



KOUGA MUNICIPALITY

UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

CONTRACT NO: 115/2026

APRIL 2026

SERVICE PROVIDER		
TELEPHONE / FACSIMILE		
CLOSING DATE	01 June 2026 @ 12:00	

ISSUED BY:

Kouga Local Municipality

Physical Address:
33 Da Gama Road
Jeffreys Bay

Postal Address:
P O Box 21
Jeffrey Bay
6330

PREPARED BY:

AfriCoast Consulting Engineers (Pty) Ltd

Postal Address:
P O Box 5104
Walmer
6065

KOUGA LOCAL MUNICIPALITY

BID No.: 115/2026

UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

GENERAL TENDER INFORMATION

TENDERS INVITED	:	30 April 2026
ESTIMATED CIDB CONTRACTOR GRADING	:	5CE or higher
CLARIFICATION MEETING	:	A compulsory virtual clarification meeting to be held on 18 May 2026 at 10h00
VENUE FOR SITE VISIT/CLARIFICATION MEETING	:	Virtual on-line clarification meeting
CLOSING DATE	:	01 June 2026
CLOSING TIME	:	12:00:00 PM / 12h00
CLOSING VENUE	:	Tender Box at the Municipal Office, Room 122 16 Woltemade Street (front)
VALIDITY PERIOD OF TENDER	:	90 days
TENDER BOX	:	The Tender Documents (which includes the Form of Offer and Acceptance) completed in all respects, plus any additional supporting documentation required, must be submitted in a sealed envelope with the name and address of the tenderer, the tender No. and title and the closing date indicated on the envelope. The sealed envelope must be inserted into the appropriate official tender box before closing time. The onus remains with the tenderer to ensure that the tender is placed in the correct tender box.

KOUGA LOCAL MUNICIPALITY

BID No.: 115/2026

UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

PARTICULARS OF BIDDER

Name of Bidder	
Contact Person:	
Postal Address	
Street Address	
Telephone Number	Code: Number:
Cell phone Number	
Facsimile Number	Code: Number:
E-Mail Address	
CSD Supplier Number (National Treasury)	
CIDB CRS Number	
Vat Registration Number	

CONTENTS

SECTION	DESCRIPTION	PAGE NUMBER(S)
<u>THE TENDER</u>		
PART 1	TENDERING PROCEDURES	5
T1.1	Tender Notice and Invitation to Tender	6
T1.2	Tender Data	8
PART 2	RETURNABLE DOCUMENTS	28
T2.1	List of Returnable Documents	29
T2.2	Returnable Schedules	30
<u>THE CONTRACT</u>		
PART 1	AGREEMENT AND CONTRACT DATA	75
C1.1	Form of Offer and Acceptance	76
C1.2	Contract Data	82
C1.3	Form of Guarantee	94
C1.4	Health and Safety Agreement	97
C1.5	Disclosure Statement	100
C1.6	Adjudication Board Member Agreement	101
PART 2	PRICING DATA	104
C2.1	Pricing Instructions	105
C2.2	Bill of Quantities	107
C2.3	Summary Page for Bill of Quantities	139
PART 3	SCOPE OF WORK	140
C3.1	Description of the Works	141
C3.2	Engineering	144
C3.3	Procurement	147
C3.4	Construction	151
C3.5	Management	318
PART 4	SITE INFORMATION	323
C4.1	Scope	324
C4.2	Subsoil conditions	324
C4.3	Finishing-off of the site	324
<u>APPENDICES</u>		
APPENDIX A	Health & Safety Specification	325
APPENDIX B	Tender Drawings	326

TENDER

PART 1 (OF 2): TENDERING PROCEDURES

T1.1 Tender Notice and Invitation to Tender

T1.2 Tender Data

T1.1: TENDER NOTICE AND INVITATION TO TENDER

KOUGA LOCAL MUNICIPALITY (EC108)
DIRECTORATE: WATER AND CIVIL SERVICES
NOTICE NO: 115/2026

UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

Prospective Service Providers are hereby invited to submit tenders for the upgrade of the Phillipsville sports facility in Hankey.

Tenders

An electronic copy of the tender document will be available on E-Tender portal www.etender.gov.za or the municipal website www.kouga.gov.za as from **Thursday, 30 April 2026**. After downloading the tender document from the website each prospective bidder, **MUST** email their contact details to tenders@kouga.gov.za and copied to infrastructuretenders@kouga.gov.za.

A **Compulsory Virtual Clarification Session** will be arranged for **Monday, 18 May 2026 @10h00am**. Prospective bidders can use link below which is direct from this advert to access the meeting. **Please take note that no attendee arriving 10 minutes late or more** will be allowed to attend the clarification meeting.

Join Teams Meeting

<https://teams.microsoft.com/meet/329674584049782?p=2POsoqDSsJzYCnWxQX>

Meeting ID: 329 674 584 049 782

Passcode: 7Ed9xM9x

Please note:

- Telegraphic, telephonic, telex, facsimile, email, or late tenders will not be accepted.
- This contract will be evaluated on the 80/20-point system. 80 points for price and 20 points for specific goals. To claim points for specific goals prospective bidders **MUST** submit proof/ required documents.
- **An electronic copy of the completed tender document with returnable documents must be submitted with tender submission saved in a flash drive or CD. Failure to submit AN ORIGINAL HARD COPY AND A COPY ON EITHER USB or CD will deem the bid non-responsive.**
- **Bidders must note that the Municipality may make use of additional vetting methods to further qualify capacity of bidders to eliminate delays during project implementation.**
- An estimated contractor CIDB Grading of 5CE or higher is required.
- **A minimum functional assessment score of 70% will apply to this contract.**
- A valid Tax compliance Status pin must be submitted.
- Prospective Service Providers must register on Kouga Municipality's Supplier database as per the registration requirements.
- The National Treasury Central Supplier Database Summary report must be submitted.
- The Council reserves the right to accept any tender and, or part thereof, appoint more than one contractor, and does not bind itself to accept the lowest or any tender. The Council reserves the right to appoint any contractor.
- The validity period for submission will be 90 days from the closing date.
- Tenders that are deposited in the incorrect box or delivered to any other venue will not be considered.

Enquiries relating to this tender must be submitted in writing via e-mail to tenders@kouga.gov.za and copied to jdutoit@kouga.gov.za.

Completed documents in a sealed envelope endorsed "**NOTICE NO: 115/2026 UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY**" Must be placed in the Tender Box at 16 Woltemade Street (front entrance), Jeffrey's Bay, Room 122 on or before **MONDAY, 01 JUNE 2026 at 12:00.**

C. DU PLESSIS
MUNICIPAL MANAGER

P.O. Box 21
JEFFREYS BAY
6330

For Placement: The Herald/Municipal Website/ Municipal Notice Boards in all offices/areas – 30 April 2026

PART A

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (NAME OF MUNICIPALITY/MUNICIPAL ENTITY)					
BID NUMBER:	115/2026	CLOSING DATE:	01 JUNE 2026	CLOSING TIME:	12h00
DESCRIPTION	UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT

KOUGA LOCAL MUNICIPALITY, 16 WOLTEMADE STREET, JEFFREYS BAY					
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		OR	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	<input type="checkbox"/> Yes <input type="checkbox"/> No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	<input type="checkbox"/> Yes <input type="checkbox"/> No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
1. ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		2. ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER PART B:3]	
3. TOTAL NUMBER OF ITEMS OFFERED			4. TOTAL BID PRICE	R	
5. SIGNATURE OF BIDDER		6. DATE		
7. CAPACITY UNDER WHICH THIS BID IS SIGNED					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:			TECHNICAL INFORMATION MAY BE DIRECTED TO:		
DEPARTMENT	Supply Chain Management		CONTACT PERSON	Miss Thando Makhwangeni	
CONTACT PERSON			TELEPHONE NUMBER	042-200-2200	
TELEPHONE NUMBER	042-200-2200		FACSIMILE NUMBER	n/a	
FACSIMILE NUMBER			E-MAIL ADDRESS	tmakhwangeni@kouga.gov.za	
E-MAIL ADDRESS	tenders@kouga.gov.za				

T1.2: TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in the CIDB Standard for Uniformity in Engineering and Construction Works Contracts as published in Board Notice 423 of 2019 of 08 August 2019 (see www.cidb.org.za).

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

“Bid” should read “tender”, and vice versa, throughout the document – implying both words have the same meaning.

Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause Tender Data Number

C.1 General

C.1.1 Actions

The Employer is **KOUGA LOCAL MUNICIPALITY**.

C.1.2 Tender Documents

Add the following:

The following documents form part of this tender:

VOLUME 3: The General Conditions of Contract for Construction Works (Third Edition) 2015 as published by the South African Institution of Civil Engineering. This publication is available, and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za.

VOLUME 4: The SANS Standard Specifications for Civil Engineering Construction prepared by Standards South Africa (SANS 1200). These publications are obtainable, and tenderers must obtain copies at their own cost from Standards South Africa, Private Bag X191, PRETORIA, 0001.

The Tender Documents issued by the Employer comprise:

VOLUME 1: The Tender Document (this document), in which are bound:

THE TENDER

Part T1: Tendering Procedures

T1.1 Tender Notice and Invitation to Tender

T1.2 Tender Data

Part T2: Returnable documents

T2.1 List of Returnable Documents

T2.2 Returnable Schedules

THE CONTRACT

Part C1: Agreements and Contract Data

C1.1 Form of Offer and Acceptance

C1.2 Contract Data

C1.3 Form of Performance Guarantee

C1.4 Occupational Health and Safety Agreement

C1.5 Protection of the Environmental Declaration

Part C2: Pricing data

C2.1 Pricing Instructions

C2.2 Bill of Quantities

Part C3: Scope of Work

C3.1 Description of the Works

C3.2 Engineering

C3.3 Procurement

C3.4 Construction

C3.5 Management

C3.6 Health and Safety Specifications

C3.7 Annexures

Part C4 : Site Information

C4.1 General Site Information

VOLUME 2: The following Tender drawings issued with this tender:

Book of Drawings – will be issued in PDF Format by a weblink (Mimecast), before the Tender Clarification Meeting, to all Tenderers who have pre-booked the Bid Document.

C.1.3 Interpretation

C.1.3.1 *Delete the clause and replace with the following:*

These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.4 Communication

Delete the first sentence of the clause and replace with the following:

Verbal or any other form of communication, from the Employer, its employees, agents, or advisors during site visits/clarification meetings or at any other time prior to the award of the Contract, will not be regarded as binding on the Employer, unless communicated by the Employer in writing to suppliers by its director: Supply Chain Management or his nominee.

The Employer's Agent, for the purposes of any communication between the Employer and Tenderer is:

Name	:	AfriCoast Consulting Engineers (Pty) Ltd
Represented By	:	Sizani Mrwetyana
Address	:	P.O Box 5104, Walmer, Gqeberha
Telephone	:	081 394 7263

C.1.5 Cancellation and Re-Invitation of Tenders

*Delete the full stop at the end of C.1.5.1 c) and replace with, or
Add the following after C.1.5.1 c):*

d) there is a material irregularity in the tender process.

C1.6 Procurement Procedures

C1.6.2 Competitive negotiation procedure

Add the following to C.1.6.2.1:

A competitive negotiation procedure will not be followed.

C.1.6.3 Proposal procedure using the two-stage system

Add the following between C.1.6.3 and C.1.6.3.1:

A two-stage system will not be followed.

Add the following after C.1.6.3.2.2

C.1.6.4 Objections, complaints, queries, and disputes/ Appeals in terms of Section 62 of the Systems Act/ Access to court

C.1.6.4.1 Disputes, objections, complaints, and queries

In terms of Regulations 49 and 50 of the Local Government: Municipal Finance Management Act, 56 of 2003 – Municipal Supply Chain Management Regulations (Board Notice 868 of 2005):

- a) Persons aggrieved by decisions or actions taken by the Kouga Local Municipality in the implementation of its supply chain management system, may lodge within fourteen (14) days of the decision or action, a written objection or complaint or query or dispute against the decision or action.

