use such defective works until the Contractor shall have rectified the defect or replaced the defective works with works complying with the Contract, without prejudice to any of the Client's rights under the Contract and without incurring any obligation in respect of the use of the defective works.

PS 15 SABS 1200 SERIES STANDARDIZED SPECIFICATIONS

The Contractor shall provide on-site a copy of the relevant sections of both SANS 1200 Series Standardized Specification and the related 0120 Code of Practice.

PS 16 PRIME COST ITEMS AND PROVISIONAL SUMS

In cases of any provisional sum set out in the Schedule of Quantities for work which has not been specified or scheduled in detail when the contract is entered into, where work to which the provisional sum relates has been ordered by the Engineer and such work is: -

- a) Executed by the Contractor, it shall be valued in accordance with Clause 6.4 of the General Conditions of Contract,
- b) Executed by a Sub-Contractor, the Contractor shall be reimbursed the sum or sums he actually paid to the Sub-Contractor plus either:-
 - i) A commission of 7,5% (seven- and one-half percent) on the sum or sums actually paid to the Sub-Contractor, irrespective of by whom payment is made to the Sub-Contractor, or
 - ii) If the Contractor shall have added to the provisional sum in question, a sum in respect of charges and profits, a sum in the same proportion to the amount paid to the provisional sum.

Where sums are stated in the Schedule of Quantities to be provided to cover the prime cost (P.C.) for goods or materials to be supplied under the Contract, the amount to therefore be

paid to the Contractor shall be the actual price paid by him in substitution for the prime cost sum, together with any charge included by the Contractor in his Bid for labour, profit, carriage, establishment and other charges.

When required by the Engineer, the Contractor shall produce all invoices, vouchers and receipts in respect of payments made by him in connection with provisional or prime cost items.

PORTION 2: VARIATIONS FROM STANDARD SPECIFICATIONS

PSC 2 CONSTRUCTION

PSD SABS 1200 D: EARTHWORKS

PSD 3 MATERIALS

PSD 3.1 Classification for Excavation Purposes

Classification of material other than soft shall be agreed upon prior to excavation commencing. The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated warrants a new classification. Failure on the part of the Contractor to notify the Engineer timeously shall entitle the Engineer to classify the material at his discretion.

PSD 5 CONSTRUCTION

PSD 5.2 Methods and Procedures

PSD 5.2.2.4 Selection and Stockpiling

The Contractor shall select suitable material from the excavated and stockpiled materials for which use it is intended, disregard unsuitable material and reserve material for other purposes as necessary. When required and as ordered by the Engineer, material shall be stockpiled for later use when excavation thereof is unavoidable in order to excavate the material required at the time.

PSD 5.2.5.1 Free-haul

All haul within the site of works or within a distance of 2,0 km outside the of the boundaries of the Contract as indicated on the drawings shall be regarded as free-haul.

PSD 8 MEASUREMENT AND PAYMENT

PSD 8.1 Basic Principles

Further to the requirements of Clause 8.1, no allowances will be made for bulking and/or shrinkage. It shall be assumed that 1 cubic metre of excavated material from the site shall form 1 cubic metre of compacted fill. Measurements for bulk earthworks shall be from topographical survey and DTM modelling. No extra or separate payment will be made for work considered to be of a restricted nature.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB 3 MATERIALS

PSDB 3.5 BACKFILL MATERIALS

- **Cement-stabilized backfilling:**
Backfilling shall, where directed by the Engineer, be stabilized with 5% cement. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.
The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density.
- **Soilcrete backfilling:**
The aggregate for soilcrete shall be mixed with 5% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.
The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to acquire a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary.

PSDB 5 CONSTRUCTION

PSDB 5.1 PRECAUTIONS

PSDB 5.1.3 Accommodation of traffic and access to properties

Where necessary to achieve compliance by the Contractor with his obligations in terms of subclause PS 8.5 of Portion 1 of the Project Specifications to provide and maintain pedestrian and vehicular access to properties affected by the works, the Contractor shall construct and maintain to the satisfaction of the Engineer, such temporary access roads around, and/or steel or timber bridges over excavations in roads, pavements, entrances or accesses to properties.

Temporary pedestrian access bridges shall be at least 1,2 m wide and temporary access bridges for vehicles shall be at least 3,6 m wide. All temporary access bridges shall be fitted with handrails as well as protective mesh fencing on both sides.

On completion of the work, the Contractor shall dismantle and remove all such temporary constructions and reinstate these areas to their former condition.

Except only where the Engineer has included in the Schedule of Quantities, particular payment items specifically therefor, the Contractor will not be paid directly for the construction and maintenance of temporary access roads and/or the provision and maintenance of bridges as aforementioned, and the costs thereof shall be deemed included in the Contractor's tendered rates for excavation.

PSDB 5.2 MINIMUM BASE WIDTHS

The specified width of trenches and the width of the excavation measured for payment shall not be less than 0,5 m, but the Contractor may reduce the actual width with the Engineer's permission.

"Except where otherwise specified, trenches shall be of such a depth that the minimum cover over the pipes shall be 800 mm except at road-crossings where the minimum cover shall be 1 000 mm."

PSDB 5.6 BACKFILL

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.3 SCHEDULED ITEMS

PSDB 8.3.2 Excavation

- (a) Excavate in all materials, for trenches, backfill compact and dispose of surplus material

REPLACE "of 1,0 m" IN THE FIRST SENTENCE OF 8.3.2(a) WITH:

"as specified in the Tender Drawings."

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

"No payments will be made under subitems (1) and (2) in respect of any materials measured and paid for under subitem 3 below."

Hand excavation were ordered by the Engineer in:

- (a) Soft material Unit: m³
- (b) Intermediate material Unit: m³
- (c) Hard material Unit: m³

The unit of measurement shall be the cubic metre of material, measured in place according to the authorised dimensions, which was excavated by hand on the specific prior written instructions of the Engineer; provided always that the Engineer's said instruction shall have stated that measurement and payment for such hand excavation will be in accordance with this item.

The tendered rate shall include full compensation for the additional cost, effort and time resulting from excavating in the respective materials using hand methods only.

The Engineer shall not be obliged to authorise payment under this item in respect of any hand excavation carried out (whether ordered in writing or otherwise), which hand excavation was in any case necessary to achieve compliance by the Contractor with his obligations under the Contract to

- (i) utilise construction appropriate to the nature of the specific parts of the works; and/or
- (ii) protect existing structures and/or services; and/or
- (iii) comply with all prevailing legislation and regulations.

- (4) Backfill stabilized with 5% cement were directed

by the Engineer Unit: m³

The unit of measurement shall be the cubic metre of backfill material, measured in place after compaction according to the authorised dimensions, which was stabilized on the Engineer's instructions in accordance with subclause PSDB 3.5(c).

The tendered rate shall include full compensation for supplying the cement and for selecting, mixing, backfilling and compacting the stabilized material to 90% of modified AASHTO density.

- (5) Soilcrete backfill where directed by the Engineer Unit: m³

The unit of measurement shall be the cubic metre of soilcrete placed on the Engineer's instructions in accordance with subclause PSDB 3.5(d), measured in place according to the authorised dimensions.

The tendered rate shall include full compensation for supplying the cement and for selecting, mixing and placing the soilcrete as well as for the cost of shuttering if required."

- "(d) Excavate in all materials for stormwater inlet and outlet structures and for manholes, catchpits, valve chambers and the like, irrespective of depth, and backfill around structures: Unit: m³

The unit of measurement shall be the cubic metre of material excavated, measured in place according to the authorised dimensions, and excluding the volume of material excavated and paid for under subitem (a).

The tendered rate shall include for the costs of excavating in all materials, backfilling, compacting, trimming and tidying the final surface around the structure, disposing of surplus and unsuitable materials within the free-haul distance and, where applicable, selecting and keeping separate, excavated material suitable for use as backfill.

- (e) Excavate open drains in all materials Unit: m³

The tendered rates shall include full compensation for excavating in all materials within the dimensions specified or authorised by the Engineer and to the specified lines and profiles, for the disposal of surplus and unsuitable excavated material where applicable, and in the case of item (d), for backfilling with suitable approved material compacted to 90% of modified AASHTO density around the structures.