C.1.6.4.2 Appeals

- a) In terms of Section 62 of the Local Government: Municipal Systems Act, 32 of 2000 a person whose rights are affected by a decision taken by the Municipality, may appeal against that decision by giving written notice of the appeal and reasons to the Municipal Manager within 21 days of the date of the notification of the decision.
- b) An appeal must contain the following:
 - i) Must be in writing
 - ii) It must set out the reasons for the appeal
 - iii) It must state in which way the Appellant's rights were affected by the decision.
 - iv) It must state the remedy sought; and
 - v) It must be accompanied with a copy of the notification advising the person of the decision

C.1.6.4.3 Right to approach the courts and rights in terms of Promotion of Administrative Justice Act, 3 of 2000 and Promotion of Access to Information Act, 2 of 2000

The sub- clauses above do not influence any affected person's rights to approach the High Court at any time or its rights in terms of the Promotion of Administrative Justice Act and Promotion of Access to Information Act.

C.1.6.4.4 All requests referring to sub clauses F.1.6.4.1 and F.1.6.4.2 must be submitted in writing to:

The Municipal Manager, Kouga Local Municipality, PO Box 21, Jeffreys Bay, 6330.

C.1.6.4.5 All requests referring to clause C.1.6.4.2 3 regarding access to information or reasons must be submitted in writing to:

The Municipal Manager, Kouga Local Municipality, PO Box 21, Jeffreys Bay, 6330.

C.1.7 Kouga Local Municipality Supplier Database Registration

Tenderers are required to be registered on the Kouga Local Municipality's Supplier Database as a service provider. Tenderers must register as such upon being requested to do so in writing and within the period contained in such a request, failing which no orders can be raised or payments processed from the resulting contract. In the case of Joint Venture partnerships this requirement will apply individually to each party of the Joint Venture.

Tenderers who wish to register on the Kouga Local Municipality's Supplier Database may collect registration forms from the Supplier Management Unit located within the Supplier Management / Registration Office, 16 Woltemade Road, Jeffreys Bay.

C.1.8 National Treasury Web Based Central Supplier Database (CSD) Registration

Tenderers are required to be registered on the National Treasury Web Based Central Supplier Database (CSD) as a service provider. Tenderers must register as such upon being requested to do so in writing and within the period contained in such a request, failing which no orders can be raised or payments processed from the resulting contract. In the case of Joint Venture partnerships this requirement will apply individually to each party of the Joint Venture.

Tenderers who wish to register on the National Treasury Web Based Central Supplier Database (CSD) may do so via the web address <https://secure.csd.gov.za>.

It is each tenderer's responsibility to keep all the information on the National Treasury Web Based Central Supplier Database (CSD) updated.

C.2 Tenderer's obligations

C.2.1 Eligibility

*Delete the heading **Eligibility** and Replace with **Responsiveness Criteria***

C.2.1.1 *Delete the clause and replace with the following:*

Tenderers must submit a tender offer that complies in all aspects to the conditions as detailed in this document. Only those tenders that comply in all aspects with the tender conditions, specifications, pricing instructions and contract conditions will be declared responsive.

Add the following after C.2.1.2:

C.2.1.2 Only those tender submissions from which it can be established that a clear and unambiguous offer has been made to Employer, by whom the offer has been made and what the offer constitutes, will be declared responsive.

C.2.1.3 Only those tenders that satisfy the following criteria will be declared responsive:

C.2.1.3.1 Construction Industry Development Board (CIDB) Registration

Only those tenders submitted by tenderers who are registered, or capable of being registered, with an active status with the CIDB, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for a CE class of construction work, will be declared responsive. Tenderers must obtain such active status upon being requested to do so in writing and within the period contained in such a request, failing which their tenders will be declared non-responsive.

Joint Ventures are eligible to submit tenders provided that:

- a) every member of the joint venture is registered with an active status with the CIDB.
- b) the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the CE class of construction work: and
- c) the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a 5CE class of construction work or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.
- d) The CIDB grading is extended to Potentially Emerging (PE) Contractors one grade lower ie 4CE PE in the tender value range in terms of Regulation 25.(8).

For alpha-numeric associated with the contractor Grading Designations see Annex G attached.

C.2.1.4.2 Compliance with requirements of Kouga Local Municipality's SCM Policy and procedures

Only those tenders that are compliant with the requirements below will be declared responsive:

- a) Full name of entity submitting tender to be provided.
- b) Identification number or company or other registration number to be provided.
- c) Tax reference number to be provided.
- d) VAT registration number to be provided.
- e) A completed **Certificate of Authority for Partnerships/ Joint Ventures/ Consortiums** to be provided authorising the tender to be made and the signatory to sign the tender on the partnership /joint venture/consortium's behalf (applicable schedule to be completed).
- f) A copy of the partnership / joint venture / consortium agreement to be provided.
- g) A completed **Declaration of Interest – State Employees** to be provided and which does not indicate any non-compliance with the legal requirements relating to state employees (applicable schedule to be completed).
- h) A completed **Declaration – Conflict of Interest** and **Declaration of Bidder's past Supply Chain Management Practices** to be provided and which does not indicate any conflict or past practises that renders the tender non-responsive (applicable schedules to be completed).
- i) A completed **Certificate of Independent Bid Determination** to be provided and which does not indicate any non-compliance with the requirements of the schedule (applicable schedule to be completed).
- j) The tenderer (including any of its directors or members), has not been restricted in terms of abuse of the

- Supply Chain Management Policy.
- k) The tenderer's tax matters with SARS are in order.
- l) The tenderer is not an advisor or consultant contracted with the Employer.
- m) The tenderer is not a person, advisor, corporate entity, or a director of such corporate entity, involved with the bid specification committee.

C.2.1.4.3 **Minimum score for functionality compliance**

In order to be considered for a contract in terms of this tender, tenderers must achieve the minimum score for functionality as stated below. Verifiable proof of similar Scope of Work contracts successfully completed (i.e. Letter of Appointment and Completion Certificate), must be submitted in the applicable Returnable Schedule.

The description of the functionality criteria and the maximum possible score for each is shown in the table below. The score achieved for functionality will be the sum of the scores achieved, in the evaluation process, for the individual criteria.

CRITERIA	APPLICATION OF THE CRITERIA	WEIGHT
Company Experience Schedule 1H	Demonstrated experience of the tendering entity with respect to <u>comparable projects (Sportsfields, facilities, building projects)</u> by completing each row in the Returnable Schedule of work experience in full. <ul style="list-style-type: none"> • 4 x completed projects > R5m • 3 x completed projects > R5m • 2 x completed projects > R5m • 1 x completed projects > R5m 	(Max 40 points) 40 points 30 points 20 points 10 points
Key Personnel Schedule P-1	Contracts Manager Built / Civil Environment Qualification: B Eng / BSc / B Tech National Diploma Zero points if no Qualification (s) or CV attached Relevant Experience: <ul style="list-style-type: none"> • 10+ years • 6 – 10 years • 3 – 5 years • 0 - 2 years 	(Max 10 points) 10 points 8 points 5 points 0 points
Key Personnel Schedule P-2	Construction Manager (Site Agent) Built / Civil Environment Qualification: B Eng / BSc / B Tech National Diploma Zero points if no Qualification (s) or CV attached Relevant Experience: <ul style="list-style-type: none"> • 10+ years • 6 – 10 years • 3 – 5 years • 0 - 2 years 	(Max 10 points) 10 points 8 points 5 points 0 points
Key Personnel Schedule P-3	General Foreman Relevant Experience: <ul style="list-style-type: none"> • 10+ years • 6 – 10 years • 3 – 5 years • 0 - 2 years 	(Max 10 points) 10 points 8 points 5 points 0 points
Key Personnel Schedule P-4	OH&S Agent (SACPCMP Registered – Proof required) Relevant Experience: <ul style="list-style-type: none"> • 10+ years • 6 – 10 years • 3 – 5 years • 1 - 2 years 	(Max 10 points) 5 points 4 points 3 points 1 point
Maximum possible score for Functionality		80 POINTS

The minimum score for functionality is **70%**. Tenderers that fail to achieve the minimum score for functionality will be declared as non-Responsive.

Where the entity tendering is a Joint Venture, the tender must be accompanied by a statement describing exactly what aspects of the work will be undertaken by each party to the joint venture (appended to Schedule 10, Part T2.2: Returnable Schedules).

Where the tenderer intends to sub-contract any of the work components listed above, full details of the intended sub-contractor and portions of work to be undertaken by them shall be provided with the tender. The verifiable experience of the sub-contractor relevant to the component of work to be performed by them will be taken into consideration when allocating scores.

Tenderers shall ensure that all relevant information has been submitted with the tender offer in the prescribed format to ensure optimal scoring of functionality points for each Evaluation Criteria. Failure to provide all information **IN THIS TENDER SUBMISSION** could result in the tenderer not being able to achieve the specified minimum scoring.

C.2.1.4.5 **Compulsory clarification meeting**

Tenderers are required to attend a compulsory clarification meeting and site visit at which they may familiarise themselves with aspects of the proposed work, services or supply and pose questions.

Details of the meeting(s) are stated in the General Tender Information.

Only those tenders submitted by tenderers who have signed the attendance register will be declared responsive.

C.2.1.4.6 **Good standing with Bargaining Council**

Only those tenders submitted by tenderers who are in good standing with the **Bargaining Council for the Civil Engineering Industry (BCCEI)** at the time of the tender award will be declared responsive. Tenderers must attach such proof to the schedule titled **Declaration in Respect of Compliance with Labour Legislation** or obtain such upon being requested to do so in writing and within the period contained in such a request, failing which their tenders will be declared non-responsive. Refer to Schedule 21 of the Returnable Schedules.

C.2.1.4.7 **Mandatory Sub-Contracting**

In terms of Regulation 9 of the Preferential Procurement Regulations, 2017, issued in terms of the Preferential Procurement Policy Framework Act (PPPFA) (Act No 5 of 2000), at least **30%** of the value of the Works shall be subcontracted to Exempt Micro-Enterprises (EMEs) or Qualifying Small Enterprises (QSEs) as defined in the PPPFA.

The Tenderer shall identify suitable EMEs or QSEs from the National Treasury's Central Supplier Database and/or the CIDB register of contractors.

The percentage value of work to be subcontracted to EMEs or QSEs shall be stated in the Preferencing Schedule (Schedule 20). Failure to sub-contract the stipulated minimum percentage for the advancement of EMEs and QMEs will result in the tender being declared non-responsive.

The Primary Contractor must note that a 5% Financial Penalty shall be deducted from the Contractor's Payment Certificate if the SMME Target of 30% has not been reached at Practical Completion Stage. The 30% shall be calculated on the total Final Contract Value, with no deductions made for any P&G or PC Sum costs.

C.2.3 **Check documents**

C.2.3 *Delete the clause and replace with the following:*

The Tenderer should check the tender documents on receipt for completeness, missing or duplicated pages, indistinct figures or writing and any obvious errors. The Tenderer must notify the Employer's Agent at once of any such problems identified

C.2.7 **Clarification meeting**

Add the following after the second sentence:

The arrangements for the compulsory site visit/clarification meeting are as stated on the General Tender Information page and in the Responsiveness Criteria (if applicable).

Tenderers should be represented at the site visit/clarification meeting by a person who is suitably qualified and experienced to comprehend the implications of the work involved.

C.2.8 **Seek Clarification**

Add the following after the first sentence:

The tenderer warrants that it has:

- a) inspected the Specifications and read and fully understood the Conditions of Contract.
- b) read and fully understood the whole text of the Specifications and Price Schedule and thoroughly acquainted itself with the nature of the goods proposed and generally of all matters which may influence the Contract.
- c) visited the site(s) where delivery of the proposed works will take place, carefully examined existing conditions, the means of access to the site(s), the conditions under which the delivery is to be made, and acquainted itself with any limitations or restrictions that may be imposed by the Municipal or other Authorities in regard to access and transport of materials, plant and equipment to and from the site(s) and made the necessary provisions for any additional costs involved thereby.
- d) requested the Employer to clarify the requirements contained in the Specifications and Price Schedule, the exact meaning or interpretation of which is not clearly intelligible to the tenderer.
- e) received any notices to the tender documents which have been issued in accordance with the Employer's SCM Policy.