- (f) Extra over subitems (d) and (e) for excavating in:

- (1) Intermediate material Unit: m³

- (2) Hard rock material Unit: m³

Measurement and payment shall be in accordance with the provisions of 8.3.2(b) of SABS 1200 D (as amended)."

PSDB 8.3.3 Excavation ancillaries

PSDB 8.3.3.3 Compaction in road reserves

"PSDB 8.3.3.3 Compaction in road crossings"

"To determine the volume in the case of gravel roads, the depth will be measured from the underside of the gravel wearing course to the top of the fill blanket, and in the case of bitumen roads, from the underside of the subbase to the top of the fill blanket.

The rest of the trench shall be backfilled as specified in clauses 5.9.3, 5.9.4 and 5.9.5, as applicable, and payment will be made under item 8.3.6.1."

PSDB 8.3.7 "Accommodation of traffic Unit: sum

The tendered sum shall, (except where particular items are scheduled to cover particular costs) include full compensation for compliance with the requirements of 5.1.3 of SABS 1200 DB (as amended), including the construction and maintenance of bypasses and the use of existing roads as bypasses during the construction period.

It shall also include full compensation: for the provision, maintenance and removal of all traffic control measures, including temporary traffic signs, road markings, lighting, barricading, flagmen and, where necessary, communications equipment to regulate traffic; for the construction of temporary drainage works; for the maintenance of drainage works; and for arrangements for moving and subsequently reinstating services for the purposes of accommodating traffic, attending to traffic problems and complying with the requirements of the Road Traffic Ordinance and the relevant local authorities.

The tendered lump sum shall not be adjusted in the event of any extension of time for completion being granted by the Engineer in accordance with Clause 45 of the Conditions of Contract.

Payment shall be made in equal monthly instalments over the entire period allowed for completion, provided that where any extension of time for completion is granted, the amount which shall be payable under this item in any subsequent monthly payment certificate shall be the outstanding unpaid amount

of the lump sum, divided by the number of months remaining until the due completion date of the Contract, as revised in accordance with the Conditions of Contract."

PSL MEDIUM-PRESSURE PIPELINES

PSL 3 MATERIAL

PSL 3.7 OTHER TYPES OF PIPES

PSL 3.7.1 uPVC pipes

ADD THE FOLLOWING:

"Pipes and couplings should conform to SANS."

PSL 3.7.2 Polyethylene pipes

"Polyethylene pipes compression fittings shall be as shown the Tender drawings and shall comply with SABS 533 Part II."

"Valves shall comply with the following requirements:

- (a) They shall open/close clockwise and shall have a non-rising spindle and handwheel.
- (b) They shall be class 16 valves complying with SABS 664.
- (c) They shall comply with the requirements of SABS 1123 table 1600.

PSL 7 TESTING

PSL 7.3 STANDARD HYDRAULIC PIPE TEST

PSL 7.3.1 Test pressure and time of test

PSL 7.3.1.2 The maximum working pressure for the different pipes is indicated by the class of the pipe.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.2 SCHEDULED ITEMS

PSL 8.2.18 Connection to existing main supply

The rate shall include all the installation of any coupling required by the connection and approval thereof by the relevant Authority.

PSLB BEDDING (PIPES)

PSLB 3 MATERIALS

PSLB 3.1 SELECTED GRANULAR MATERIAL :

"Selected granular material shall have a PI not exceeding 6 and shall be free from sharp-edged particles exceeding 19 mm."

PSLB 3.2 SELECTED FILL MATERIAL

"Selected fill material used for bedding shall be stabilized with 5% cement as specified under subclause PSDB 3.5(c)."

PSLB 3.3 BEDDING

"uPVC and HDPE pipes are deemed to be flexible pipes for the purposes of this subclause."

PSLB 3.4 SELECTION

PSLB 3.4.1 Suitable material available from trench excavation

REPLACE THE WORDS "(but is not required)" IN THE FIFTH LINE WITH THE WORDS "(at his own cost)".

PSME 5 CONSTRUCTION

PSME 8 MEASUREMENT AND PAYMENT

PSME 8.1 BASIC PRINCIPLES

"(d) that, in the case of material from a commercial source or from borrow pits selected by the Contractor, no additional payment will be made for the class of excavation, method of processing (except stabilizing), or overhaul."

PSME 8.3 SCHEDULED ITEMS

PSME 8.3.2 Construct the subbase course/shoulders/gravel wearing course with material from designated excavations

"The rate for (a) shall include full compensation for excavating and selecting subbase material, for loading and transporting the material within the free-haul distance, and for either placing the material on the road or stockpiling the material for later use. When material is stockpiled, the rate shall include compensation for shaping and grading the stockpile so that it is free-draining."

PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources or designated borrow areas

"PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources"

"This item shall also apply to the construction of subbase course/shoulders/gravel wearing course with material from borrow pits selected by the Contractor."

PSME 8.3.9 Overhaul (haul exceeding 2 km):

"(a) Limited overhaul Unit: m³

(b) Long overhaul Unit: m³-km

Overhaul will be paid in accordance with item 8.3.6 of SABS 1200 D."

26 DRAWINGS REGISTER

NOTE: THESE ARE THE DRAWINGS THAT WILL BE DISPLAYED DURING BRIEFING

DRAWING NO.	TITLE	REVISION	
FIRE DRAWINGS			
ME-400-CC-FD	CANTEEN AND ENGINEERING BUILDING GROUND FLOOR FIRE DETECTION LAYOUT	D	

DRAWING NO.	TITLE	REVISION	
ME-400-CC-FP	CANTEEN AND ENGINEERING BUILDING GROUND FLOOR FIRE PROTECTION LAYOUT	C	
ME-400-TCC-FD	JHB TCC FIRE DETECTION LAYOUT	C	
ME-400-TCC-FP	JHB TCC FIRE PROTECTION LAYOUT	C	
ME-400-KUB-FD	KU BAND BUILDING FIRE DETECTION LAYOUT	C	
ME-400-KUB-FP	KU BAND BUILDING FIRE PROTECTION LAYOUT	C	
ME-400-MB-FD	MAIN BUILDING GROUND FLOOR BUILDING FIRE DETECTION LAYOUT	C	
ME-400-MB-FP	MAIN BUILDING GROUND FLOOR BUILDING FIRE PROTECTION LAYOUT	C	
ME-401-MB-FD	MAIN BUILDING FIRST FLOOR BUILDING FIRE DETECTION LAYOUT	C	
ME-401-MB-FP	MAIN BUILDING FIRST FLOOR BUILDING FIRE PROTECTION LAYOUT	C	
ME-400-SF-FD	STORES & FACILITY FIRE DETECTION LAYOUT	C	
ME-400-SF-FP	STORES & FACILITY FIRE PROTECTION LAYOUT	C	
ME-001-FP	FIRE PROTECTION SITE PLAN LAYOUT	C	
ELECTRICAL DRAWINGS			
PR00474/EL-001 SR	SITE CABLE RETICULATION LAYOUT	B	
PR00474/EL-800-SLD	PUMP ROOM SINGLE LINE DIAGRAM	B	
PR00474-EL-400-LSP	PUMP HOUSE LIGHTING AND SMALL POWER LAYOUT	A	
PR00474-EL-800-DBGA	PUMP HOUSE DB GENERAL ARRANGEMENT LAYOUT	A	
CIVIL DRAWINGS			
PR00474/CE-400-PH	FOUNDATION LAYOUT	B	
PR00474/CE-401-PH	STRIP FOOTING DETAILS	B	
PR00474/CE-402-PH	ELEVATION DETAILS	B	
PR00474/CE-800-PB	PIPELINE BEDDING DETAILS	A	

27 OHS Requirements

The client Sentech will issue at a later stage a safety file plan/requirements (file spec) or specification to be followed by the contractor as an annexure to develop the file for evaluation by the client's OHS department. This document will be compiled by contractor upon their appointment.

28 CONCLUSION

Prior to any future alterations or changes in occupancy, the building must be reassessed. Fire safety systems and equipment must always be kept in good working order. Faulty systems and equipment must be repaired as soon as possible. The fire protection requirements for a safe building will be met as per our report.