The Employer will therefore not be liable for the payment of any extra costs resulting from any claim submitted by the tenderer arising from any alleged ambiguity or uncertainty contained in the tender document.

C.2.12 **Alternative tender offers**

C.2.12.1 *Add the following to C.2.12.1 at the end of the first sentence:*

If a tenderer wishes to submit an alternative tender offer, he shall do so as a separate offer on a separate set of tender documents. The alternative tender offer shall be submitted in a separate sealed envelope on a separate Form of Offer, both clearly marked "Alternative Tender" in order to distinguish it from the main tender offer.

While it is not necessary to duplicate all parts of the main tender offer, the alternative tender offer shall be supported by the following documents as applicable:

- a) the schedule that compares the alternative(s) offered with the requirements of the issued tender documents
- b) preliminary designs, calculations, drawings and all other pertinent technical information and characteristics must be submitted with the alternative tender offer, in order to enable the Employer to evaluate the efficacy of the alternatives proposed
- c) revised Bills of Quantities, or parts thereof, highlighting the changes made, together with a revised Summary, the total of which has been carried to the Form of Offer
- d) details of any proposed amendments to the Pricing Assumptions

C.2.12.3 *Add the following to C.2.12.1 at the end of the first sentence:*

An alternative of the highest ranked acceptable main tender offer that is priced higher than the main tender offer may be recommended for award, provided that the ranking of the alternative tender offer is higher than the ranking of the next ranked acceptable main tender offer.

The Employer's costs in confirming the acceptability of the alternative offer will be, *inter alia*, taken into account in considering the alternative offer.

The Employer will not be bound to consider alternative tenders and shall have sole discretion in this regard.

In the event that the alternative is accepted, the Contractor shall accept full responsibility that the alternative offer complies in all respects with the Employer's standards and requirements.

C.2.13 **Submitting a tender offer**

Add the following to C.2.13.1 at the end of the first sentence:

- C.2.13.1 Where the tendering entity is a joint venture it is recommended that the standard CIDB Joint Venture Agreement be used.

Add the following to C.2.13.3 at the end of the first sentence:

- C.2.13.3 Parts of each tender offer communicated on paper shall be submitted as an original, plus 0 (naught) copies.

Add the following to C.2.13.5 at the end of the first sentence:

- C.2.13.5 The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:

Employer: Kouga Local Municipality.
Physical address: 16 Woltemade Street, Jeffreys Bay.
Identification details: Bid Number: 115/2026
Title of Contract: UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

Sealed tenders with the Tenderer's name and address and the endorsement "**BID NO. 115/2026: UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY**" on the envelope, must be placed in the appropriate official tender box at the abovementioned address.

Add the following to C.2.13.6:

- C.2.13.6 A two-envelope procedure will **not** be followed (C.3.5).

Add the following after C.2.13.9:

- C.2.13.10 By signing the offer part of C1.1 Form of Offer and Acceptance the tenderer declares that all information provided in the tender submission is true and correct.

- C.2.13.11 The Employer shall not formally issue tender documents in electronic format and shall only issue tender documents in hardcopy. An electronic version of the issued tender documents may be made available to the tenderer, upon written request in terms of this clause, subject to the following:

- a) electronic copies of the issued tender documents, or parts thereof, will only be provided to tenderers who have been issued with the tender documents as contemplated in C.1.2 in hardcopy.
- b) The electronic version shall not be regarded as a substitute for the issued tender documents.
- c) The Employer shall not accept tenders submitted in electronic format. Only those tenders that have been completed on the issued hard copy tender document shall be considered, provided that printed Bills of Quantities, in the same format (that is, layout, billed items and quantities) as those issued electronically by the Employer, may be submitted with the tender as stated in C.2.13.2.
- d) Where Addenda have been issued which amend the Bills of Quantities, then the printed Bills of Quantities shall take these into account. The pages of the issued Bills of Quantities should not be removed from the tender document.
- e) The Employer accepts no responsibility or liability arising from any reliance on or use of the electronic version provided in terms of this clause. Tenderers are alerted to the fact that electronic versions of the tender documents may not reflect any notices or addenda that amend the tender document.
- f) Any non-compliance with these provisions, including effecting any unauthorised alterations to the tender documents as contemplated in C.2.11, shall render the tender non-responsive. The Employer reserves the right to take any action against such tenderer allowed in law including, in circumstances where the tender had already been awarded, the right to cancel the contract.
- g) In requesting the electronic version of the tender documents or parts thereof, the tenderer is deemed to have read, understood, and accepted all the above conditions.

C.2.15 **Closing time**

Add the following to C.2.15.1 after the first sentence:

- C.2.15.1 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.

C.2.16 **Tender offer validity**

Add the following to C.2.16.1 after the first sentence:

C.2.16.1 The tender offer validity period is **(90 calendar days)**.

C.2.16.2 *Delete the clause and replace with the following:*

Tender offers shall be deemed to remain valid until formal acceptance by the Employer of an offer at any time after the expiry date of the original tender offer validity period, unless the Employer is notified in writing of anything to the contrary, including any further conditions, by the tenderer.

Any further conditions introduced by the tenderer will be considered at the sole discretion of the Employer.

C.2.17 **Clarification of tender offer after submission**

Add the following to C.2.17 at the end of the third sentence:

A tender will be rejected as non-responsive if the tenderer fails to provide any clarification or supporting documents requested by the Employer within the time for submission stated in the Employer's written request for such clarification or documents.

C.2.18 **Provide other material**

Delete the following word in C.2.18.1:

C.2.18.1 notarized

Add the following to C.2.18.1 at the end of the first paragraph:

Provide, on written request by the Employer, where the transaction value (tendered amount) inclusive of VAT **exceeds R 10 million:**

- a) audited annual financial statement for the past 3 years, or for the period since establishment if established during the past 3 years, if required by law to prepare annual financial statements for auditing.
- b) a certificate signed by the tenderer certifying that the tenderer has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days.
- c) particulars of any contracts awarded to the tenderer by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract.
- d) a statement indicating whether any portion of the goods or services are expected to be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality or municipal entity is expected to be transferred out of the Republic.

Each party to a Consortium/Joint Venture shall submit separate certificates/statements in the above regard.

Add the following after C.2.18.2:

C.2.18.3 Tenderers shall fully cooperate with the Employer's external service provider appointed to perform a due diligence review and risk assessment upon receipt of such written instruction from the Employer.

Failure to fully cooperate could result in a tender being declared as non-responsive.

C.2.18.4 **Compliance with Occupational Health and Safety Act, 85 of 1993**

Tenderers are to note the requirements of the Occupational Health and Safety Act, 85 of 1993 and the Construction Regulations, 2014 issued in terms of Section 43 of the Act. The Tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

In this regard the Tenderer shall submit with his tender or upon request, appended to Schedule 16: Health and Safety Plan in T2.2 : Returnable Schedules, a draft Health and Safety Plan in respect of the Works in sufficient detail to demonstrate the necessary competencies and resources to perform the construction work all in accordance with the Act, Regulations and Health and Safety Specification in Part C3.7 Health and Safety Specifications for the works detailed in Part C3 Scope of works.

C.2.23 **Certificates**

Add the following after the first sentence:

The tenderer is required to submit the following:

C.2.23.1

Evidence of tax compliance

Tenderers shall be registered with the South African Revenue Service (SARS) and their tax affairs must be in order and they must be tax compliant. In this regard, it is the responsibility of the Tenderer to submit evidence in the form of a valid Tax Clearance Certificate issued by SARS to the Employer at the Supplier Management Unit located within the Supplier Management / Registration Office, *16 Woltemade Street, Jeffreys Bay*, or included with this tender. The tenderer must also provide its Tax Compliance Status PIN number on the **Compulsory Enterprise Questionnaire**

Each party to a Consortium/Joint Venture shall submit a separate Tax Clearance Certificate.

Tenderers are to note that the Employer will not award a contract to a Tenderer whose tax matters are not in order.

C.2.23.2

Broad-Based Black Economic Empowerment Status Level Documentation

In order to qualify for preference points, it is the responsibility of the tenderer to submit documentary proof, either as certificates, sworn affidavits or any other requirement prescribed in terms of the B-BBEE Act, of its B-BBEE status level of contribution in accordance with the applicable Codes of good practise as issued by the Department of Trade and Industry, to the Kouga Local Municipality at the Supplier Management Unit located within the Supplier Management / Registration Office, *16 Woltemade Street, Jeffreys Bay* or included with the tender submission.

Consortiums/Joint Ventures will qualify for preference points, provided that the **entity** submits the relevant certificate/scorecard in accordance with the applicable codes of good practise. Note that, in the case of unincorporated entities, a verified consolidated B-BBEE scorecard must be submitted in the form of a certificate with the tender.

Tenderers are further referred to the content of the **Preference Schedule** for the full terms and conditions applicable to the awarding of preference points.

The applicable code for this tender is the **Amended Codes for Measuring Broad-Based Black Economic Empowerment in the Construction Sector) unless in possession of a valid certificate in terms of the transitional arrangements contained in these Codes.**

The tenderer shall indicate in Section 4 of the **Preference Schedule** the Level of Contribution in respect of the enterprise status or structure of the tendering entity (the supplier).

Add the follow new clause after C.2.23.2

C.2.24

Proposed Deviations and Qualifications

Where the tenderer cannot tender in all respects in accordance with the provisions contained in the tender documents, all deviations therefrom shall be clearly and separately listed in the schedule titled **Proposed Deviations and Qualifications by Tenderer** in T2.2 Returnable Schedules, or in a tenderer's covering letter expressly referenced in this schedule.

The tenderer accepts that the Employer will examine such deviations in terms of clause C3.8.2 and shall not be bound to accept any such deviations or qualifications.

It must be clearly stated by the tenderer whether the sum tendered in the Tender Offer includes for all such deviations or qualifications listed or referred to in the schedule titled **Proposed Deviations and Qualifications by Tenderer** or not.

C.3 The Employer's undertakings

C.3.2 Issue Addenda

Delete the words "three days" from the first sentence and replace with:

"Five working days where possible"

Add the following to C.3.2 at the end of the paragraph:

Notwithstanding any requests for confirmation of receipt of Addenda issued, the tenderer shall be deemed to have received such addenda if the employer can show proof of transmission thereof (or a notice in respect thereof) via electronic mail, facsimile, or registered post.

C.3.4 Opening of tender submissions

Add the following to C.3.4.2 at the end of the paragraph:

The location for opening of the tender offers is the Tender Submission Office at the address as stated on the General Tender Information page.

C.3.8 Test for responsiveness

C.3.8.2 Delete par C.3.8.2 (c)

Replace the final sentence of C.3.8.2 with the following:

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the material deviation.

Add the following after clause C.3.8.2

C.3.8.3 The Employer reserves the right to accept a tender offer which does not, in the Employer's opinion, materially and/or substantially deviate from the terms, conditions, and specifications of the tender documents.

C.3.9 Arithmetical errors, omissions, and discrepancies

Add the following after clause C.3.9.2

C.3.9.3 In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are not priced, either excessively low or high, or not in proper balance with other rates or lump sums, the Tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the Employer is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it.

The Tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other related amounts as are agreed on by the Employer, but this shall be done without altering the tender offer in accordance with this clause.

Should the Tenderer fail to amend his tender in a manner acceptable to and within the time stated by the Employer, the Employer may declare the tender as non-responsive.

C.3.10 Clarification of a tender offer

Delete the clause and replace with the following:

C.3.10 The Employer may, after the closing date, request additional information or clarification from tenderer, in writing on any matter affecting the evaluation of the tender offer or that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 **Evaluation of tender offers**

Add the following paragraph below the heading:

The preference point system applicable to this tender is either the 80/20 or 90/10 preference point system and the lowest responsive tender will be used to determine the applicable preference point system.

Annex C

(normative) Standard Conditions of Tender

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:

- i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
- ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
- iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;

- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer’s opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer’s or the tenderer’s risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer’s addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer’s obligations in submitting a tender and the employer’s undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures. **The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:**

Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report

h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions,

preventing participating in the employer's procurement;

b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;

c) has the legal capacity to enter into the contract;

d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;

e) complies with the legal requirements, if any, stated in the tender data; and

f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,

b) inclusion of some of the returnable documents and

c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

Annex G
(normative)

Alpha-numeric associated with the Contractor Grading Designations

Table G1: Contractor grading designations and associated parameters, as per Government Notice 357 of 2019 [Notice No.42561], dated 23 May 2019.

Contractor Grading Designation	Tender Value Range designation	Maximum value of contract that a contractor is considered capable of performing (R)
1 (class of construction works)	1	500 000
2 (class of construction works)	2	1 000 000
3 (class of construction works)	3	3 000 000
4 (class of construction works)	4	6 000 000
5 (class of construction works)	5	10 500 000
6 (class of construction works)	6	20 000 000
7 (class of construction works)	7	60 000 000
8 (class of construction works)	8	200 000 000
9 (class of construction works)	9	No Limit

TENDER

PART 2 (OF 2): RETURNABLE DOCUMENTS

T2.1 List of Returnable Documents

T2.2 Returnable Documents

T2.1: LIST OF RETURNABLE DOCUMENTS

The original completed tender document (refer clauses 3.2 and 4.13 of the Tender Data), excluding Drawings, shall be returned with all the required information supplied, duly completed in non-erasable ink in all aspects.

The following documents and schedules are to be completed and returned, as they constitute the tender. Whilst many of the returnables are required for the purpose of evaluating the tenders, some will form part of the subsequent contract, as they form the basis of the tender offer. For this reason, it is very important that tenderers submit, return, complete and sign **all the information, documents and schedules, as requested.**

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES (Included hereafter for completion)

- 1A Status of Concern Submitting Tender
- 1B Authority for Signatory
- 1C Certificate of Attendance at Clarification Meeting
- 1D Declaration of Interest in Tender of Persons in Service of the State
- 1E Compulsory Enterprise Questionnaire
- 1F Declaration of Tenderer's Past Supply Chain Management Practises
- 1G Form MBD6: Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2022
- 1H Schedule of Work Satisfactorily carried out by the Tenderer for Private Clients or Organs of State
- 1I Schedule of Contracts Awarded to Tenderer by Organs of State
- 1J Company Information Required for Tenders greater than R 5 million
- 1K Certificate of Independent Bid Determination
- 1L Proposed Amendments
- 1M Proof or Registration and good standing with the Civil Engineering Bargaining Council (BCCEI)
- 1N Proof or Registration and good standing with the Construction Industry Development Board (CIDB)
- 1O Proof of Registration with the Supplier Database
- 1P Available personnel for this project:
Details of Experience and Qualifications for Contracts Manager, Construction Manager, General Foreman and OH&S Agent

2. RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES (To be attached with submission)

- 2A Original Valid Tax Clearance Certificate
- 2B Municipal Billing Clearance Certificate
- 2C B-BBEE Status Level Certificates / Consolidated Scorecard

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT (included hereafter for completion)

- 3A Record of Addenda to Tender Documents
- 3B Personnel Schedule
- 3C Declaration Concerning Fulfilment of the Construction Regulations
- 3D Schedule of Construction Equipment
- 3E Schedule of Proposed Subcontractors
- 3F Subcontractor Payment Declaration

4. OTHER SCHEDULES AND DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT (included hereafter for completion)

- C1.1 Form of Offer and Acceptance
- C1.2 Contract Data
- C2.2 Bill of Quantities

T2.2: RETURNABLE DOCUMENTS

1A: STATUS OF CONCERN SUBMITTING TENDER

1. General

State whether the tenderer is a company, a closed corporation, a partnership, a sole practitioner or a joint venture:

(Mark the appropriate option below)

Public Company	
Private Company	
Closed Corporation	
Partnership	
Sole Proprietary	
Joint Venture	
Co-operative	

2. Information to be provided (Attached to the tender)

If the Tendering Entity is a:		Documentation to be submitted with the tender
1	Closed Corporation, incorporated under the Close Corporation Act, 1984, Act 69 of 1984	CIPRO CK1 or CK2 (Copies of the founding statement) and list of members
2	Private Company incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 (Including Companies incorporated under Art 53 (b))	Copies of: a) CIPRO CM 1 – Certificate of Incorporation b) CIPRO CM 29 – Contents of Register of Directors, Auditors and Officers c) CIPRO CM 39 – Notice of Change of Directors for private companies d) Shareholders Certificates of all Members of the Company.
3	Private Company incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 in which any, or all, shares are held by another Closed Corporation or company with, or without, share capital	Copies of documents referred to in 1 and/or 2 above in respect of all such Closed Corporations and/or Companies.
4	Public Company incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 (Including Companies incorporated under Art 21)	A signed statement by the Company's Secretary confirming that the Company is a Public Company. Copy of CM 29
5	Sole Proprietary or a Partnership	Certified Copy of the Identity Document of: a) Such Sole Proprietary, or b) Each of the Partners in the Partnership Copy of the Partnership agreement

If the Tendering Entity is a:		Documentation to be submitted with the tender
6	Co-operative	CIPRO CR 2 – Copies of Company registration document. (The percentage of work to be done by each partner must clearly be indicated on Form RDB 1 (or RDB 2 as applicable) of the tender document: MBD 6.1 Preference Points Claim Form in terms of the Preferential Procurement Regulations 2001).
7	Joint Venture	All the documents (as described above) as applicable to each partner in the JV as well as a copy of the Joint Venture agreement. (The percentage of work to be done by each partner of the joint venture must clearly be indicated in the Joint Venture Agreement).

Note:

- (i) If the shares are held in trust provide a copy of the Deed of Trust (only the front page and pages listing the trustees and beneficiaries are required) as well as the Letter of Authority as issued by the Master of the Supreme Court, wherein trustees have been duly appointed and authorised, must be provided.
- (ii) Include a copy of the Certificate of Change of Name (CM 9) if applicable. No. CM 9: name change certificate will be accepted as proof alone, for registration.

3. Bidders Must Register for VAT or be Registered for VAT Purposes in Terms of the Value-Added Tax Act, (Act No. 89 of 1991)

(Make an X in the appropriate space below)

Yes

No

REGISTRATION NO:

1B: AUTHORITY FOR SIGNATORY

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for the relevant category.

A Company	B Partnership	C Joint Venture / Consortium	D Sole Proprietor	E Close Corporation

A Certificate for Company

I,, chairperson of the board of directors of, hereby confirm that by resolution of the board (copy attached) taken on 20....., * Mr / Ms acting in the capacity of, and who will sign as follows: be, and is hereby authorized to sign the tender and all documents and correspondences in connection with this tender as well as any contract resulting from it on behalf of the company.

As witnesses:

1. Chairman:
2. Date:

NAME	CAPACITY	SIGNATURE

Note:

* Delete which is not applicable.

This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.

Should the number of Directors / Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

B Certificate for Partnership

We, the undersigned, being the key partners in the business trading as hereby authorize * Mr / Ms, acting in the capacity of, and who will sign as follows: be, and is hereby authorized to sign the tender and all documents and correspondences in connection with this tender as well as any contract resulting from it on behalf of the company.

NAME	ADDRESS	SIGNATURE	DATE

Note:

* Delete which is not applicable.

This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.

Should the number of Directors / Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

C Certificate for Joint Venture or Consortia

We, the undersigned, are submitting this tender offer in a * Joint Venture / Consortium and hereby authorise * Mr / Ms , acting in the capacity of lead partner, and who will sign as follows: be, and is hereby authorized to sign the tender and all documents and correspondences in connection with this tender as well as any contract resulting from it on behalf of the company.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all partners to the * Joint Venture / Consortium.

NAME OF FIRM	ADDRESS	% OF CONTRACT VALUE	AUTHORISING SIGNATURE, NAME AND CAPACITY
(Lead Partner):			

Note:

* Delete which is not applicable.

This resolution must be signed by all the Members / Partners of the Bidding Enterprise.

Should the number of Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

D Certificate for Sole Proprietor

I,, hereby confirm that I am the sole owner of the business trading as

As witnesses:

- | | | | |
|----|-------|------------|-------|
| 1. | | Signature: | |
| 2. | | Date: | |

E. Certificate for Close Corporation

We, the undersigned, being the key members in the business trading as

hereby authorize * Mr / Mrs, acting in the capacity of, to sign all documents in connection with this tender and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note:

* Delete which is not applicable.

This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.

Should the number of Directors / Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

1C: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that

..... (Tenderer)

of

.....
..... (address)

was represented by the person(s) named below at the compulsory meeting held for all tenderers at
..... (location) on
..... (date), starting at (time).

We acknowledge that the purpose of the meeting was to acquaint ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting on behalf of **the tenderer**:

Name Signature

Capacity

Name Signature

Capacity

Attendance of the above persons at the meeting is confirmed by the **Employer's Representative**, namely:

Name Signature

Capacity Date & Time

1D: DECLARATION OF INTEREST IN TENDER OF PERSONS IN SERVICE OF THE STATE

1. Where the tenderer is a natural person, state / declare whether the tenderer or an employee is in the service of the state, or has been in the service of the state during the past twelve months.

YES / NO (INDICATE)

If so, state particulars:

.....

If so and where applicable, state the date of resignation:

.....

2. Where the tenderer is not a natural person, state / declare whether any of its directors, managers, principal shareholders or stakeholders is in the service of the state, or have been in the service of the state during the past twelve months.

YES / NO (INDICATE)

If so, state particulars:

.....

3. State / declare whether a spouse, child or parent of the tenderer or any of its directors, managers, shareholders or stakeholders referred to in subparagraph 2 is in the service of the state, or have been in the service of the state during the past twelve months.

YES / NO (INDICATE)

If so, state particulars:

.....

4. State / declare whether the tenderer or any of its directors, managers, shareholders, stakeholders or employees referred to in subparagraph 2 is a person who is an advisor or consultant contracted with the municipality or municipal entity.

YES / NO (INDICATE)

If so, state particulars:

.....

5. State / declare whether the tenderer or any of its directors, managers, shareholders or stakeholders referred to in subparagraph 2 is involved in another entity for this particular tender.

YES / NO (INDICATE)

If so, state particulars:

.....

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1E: COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. In the case of a joint venture, **separate** enterprise questionnaires in respect of each partner must be completed and submitted.

SECTION 1: NAME OF ENTERPRISE:

SECTION 2: VAT REGISTRATION NUMBER, IF ANY

SECTION 3: CIDB REGISTRATION NUMBER, IF ANY:

SECTION 4: PARTICULARS OF SOLE PROPRIETORS AND PARTNERS IN PARTNERSHIPS

Name*	Identity Number*	Personal Income Tax Number*

*Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

SECTION 5: PARTICULARS OF COMPANIES AND CLOSE CORPORATIONS

Company registration number

Close corporation number

Tax reference number

SECTION 6: RECORD OF SERVICE OF THE STATE

Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- | | |
|--|---|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following: (insert separate page if necessary)

Name of Sole Proprietor, Partner, Director, Manager, Principal Shareholder or Stakeholder	Name of Institution, Public Office, Board or Organ of State and Position held	Status of Service (tick appropriate column)	
		Current	Within last 12 months

*Insert separate page if necessary

SECTION 7: RECORD OF SPOUSES, CHILDREN AND PARENTS IN THE SERVICE OF THE STATE

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent of a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months been in the service of any of the following:

- a member of any municipal council
- a member of any provincial legislature
- a member of the National Assembly or the National Council of Province
- a member of the board of directors of any municipal entity
- an official of any municipality or municipal entity
- an employee of Parliament or a provincial legislature
- a member of an accounting authority of any national or provincial public entity
- an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)

Name of Spouse, Child or Parent	Name of Institution, Public Office, Board or Organ of State and Position held	Status of Service (tick appropriate column)	
		Current	Within last 12 months

*Insert separate page if necessary

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise:

- (i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
- (ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- (iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- (iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- (v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Enterprise name

1F: DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTISES

1. This form serves as a declaration to be used by the Employer in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
2. The tender of any Tenderer may be rejected if that Tenderer, or any of its directors have:
 - a) abused the Municipality's / Municipal entity's supply chain management system or been guilty of any improper conduct in relation to such system;
 - b) been convicted for fraud or corruption during the past five years;
 - c) wilfully neglected, reneged on or failed to comply with any government, Municipal or other public sector contract during the past five years; or
 - d) been listed in the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004).
3. In order to give effect to the above, this form and the questionnaire must be completed in full and signed. Failure to comply will result in the tender being declared non-responsive.

ITEM	QUESTION	RESPONSE	
4.1	<p>Is the Tenderer or any of its directors listed on the National Treasurer's database as a company or persons prohibited from doing business with the public sector?</p> <p>(Companies for persons who are listed on this database were informed in writing of this restriction by the National Treasury after the <i>audi alteram partem</i> rule was applied)</p> <p>The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za)</p>	Yes	No
	<p>If so, furnish particulars:</p>		
4.2	<p>Is the Tenderer or any of its directors listed on the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004)?</p> <p>(To access this Register enter the National Treasury's website, www.treasury.gov.za, click on the icon "Register for Tender Defaulters" or submit your written request for a hard copy of the Register to facsimile number 012-326-5445)</p>	Yes	No
	<p>If so, furnish particulars:</p>		

ITEM	QUESTION	RESPONSE	
4.3	Was the Tenderer or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes	No
	If so, furnish particulars:		
4.4	Was any contract between the Tenderer and the Municipality / Municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes	No
	If so, furnish particulars:		
4.5	Does the tenderer or any of its directors owe any Municipal rates and taxes or Municipal charges to the Municipality/Municipal entity, or to any other Municipality/Municipal entity, that is in arrears for more than three months?	Yes	No
	If so, furnish particulars:		

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1G: FORM MDB 6.1 – PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2023

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 To be completed by the organ of state

(delete whichever is not applicable for this tender).

- a) The applicable preference point system for this tender is the 80/20 preference point system.
- b) Either the 90/10 or 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.
- c) Either the 90/10 or 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

B-BBEE Status Level of Contributor	Number of Points for Preference (80/20)	Number of Points for Preference (90/10)
1	10	5
2	8	4
3	6	3
4	4	2
5	3	1
6	2	1
7	2	1
8	2	1
Non-compliant contributor	0	0

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals./

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	100

SPECIFIC GOALS

No	Specific Goals Categories	Max points allocation	Evaluation Indicators
1	B-BBE Status Level Contributor	10	As for B-BBEE points allocation table above.
2	The promotion of enterprises located in a specific province for work to be done or services to be rendered in that province.	10	10 Points = Located within the boundaries of the Kouga Local Municipality 6 Points - Located within the boundaries of Sarah Baartman District Municipality & Nelson Mandela Metro Municipality 4 Points - Located within the boundaries of the Eastern Cape 1 Point - Outside of the boundaries of the Eastern Cape
The promotion of enterprises located in a specific province for work to be done or services to be rendered in that province. Bidders MUST submit valid B-BBEE sworn affidavit/ certificate AND Latest Municipal Billing Clearance Certificate/ Copy of Municipal Account / Rental Documentation in the name of the bidding entity, to claim points for specific goals. Virtual offices will not be accepted.			

- 1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.
- 1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

$$Ps = 80 \left(1 - \frac{Pt - Pmin}{Pmin} \right) \quad \text{or} \quad Ps = 90 \left(1 - \frac{Pt - Pmin}{Pmin} \right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

3.2. **FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT**

3.2.1. **POINTS AWARDED FOR PRICE**

A maximum of 80 or 90 points is allocated for price on the following basis:

$$Ps = 80 \left(1 + \frac{Pt - Pmax}{Pmax} \right) \quad \text{or} \quad Ps = 90 \left(1 + \frac{Pt - Pmax}{Pmax} \right)$$

Where

- Ps = Points scored for price of tender under consideration
- Pt = Price of tender under consideration
- Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
 - (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system, then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

- Partnership/Joint Venture / Consortium
 - One-person business/sole propriety
 - Close corporation
 - Public Company
 - Personal Liability Company
 - (Pty) Limited
 - Non-Profit Company
 - State Owned Company
- [TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary.

**1H: SCHEDULE OF WORK SATISFACTORILY CARRIED OUT BY THE TENDERER FOR PRIVATE CLIENTS OR
ORGANS OF STATE**

(Organs of State include any Local, Provincial or National Government Authority)

The following is a statement of **similar work** (Sportsfields, facilities and buildings) successfully executed by myself/ourselves:

Employer, Contact Person and Telephone Number	Description of Contract	Value of Work Inclusive of VAT (Rand)	Date Completed (State current if not yet complete)

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1I: SCHEDULE OF CONTRACTS AWARDED TO THE TENDERER BY ORGANS OF THE STATE

(Organs of State include any Local, Provincial or National Government Authority)

In terms of Clause 21(d)(iii) of the Supply Chain Management Policy, the tenderer shall list hereunder, particulars of contracts awarded to him by any Organ of State, during the past 5 years. **Any material non-compliance or dispute concerning the execution of any of these contracts must be mentioned.**

Include only those contracts where the tenderer identified in the signature block below was directly contracted by the Employer. Tenderers must not include services provided in terms of a sub-contract agreement. Where contracts were awarded in the name of a joint venture and the tenderer formed part of that joint venture, indicate in the column entitled "Title of the contract for the service" that the contract was in joint venture and provide the name of the joint venture that contracted with the employer. In the column for the value of the contract for the service, record the value of the portion of the contract performed (or to be performed) by the tender.

Organ of state, i.e. national or provincial department, public entity, municipality or municipal entity	Title of contract for the service	Value of Work Inclusive of VAT (Rand)	Date Completed (State current if not yet complete)

Any material non-compliance or dispute concerning the execution of any of these contracts?	Yes	No
If so, furnish particulars:		

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1J: COMPANY INFORMATION REQUIRED FOR TENDERS GREATER THAN R 5 MILLION

1. Is the tenderer is required by law to prepare audited annual financial statements? YES / NO

2. If so, provide audited annual financial statements:

- for the past three years; or
- since their establishment if established during the past three years.

Indicate whether these have been included in the tender. YES / NO

3. If answer for Question No.1 is NO, does the tenderer have annual financial statements? YES / NO

4. If so, provide audited annual financial statements:

- for the past three years; or
- since their establishment if established during the past three years.

Indicate whether the annual financial statements have been included in the tender. YES / NO

5. If answer for Question No.1 is NO, the tenderer shall attach to this form a letter from the tenderer’s bank; in which the bank declares how the tenderer conducts its account. The contents of the bank’s letter must state the credit rating that it accords to the tenderer for the business envisaged by this tender. The minimum acceptable credit rating applicable to tenderers for this tender is a C credit rating. The value of the bank rating must be calculated and checked with R2.5 million. Failure to provide the required letter with the tender submission may render the tenderer’s offer unresponsive in terms of Clause 5.8 of the tender condition.

Indicate whether a credit rating letter from the bank has been included in the tender. YES / NO

6. Does the tenderer have any undisputed commitments for Municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days? YES / NO

If so, state particulars:

.....

.....

.....

7. Has any contracts been awarded to the tenderer by an organ of state during the past five years? YES / NO

If so, state particulars:

.....

.....

.....

8. Has there been any material non-compliance or dispute concerning the execution of such contract?

YES / NO

If so, state particulars:

.....
.....
.....

9. Is any portion of the goods or services expected to be sourced out from outside the Republic?

YES / NO

If so, state what portion and whether any portion of payment from the Municipality is expected to be transferred out of the Republic.

.....
.....
.....
.....

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1K: CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

.....
(Bid Number and Description)

in response to the invitation for the bid made by:

.....
(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of that:
(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation;
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium* will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

*** Joint Venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.**

- 9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed

Date

Name

Position

Tenderer

1L: PROPOSED AMENDMENTS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in **a covering letter to his tender and reference such letter in this schedule.**

The Tenderer's attention is drawn to Clause 3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the Employer's handling of material deviations and qualifications.

Page Number	Clause / Item	Proposal

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

1M : PROOF OF REGISTRATION WITH THE BARGAINING COUNCIL

Tenderers must attach to this page, proof of registration and good standing with the Bargaining Council. (In the case of Joint Ventures, proof must be provided for each partner).

1N : PROOF OF REGISTRATION WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

Tenderers must attach to this page, proof of registration and good standing with the CIDB. (In the case of Joint Ventures, proof must be provided for each partner).

10 : PROOF OF REGISTRATION WITH THE CENTRAL SUPPLIER DATABASE (CSD)

All existing and prospective service providers/creditors to the Kouga Municipality's supplier database should note that registration with the electronic Central Suppliers Database (CSD www.csd.gov.za for self-registering), developed by National Treasury, is a requirement.

Prospective tenderers are to attach the ***Certificate of Registration with CSD*** to this page.

1P : DETAILS OF EXPERIENCE AND QUALIFICATIONS FOR CONTRACTS MANAGER, CONSTRUCTION MANAGER (SITE AGENT), GENERAL FOREMAN AND OH&S AGENT

Tenderers shall set out in the Schedules hereunder details of the Experience and Qualifications for the Contract Manager, the Construction Manager (Site Agent), General Foreman and the OHS Safety Officer Experience in work of a similar nature to that for which their Tender is submitted.

The tenderer is reminded that the information provided with this Schedule shall be used in terms of Clauses F.2.1.4.3 in Part T.1.2 Tender Data to confirm the tendering entity's eligibility to tender, and the responsiveness of the Tender submitted. The tenderer is therefore required to supply detailed information relating to previous projects, and projects to date, to clearly illustrate that the tendering entity meets key staff experience requirements stipulated in Clause F.2.1.4.3.

Note: Only the information provided on this Schedule, or attached hereto, will be considered. Failure to complete this Schedule may result in the tender being non-responsive.

RETURNABLE SCHEDULE P-1 CONTRACTS MANAGER	NAME & SURNAME : YEARS ACCRUED RELEVANT EXPERIENCE : QUALIFICATIONS :				
CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE OF WORK R(m)	DATE COMPLETED	EMPLOYER AND CONSULTING ENGINEER (NAME, TEL No. AND FAX No.)

NOTE : Attached CV and Proof of Qualifications as per Tender’s Obligations clause C2.1.4.3, in order to score ANY Functionality Points.

Also add this person to the Company’s Organogram structure.

Number of sheets appended by the tenderer to this Schedule (If nil, enter NIL).

RETURNABLE SCHEDULE P-2 CONSTRUCTION MANAGER (SITE AGENT)	NAME & SURNAME : YEARS ACCRUED RELEVANT EXPERIENCE : QUALIFICATIONS :				
	CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE OF WORK R(m)	DATE COMPLETED

NOTE : Attached CV and Proof of Qualifications as per Tender’s Obligations clause C2.1.4.3, in order to score ANY Functionality Points.

Also add this person to the Company’s Organogram structure.

Number of sheets appended by the tenderer to this Schedule (If nil, enter NIL).

RETURNABLE SCHEDULE P-3	NAME & SURNAME :				
GENERAL FOREMAN	YEARS ACCRUED RELEVANT EXPERIENCE :				
	QUALIFICATIONS :				
CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE OF WORK R(m)	DATE COMPLETED	EMPLOYER AND CONSULTING ENGINEER (NAME, TEL No. AND FAX No.)

NOTE : Attached CV and Proof of Qualifications as per Tender's Obligations clause C2.1.4.3, in order to score ANY Functionality Points.

Also add this person to the Company's Organogram structure.

Number of sheets appended by the tenderer to this Schedule (If nil, enter NIL).

RETURNABLE SCHEDULE P-4 OHS SAFETY OFFICER	NAME & SURNAME : YEARS ACCRUED EXPERIENCE AS OHS SAFETY OFFICER : QUALIFICATIONS : SACPMP REGISTRATION NO :				
CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE OF WORK R(m)	DATE COMPLETED	EMPLOYER AND CONSULTING ENGINEER (NAME, TEL No. AND FAX No.)

NOTE : Attached CV and Proof of Qualifications as per Tender's Obligations clause C2.1.4.3, in order to score ANY Functionality Points.

Also add this person to the Company's Organogram structure.

2A: ORIGINAL VALID TAX CLEARANCE CERTIFICATE

In terms of Clause 43 of the Municipal Supply Chain Management Policy, tenderers must ensure that they are up-to-date with their payments of taxes.

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

The tenderer must attach to this page an **original(s)** of a **valid** Tax Clearance Certificate(s) and the Tax compliance Status pin must be submitted.

Note:

1. In order to meet this requirement bidders are required to complete in full the form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
3. The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
4. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.
5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za
6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za

2B: MUNICIPAL BILLING CLEARANCE CERTIFICATE
--

In terms of Clause 38 of the Municipal Supply Chain Management Policy, tenderers must ensure that they are up-to-date with their payments of municipal accounts.

The tenderer shall attach to this page a Municipal Billing Clearance Certificate, which provides proof that his payment of Municipal accounts is up-to-date.

These certificates are obtainable from:

Kouga Local Municipality
33 Da Gama Road
Jeffreys Bay.

Should the tenderer not be based in the Kouga Local Municipality, he shall submit a Municipal Billing Clearance Certificate issued by the municipality in which he is based.

2C: B-BBEE STATUS LEVEL CERTIFICATES / CONSOLIDATED B-BBEE SCORECARD

Bidders who qualify as EMEs in terms of the B-BBEE Act shall submit and attach to this page a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates.

Bidders other than EMEs shall submit and attach to this page their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.

A trust, consortium or joint venture acting as a legal entity shall submit and attach to this page their B-BBEE status level certificate.

A trust, consortium or joint venture acting as an unincorporated entity shall submit and attach to this page their consolidated B-BBEE scorecard as if they were a group structure and such a consolidated B-BBEE scorecard shall be prepared for every separate bid.

Tertiary institutions and public entities shall submit and attach to this page their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.

All EME / B-BBEE certificates must reflect the B-BBEE status level of the bidder and must be certified.

3A: RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Procuring Department before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

Addendum Number	Date	Title or Details
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Attach additional pages if more space is required.

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

3B: PERSONNEL SCHEDULE

The tenderer shall insert the number of personnel he proposes to employ on this tender/Contract:

JOB DESCRIPTION	NON-LOCAL (Key Personnel) (Permanently employed by Contractor)	LOCAL			
		Women	Men	Youth	SMME
Contract Manager**					
Site Agent**					
Quantity Surveyor					
Surveyors					
General Foreman					
Foremen					
Operators					
Bricklayers					
Carpenters					
Mechanics					
Electricians					
Watchmen					
Gang Bosses					
Pipe Layers					
Labourers					
* Other					
Total					

* To be filled in / completed by tenderer.

The CV's of the Contracts Manager and Site Agent must be attached, in which they highlight their previous experience. The Company Profile of the proposed Sub Contractor is also to be submitted.

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

3C: DECLARATION CONCERNING FULFILMENT OF THE CONSTRUCTION REGULATIONS

In terms of Regulation 4(3) of the Construction Regulations (2014), hereinafter referred to as the Regulations, promulgated on 7 February 2014 in terms of Section 43 of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the Employer shall not appoint a Contractor to perform construction work unless the Contractor can satisfy the Employer that his/her firm has the necessary competencies and resources to carry out the work safely and has allowed adequately in his/her tender for the due fulfilment of all the applicable requirements of the Act and the Regulations.

Tenderers shall answer the questions below:

- I confirm that I am fully conversant with the Regulations and that my company has (or will acquire / procure) the necessary competencies and resources to timeously, safely and successfully comply with all of the requirements of the Regulations.

(Tick)

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

- Indicate which approach shall be employed to achieve compliance with the Regulations.

(Tick)

Own resources, competent in terms of the Regulations (refer to 3 below)	<input type="checkbox"/>
Own resources, still to be hired and/or trained (until competency is achieved)	<input type="checkbox"/>
Specialist subcontract resources (competent) - Specify:	<input type="checkbox"/>

- Provide details of proposed key persons, competent in terms of the Regulations, who will form part of the Contract team as specified in the Regulations (CVs to be attached):**

.....

.....

.....

.....

4. Provide details of proposed training (if any) that will be undergone:

.....
.....
.....
.....
.....

5. List potential key risks identified and measures for addressing risks:

.....
.....
.....
.....
.....

6. I have fully included in my tendered rates and prices (in the appropriate payment items provided in the Bill of Quantities) for all resources, actions, training and any other costs required for the due fulfilment of the Regulations for the duration of the construction and defects repair period

(Tick)

Yes	
No	

SIGNATURE OF PERSON(S) AUTHORISED TO SIGN THIS TENDER:

1. ID NO:
(Name in Print):

2. ID NO:
(Name in Print):

3D: SCHEDULE OF CONSTRUCTION EQUIPMENT

The following are lists of major items of relevant equipment that I/we **presently** own or lease and will have available for this contract or will acquire or hire for this contract if my/our tender is accepted.

- (a) Details of major equipment that is owned by and immediately available for use on this Contract should my / our tender be accepted.

Quantity	Description, Size, Capacity, etc.

- (b) Details of major equipment that will be **hired in**, or acquired, for use on the Contract should my / our tender be accepted.

Quantity	Description, Size, Capacity, etc.

Attach additional pages if more space is required.

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that the contents of this schedule are, to my personal knowledge and best belief, both true and correct.

Signed

Date

Name

Position

Tenderer

3F: SUBCONTRACTOR PAYMENT DECLARATION

Contractors are required to confirm work performed by SMMEs prior to an invoice being submitted by the SMMEs. Once the SMMEs submit the invoice, the Contractor must pay the SMMEs within 7 days of receipt of the invoices.

If we are awarded a Contract we agree to the payment terms stipulated above. We understand and confirm that we will:

- 1) Confirm work performed by SMMEs prior to an SMME invoice being processed
- 2) Provide payment of the SMME invoice within 7 days of receipt of the invoice, regardless of whether this has been claimed/paid by the Employer.

We warrant that we have sufficient cash flow to facilitate this request.

I, the undersigned, warrant that I am duly authorised to do so on behalf of the enterprise and confirm that this declaration is binding and shall form part of the Contract agreement.

Signed

Date

Name

Position

Tenderer

CONTRACT

PART 1 (OF 4): AGREEMENT AND CONTRACT DATA

- C1.1 Form of Offer and Acceptance
- C1.2 Contract Data
- C1.3 Form of Guarantee
- C1.4 Health and Safety Agreement
- C1.5 Disclosure Statement
- C1.6 Adjudication Board Member Agreement

C1.1: FORM OF OFFER AND ACCEPTANCE

(Agreement)

1. OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following Works:

TENDER NO.: 115/2026: UPGRADE OF THE PHILLIPSVILLE SPORTS FACILITY IN HANKEY

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and Addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor 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 VALUE-ADDED TAX IS:

.....
.....
.....

..... Rand (in words); R (in figures)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in terms of the Conditions of Contract identified in the Contract Data.

For the **Tenderer**:

.....
Signature

.....
Name

.....
Capacity

Name and Address of Organisation:

.....
.....
.....
.....
.....

Signature and Name of Witness:

.....
Signature
.....
Name

Date:

2. ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement between the Employer and the Tenderer 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

Part C4: Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any Addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer 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 said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representative(s) of both parties.

The tenderer shall within two weeks after receiving a completed copy of this Agreement, including the Schedule of Deviation (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of the obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five (5) days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties.

For the **Employer**:

.....
Signature

.....
Name

.....
Capacity

Name and Address of Organisation:

.....
.....
.....
.....

Signature and Name of Witness:

.....
Signature

.....
Name

Date:

3. SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
2. A Tenderer'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 arising from the process of offer and acceptance, either as a confirmation, clarification or change to the tender 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 tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract.

1. Subject:
Details:
2. Subject:
Details:
3. Subject:
Details:
4. Subject:
Details:
5. Subject:
Details:
6. Subject:
Details:
7. Subject:
Details:

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer 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 Tender Schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the Tenderer and the Employer 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 tender documents and the receipt by the Tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.

For the Tenderer:

.....

Signature

.....

Name

.....

Capacity

Name and Address of Organisation

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Witness Signature

.....

Witness Name

.....

Date

For the Employer:

.....

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Name and Address of Organisation

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4. CONFIRMATION OR RECEIPT

The Tenderer, (now Contractor), identified on the Offer part of this Agreement, hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the (day)

of (month)

20 (year)

at (place)

For the **Contractor**:

.....
Signature

.....
Name

.....
Capacity

Signature and Name of Witness:

.....
Signature

.....
Name

C1.2: CONTRACT DATA

The General Conditions of Contract for Construction Works, Third Edition, (2015) published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, are applicable to this Contract and are obtainable from www.saice.org.za.

Copies of these Conditions of Contract may be obtained on the tenderer's own cost from the SAICE.
(Tel: 011 – 055 947).

PART 1: DATA PROVIDED BY THE EMPLOYER

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

Clause	Description / Wording
1.1.1.13	The Defects Liability Period is 12 months, measured from the date of the Certificate of Completion.
1.1.1.14	The time for achieving Practical Completion is 10 months including anticipated lag between current and new financial year budget allocation, calculated from the Commencement Date. Approximately 60% of the value of scope will be carried out in 26/27 Financial year and the remaining 40% in 27/28 Financial year. Therefore, the contractor must allow for temporal de-establishment and re-establishment, which will be approximately two months.
1.1.1.15	The Employer is the Kouga Local Municipality.
1.1.1.16	The Employer's Agent is represented by an employee duly authorised thereto in writing.
1.1.1.26	The Pricing Strategy is: Re-measurable Contract
1.2.1.2	The Employer's address for receipt of communications is: 33 Da Gama Road Jeffreys Bay Postal Address: P O Box 21 Jeffrey Bay 6330 Telephone: 042 200 2200 Email: tmakhwangeni@kouga.gov.za
1.2.1.2	The Employer's Agent's address for receipt of communications and notices is: AfriCoast Consulting Engineers (Pty) Ltd P.O Box 5104 Walmer Gqeberha 6065 Telephone: 081 394 7263 Email: sizanim@afriacoast.com

Clause	Description / Wording
3.2.3	<p>The Employer's Agent shall obtain specific approval from the Employer before executing any of his functions or duties according to the following Clauses of the General Condition of Contract:</p> <ol style="list-style-type: none"> 1. New Clause 3.2.3.1 "For expenditure on the Contract to exceed the Contract Sum"; 2. Existing Clauses: <ul style="list-style-type: none"> 3.3.1 - Nomination of person as Employer's Agent's Representative. 5.7.2 - Work at night as well as by day 5.8 – Non-working times 5.12 - Granting of extension of time excluding Clause 5.12.2.2 (Abnormal climatic conditions) 5.13 - Reduction of penalty for delay. 5.14.2 - The issue of a Certificate of Practical Completion. 5.14.4 - The issue of a Certificate of Completion. 5.16.1 - The issue of a Final Approval Certificate. 6.3 – Variation Orders which may exceed R 20 000 6.6 - Instruction to expend on Provisional and Prime Cost Sums 6.11 - Adjustment of General Items & Approval of Claims 8.2.2.2 - Order to repair and make good damage arising from any "excepted" risk.
3.2.4	<p>The Employer's Agent has been appointed as Agent on this contract, in terms of Clause 5 of the Construction Regulations, 2014 as promulgated in terms of Section 43 of the Occupational Health and Safety Act, 1993.</p> <p>The duly appointed H&S Officials has been appointed as Client Agents on this contract, in terms of Clause 5 of the Construction Regulations, 2014 as promulgated in terms of Section 43 of the Occupational Health and Safety Act, 1993. The Principal Contractor shall perform a preliminary assessment of the project generated H&S plan and submit such to the employers agent for legal compliance reassessment & verification / approval prior to any works commencing. The duly appointed H&S Officials will be responsible for further monitoring and the auditing of the approved H&S plan for legal compliance.</p>
4.3.1	<p>Add the following to the clause:</p> <p>"For conventional construction works the Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) shall apply and the minimum employment conditions which will apply shall be guided by the latest Sectorial Determination: Civil Employers Agenting Sector published from time to time.</p> <p>Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) as per Government Notice R63 of 25 January 2002, shall apply to works described in the Scope of Work as being labour intensive and which are undertaken by unskilled or semi-skilled workers."</p> <p>"The Contractor shall comply with the Occupational Health and Safety Specification prepared by the Employer in terms of the Construction Regulations, 2014 promulgated in terms of Section 43 of the Occupational Health and Safety Act (Act No. 85 of 1993).</p> <p>Without limiting the Contractor's obligations in terms of the Contract, the Contractor shall before commencement of the Works or any part thereof, be in the possession of an approved Health and Safety Plan."</p>
4.3	<p>Add the following at the end of Clause 4.3:</p> <p>"4.3.3 The Employer and the Contractor hereby agree, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Amendment Act, 1993 (Act 85 of 1993), hereinafter referred to as 'the Act', that the following arrangements and procedures shall apply between them to ensure compliance by the Contractor with the provisions of the Act:</p>

Clause	Description / Wording
	<p>(i) The Contractor undertakes to acquaint the appropriate officials and employees of the Contractor with all relevant provisions of the Act and the Regulations promulgated in terms of the Act.</p> <p>(ii) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and Regulations on the Contractor will be fully complied with. The Contractor accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and Regulations and expressly absolves the Employer from himself being obliged to comply with any of the aforesaid duties, obligations and prohibitions, with the exception of such duties, obligations and prohibitions expressly assigned to the Employer in terms of the Act and its associated Regulations.</p> <p>(iii) The Contractor agrees that any duly authorised officials of the Employer shall be entitled, although not obliged, to take such steps as may be necessary to monitor that the Contractor has conformed to his undertakings as described in paragraphs (i) and (ii) above, which steps may include, but will not be limited to, the right to inspect any appropriate site or premises occupied by the Contractor, or any appropriate records or safety plans held by the Contractor.</p> <p>(iv) The Contractor shall be obliged to report forthwith to the Employer and Employer's Agent any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the Act and Regulations, pursuant to work performed in terms of this Contract, and shall, on written demand, provide full details in writing, to the Employer and Employer's Agent, of such investigation, complaint or criminal charge.</p> <p>4.3.4 The Contractor shall furthermore, in compliance with Constructional Regulations 2014 to the Act:</p> <p>(i) Acquaint himself with the requirements of the Employer's health and safety specification as laid down in regulation 5(1)(b) of the Construction Regulation 2014, and prepare a suitably and sufficiently documented health and safety plan as contemplated in regulation 7(1)(b) of the Construction Regulation 2014 for approval by the Employer or his assigned agent. The Contractor's health and safety plan and risk assessment shall be submitted to the Employer for approval within fourteen (14) days after the Commencement Date and shall be implemented and maintained from the Commencement of the Works.</p> <p>(ii) The Employer, or his assigned agent, reserves the right to conduct periodic audits, as contemplated in the Construction Regulations 2014, to ensure that the Contractor is compliant in respect of his obligations. Failure by the Contractor to comply with the requirements of these Regulations shall entitle the Employer's Agent, at the request of the Employer or his agent, to suspend all or any part of the Works, with no recourse whatsoever by the Contractor for any damages incurred as a result of such suspension, until such time that the Employer or his agents are satisfied that the issues in which the Contractor has been in default have been rectified."</p>
5.3.1	<p>The documentation required before the commencement of the Works is:</p> <p>(i) Health and Safety Plan (Refer Clause 4.3)</p> <p>The Contractor shall deliver his health and safety plan, complete with Risk Assessment, in terms of Regulation 5(1) of the Construction Regulations (2014).</p> <p>(ii) Initial Programme (Refer Clause 5.6)</p> <p>The Contractor shall deliver his Initial Programme of carrying out the Works.</p> <p>(iii) Security (Refer Clause 6.2)</p> <p>The Contractor shall submit a Performance Guarantee from an Insurance Company or Bank to be jointly and severally bound with the Contractor, in accordance with the provisions of the Form of Guarantee, in a sum equal to ten per cent (10%) of the Contract Sum. The wording of the Guarantee shall be identical to the pro-forma provided under Clause C1.3: Form of Guarantee of the Contract Data.</p> <p>(iv) Insurance (Refer Clause 8.6)</p> <p>The Contractor shall submit a "Letter of Confirmation" from the approved Insurance Company certifying that:</p>

Clause	Description / Wording
	<p>a) that the applicable Contractor complies in full with all the requirements and stipulations of Clause 8.6 of the Conditions of Contract, as amended in the Contract Data and,</p> <p>b) the Insurance Company will immediately notify the Employers Agent of any changes or amendments to the policy / policies and,</p> <p>c) the Insurance Company will immediately notify the Employers Agent of any non-payment or default relating to the premiums and or policy / policies and,</p> <p>d) the Insurance Company will immediately notify the Employers Agent should any of the applicable insurances expire or be cancelled before the issue of the "Certificate of Completion" or the "Final Approval Certificate", as the case may be."</p>
5.3.2	The documentation shall be submitted within 14 days from the Commencement Date.
5.3.3	<p>Add the following to Clause 5.3.3 after the last sentence:</p> <p>"The Contractor shall not commence working until they have an approved project specific health and safety plan in terms of the Occupational Health and Safety Act 1993: Construction Regulations 2014 and complied with the initial requirements thereof."</p>
5.4.1	<p>Between the wording "... Site," and "the location" In the third line, add the following:</p> <p>"subject to the Contractor having an approved project specific health and safety plan in terms of the Occupational Health and Safety Act 1993: Construction Regulations 2014 and complied with the initial requirements thereof,"</p>
5.4.2	Access to and possession of Site shall not be exclusive to the Contractor but as set out in the Scope of Work and Site Information.
5.6.1	The Contractor shall deliver his Works programme within fourteen (14) days after the Commencement Date.
5.8.1	<p>Delete the words "between sunset and sunrise" in the first line and replace with "outside normal working hours".</p> <p>Non-working days are Saturdays and Sundays. Special non-working days are all applicable gazetted public holidays, election day of the local government elections and national elections (when applicable) and the year-end break.</p> <p>For the purposes of this Contract the year-end break shall be as declared by SAFCEC.</p> <p>The work done by the contractor should be done at hours of the day so as not to influence the normal operation of the existing infrastructure in any manner.</p>
5.8.3	<p>Add the following new Clause:</p> <p>"5.8.3</p> <p>The additional cost of supervision and monitoring by the Employers Agent or his representatives, outside non-working times, in accordance with Clause 5.8.1 shall be for the Contractor's account."</p>
5.12.2.2	<p>Add the following to Clause 5.12.2.2:</p> <p>The time period specified as the time for completion includes allowances for delays and days on which it is expected that work, on the critical path items of the Works, would be prevented due to normal weather conditions such as wind, rainfall or the subsequent waterlogged condition.</p> <p>Based on average weather conditions of wind, rain and sunshine the allowances are actual and consequential delays shall be as follows:</p> <ul style="list-style-type: none"> • 3 working days per month for the months of May to October • 2 working days per month for the months of November to April <p>If the Contractor has been prevented by these weather conditions from working on the critical path items of the works, then he must notify the Employer's Agent in writing. The submission shall be made within</p>

Clause	Description / Wording
	<p>five calendar days of the resumption of work.</p> <p>The Employer's Agent shall upon considering all the relevant factors determine the extension of time to be granted on the basis that an extension of time to the contract will only be granted if the total number of days upon which work on the critical items was prevented, exceeds the total number of days calculated in terms of the above allowance and considering the official contract period as a whole.</p> <p>The tendered sums of the appropriate time-related items shall be increased to take account of the extensions of time granted.</p>
5.12.2.4	In the event of any disruption which is entirely beyond the Contractor's control, the only compensation will be under the rates tendered for under items 1.2.8 through to 1.2.11.
5.12.3	Delete the entire subclause 5.12.3.
5.12.5	<p>Add the following to Clause 5.12</p> <p>5.12.5 Critical Path Provision</p> <p>A delay in so far as extension of time is concerned, will be regarded as a delay only if, on a claim by the Contractor in accordance with the General Conditions of Contract, the Employer's Agent rules that all progress on an item or items of work on the critical path of the approved programme for the execution of the Works by the Contractor, has been brought to a halt. Delays on normal working days only, based on a working week, of five normal working days, will be taken in account for the extension of time.</p>
5.13.1	The penalty for failing to complete the Works is R 5 000 per day.
5.14.1	The requirements for Practical Completion are that the Works reach a state of readiness, fit for the intended purpose and occupation without danger or undue inconvenience to the Employer.
5.14.2	<p>Issue of Certificate of Practical Completion.</p> <p>Replace "the Employer's Agent" in the second line with the following:</p> <p>", the Contractor shall notify the Employer's Agent, who shall inspect the works and the Employer's Agent"</p>
5.14.4	<p>Add the following to Clause 5.14.4:</p> <p>"The work listed in terms of Clause 5.14.2 shall however be completed within 21 days from the date of issue of the Certificate of Practical Completion.</p> <p>Should the Contractor fail to complete all the work so listed within the stated period of 21 days, the date of issue of the Certificate of Practical Completion shall be amended and extended in respect of the outstanding work by the amount of additional time taken by the Contractor to complete all such work."</p>
5.14.5.5	<p>Delete the contents of Clause 5.14.5.5 and replace with:</p> <p>"Insurance of the Works shall continue until the expiration of the Defects Liability Period, in terms of the new Clause 8.6 contained in this Contract Data".</p>
5.16.3	The latent defect period is 10 years.
6.2.1	<p>Replace the wording "as selected" in Clause 6.2.1 with "as stated".</p> <p>The security to be provided by the Contractor shall be:</p> <ul style="list-style-type: none"> • a Performance Guarantee of ten per cent (10%) of the Contract Sum, plus • Retention Money amounting to five per cent (5%) of the Contract Price. <p>Retention monies due shall be subjected to Clauses 6.10.1.3 and 6.10.3.</p>

Clause	Description / Wording
	<p>The Performance Guarantee shall be from an approved Insurance Company or Bank to be jointly and severally bound with the Contractor, in accordance with the provisions of the Performance Guarantee. A Retention Money Guarantee is permitted.</p> <p>The wording of the Performance Guarantee shall be identical to the pro-forma provided under Clause C1.3: Performance Guarantee of the Contract Data</p> <p>The time to deliver the Performance Guarantee is within fourteen (14) days after the Commencement Date.</p>
6.2.2	<p>Replace the entire contents of Clause 6.2.2 with the following:</p> <p>"If the Contractor fails in his obligations to provide the stated security within the period stated in Clause 5.3.2, or if the Performance Guarantee shall differ from the pro-forma provided under Clause C1.3: Performance Guarantee of the Contract Data, the Employer may terminate the Contract in terms of Clause 9.2."</p>
6.2.3	<p>Replace the entire contents of Clause 6.2.3 with the following:</p> <p>"The Contractor shall ensure that the Performance Guarantee remains valid and enforceable until the issue of the Certificate of Completion."</p>
6.5.1.2.3	<p>The percentage allowance shall be seven percent (7%).</p>
6.8.2	<p>Contract Price adjustment will not be applicable to this contract.</p>
6.8.3	<p>Price adjustments for variations in the costs of special materials are not allowed.</p>
6.10.1	<p>In subclause 6.10.1 delete "monthly".</p>
6.10.1.5	<p>The percentage advance on materials on site not yet built into the Permanent Works is 80%.</p>
6.10.3	<p>Replace the entire contents of Clause 6.10.3 with the following:</p> <p>"Payment of the amounts referred to in Clauses 6.10.1.1, 6.10.1.2, 6.10.1.3 and 6.10.1.4 shall be subject to a retention by the Employer of an amount (called the "retention money"), being the percentage retention stated in the Contract Data, of the said amounts due to the Contractor, until the retention money reaches the "Limit of retention money" stated in the Contract Data."</p> <p>The percentage retention shall be ten per cent (10%) and the "Limit of retention money" shall be five per cent (5%) of the Contract Price, excluding Value Added Tax.</p>
6.10.4	<p>Replace the wordings "within 7 days" and "within 28 days" in Clause 6.10.4 with the wording "within 5 working days: and "within 30 days".</p>
6.10.6.2	<p>Replace the contents of Clause 6.10.6.2 with the following:</p> <p>"No interest shall be payable to the Contractor upon any moneys retained or overdue in terms of the Contract."</p>
6.11.1	<p>Delete this clause.</p>
7.8	<p>The Defects Liability Period shall be twelve (12) months, measured from the date of Certificate of Completion.</p>
7.2.1	<p>Add the following at the end of Clause 7.2.1:</p> <p>"Unless otherwise directed in writing by the Employers Agent, all materials for the Permanent Works shall be new and unused."</p>
7.8.2.2	<p>In sub-subclause 7.8.2.2 add the following:</p> <p>", subject to such work being done on a written instruction by the Employer's Agent."</p>

Clause	Description / Wording
<p>8.6</p> <p>8.6.1</p>	<p><u>Delete Clause 8.6. and replace with the following:</u></p> <p>Notwithstanding the provisions contained in the General Conditions of Contract regarding insurance, and without limiting the obligations, liabilities and responsibilities of the Contractor in any way whatsoever and on the understanding that the Contractor is not relieved from his obligations towards the Employer regarding the provision (by the Contractor) of any other insurances, the Contractor shall effect and maintain for the duration of the Contract until the expiry of the Defects Liability Period, including initial transit to the Contract site</p> <p>⇒ Contract Works Insurance (including SASRIA Insurance) and</p> <p>⇒ Public Liability (Third Party) Insurance</p> <p>both in the joint names of the Employer and the Contractor (including all Sub-Contractors whether nominated or otherwise), and those on whose behalf the Employer has authority to arrange insurance. The Contractor shall pay for all deductibles incurred as a result of claims made under the Contract.</p> <p>The Policy will be subject to the normal Terms, Exceptions and Conditions applicable to such insurance and will provide the following cover:</p> <p><u>Section 1 – The Contract Works</u></p> <p>(a) The Contract Works to be undertaken in terms of the Insured Contract, including all temporary works erected or in the course of erection and all materials for incorporation therein.</p> <p>“Temporary Works” shall mean all constructional aids, equipment or structures (not being part of the permanent works) used or intended for use on the Insured Contract and which</p> <p>(i) do not comprise mobile plant,</p> <p>(ii) the Insured does not intend to remove from the Contract Site on completion of the Contract, and/or</p> <p>(iii) have no residual value at the completion of the Contract (other than scrap value) solely due to their specialized nature,</p> <p>to the extent that the value has been included in the Contract price.</p> <p>(b) Surrounding property (as defined in the Policy) not included in nor forming part of the property insured under Item 1 above.</p> <p><u>Section 2 – Contract Liability</u></p> <p>Indemnity against the insured parties legal liability in the event of accidental death of or injury to third party persons and/or accidental loss of or damage to third party property arising directly from the execution of the contract.</p> <p>THE SUMS INSURED/LIMIT OF LIABILITY</p> <p>Section 1 – CONTRACT WORKS</p> <p>(a) Property insured under Section 1(a) The Contract Works</p> <p>The Agreed and Accepted Contract Value (subject to a maximum of R100M) in respect of any one Contract plus a maximum of 25% escalation, unless the Insurers’ agreement to amend these limits is obtained in writing.</p> <p>(b) Property insured under Section 1(b) Surrounding Property R2,500,000 each and every loss</p> <p>SECTION 2 - CONTRACT LIABILITY</p> <p>Limit of Indemnity R10 000 000 (Ten Million Rand) for any one occurrence or series of occurrences arising out of one event.</p>

Clause	Description / Wording																																												
	<p>EXCLUDED CONTRACTS</p> <p>The following Contracts are specifically excluded from the “blanket” cover arranged by the Employer, and insurance cover will not be arranged by the Employer. The Employer shall arrange with the Insurer for specific insurance cover for these contracts, and shall confirm such arrangement and all specific Terms & Conditions of such policy with the Contractor in writing.</p> <ol style="list-style-type: none"> 1. Any Contract with a Contract Price at award of over R100,000,000 2. Any Contract with a construction period at award exceeding 24 months 3. Any Contract with a Maintenance or Defects Liability Period exceeding 12 months 4. Any Contract involving <ol style="list-style-type: none"> 4.1 Underground Mine or Colliery Working’ 4.2 Tunnelling 4.3 Foul Berthing 4.4 Stevedoring Work 4.5 “Wet” work at or about or connected with dams, docks, harbours, piers, breakwaters or otherwise involving construction in water <p>THE DEDUCTIBLES</p> <p>The first amount payable by the Insured in respect of each and every occurrence giving rise to a claim under the Policy shall be as follows:</p> <p>(A) <u>STANDARD BUILDING CONTRACTS</u></p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Description</th> <th colspan="2">Existing</th> <th colspan="2">Renewal</th> </tr> <tr> <th>Gross rate</th> <th>Excess</th> <th>Gross rate</th> <th>Excess</th> </tr> </thead> <tbody> <tr> <td>A1</td> <td>Contract Value up to R10M</td> <td>0.205%</td> <td>R 10,000</td> <td>0.205%</td> <td>R 10,000</td> </tr> <tr> <td>2</td> <td>Contract Value above R10M up to R25M</td> <td>0.255%</td> <td>R15,000</td> <td>0.255%</td> <td>R15,000</td> </tr> <tr> <td>3</td> <td>Contract Value above R25M</td> <td>0.255%</td> <td>R25,000</td> <td>0.255%</td> <td>R25,000</td> </tr> </tbody> </table> <p>(B) <u>CIVIL & ALL OTHER CONTRACTS</u></p> <table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Description</th> <th colspan="2">Existing</th> <th colspan="2">Renewal</th> </tr> <tr> <th>Gross rate</th> <th>Excess</th> <th>Gross rate</th> <th>Excess</th> </tr> </thead> <tbody> <tr> <td>B1</td> <td>Contract Value up to R1M Canals/water channels & bridges</td> <td>0.350%</td> <td>0.25% of claim minimum R10 000 R35,000</td> <td>0.350%</td> <td>R 10,000</td> </tr> </tbody> </table>		Description	Existing		Renewal		Gross rate	Excess	Gross rate	Excess	A1	Contract Value up to R10M	0.205%	R 10,000	0.205%	R 10,000	2	Contract Value above R10M up to R25M	0.255%	R15,000	0.255%	R15,000	3	Contract Value above R25M	0.255%	R25,000	0.255%	R25,000		Description	Existing		Renewal		Gross rate	Excess	Gross rate	Excess	B1	Contract Value up to R1M Canals/water channels & bridges	0.350%	0.25% of claim minimum R10 000 R35,000	0.350%	R 10,000
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Clause	Description / Wording																			
	2	Contract Value above R1M up to R5M Canals/water channels & bridges	0.350%	0.25% of claim minimum R20 000 R35,000	0.350%	0.25% of claim minimum R15,000 Minimum R35,000														
	3	Contract Value above R5M Canals/water channels & bridges	0.350%	0.25% of claim minimum R50 000 R50,000	0.350%	0.25% of claim minimum R50,000														
(C) LIABILITY RISKS																				
Liability limit: R10,000,000																				
<table border="1"> <thead> <tr> <th rowspan="2">Description</th> <th colspan="2">Existing</th> <th colspan="2">Renewal</th> </tr> <tr> <th>Gross rate</th> <th>Excess</th> <th>Gross rate</th> <th>Excess</th> </tr> </thead> <tbody> <tr> <td>All Contracts</td> <td>0.10%</td> <td> R25,000 in respect of loss or damage caused by Fire and damage to Underground Services. R20,000 in respect of all other losses. </td> <td>0.15%</td> <td> R25,000 in respect of loss or damage caused by Fire and damage to Underground Services. R10,000 in respect of all other losses. </td> </tr> </tbody> </table>							Description	Existing		Renewal		Gross rate	Excess	Gross rate	Excess	All Contracts	0.10%	R25,000 in respect of loss or damage caused by Fire and damage to Underground Services. R20,000 in respect of all other losses.	0.15%	R25,000 in respect of loss or damage caused by Fire and damage to Underground Services. R10,000 in respect of all other losses.
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(D) SASRIA																				
Rate : 1.00%																				
8.6.2	The Contractor will pay all premiums in connection with the insurance affected by the Contractor.																			
8.6.3	<p>In the event of any occurrence which is likely to give rise to a claim under the insurance arranged by the Contractor, the Contractor or sub-Contractor shall</p> <p>(a) in addition to any statutory requirement or other requirements contained in the Conditions of Contract, immediately notify the Employer's Insurance Brokers by telephone or in writing giving the circumstances, nature and an estimate of the loss or damage;</p> <p>(b) complete a Claims Advice Form available from the Insurance Brokers to whom the form shall be returned without delay – a copy shall be sent to the Employer's Agent;</p> <p>(c) negotiate the settlement of claims with the Insurers through the Employer's Insurance Brokers, subject to the settlement being approved by the Employer.</p> <p>The Employer and Insurers shall have the right to make all and any enquiries, either on the site or elsewhere, as to the cause and results of any such occurrence and the Contractor shall give full facilities for carrying out such enquiries.</p>																			
8.6.4	Any amount which becomes payable as a result of a claim by the Contractor under the insurance effected by the Contractor shall be paid net of the deductibles to the Employer, who shall pay the said amount to the Contractor upon rectification, repair or reinstatement of the loss or damage, but this																			

Clause	Description / Wording
	provision shall not in any way affect the Contractor's obligations, liabilities and responsibilities in terms of the Contract.
8.6.5	Submission of a Tender shall be deemed as acceptance by the Contractor that he is satisfied with the scope of the insurances effected by the Employer.
8.6.6	<p>The Contractor and/or Sub-Contractor shall provide, as a minimum, the following:</p> <ul style="list-style-type: none"> (a) Proof of registration with the Department of Labour as an employer, in terms of the Compensation for Occupational Injuries and Diseases Act 1993, as amended (b) Common Law Liability Insurance for the duration of the Contract Period and with a minimum Limit of Indemnity of not less than R1 000 000 for any one accident; (c) Insurance on an All Risks basis for construction plant, equipment and other things (except those intended to incorporation into the works) brought onto the site to the full value of such construction plant, equipment and other things; (d) Motor Vehicle Liability Insurance, comprising a minimum of Balance of Third Party motor risks, including Passenger Liability, subject to a minimum limit of R2,5 million; (e) Where the Contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the site, the Contractor shall satisfy the employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication, then such interest shall be noted by endorsement to the Contractor's Policies of Insurance. (f) Imported equipment or component parts or materials to be supplied in terms of this Contract which require any process of assembly or finishing in South Africa prior to delivery to the site are to be insured by the Contractor up to the commencement of transit to site of the assembled or finished equipment, component parts or materials, unless special arrangements are made with the Employer.
8.6.7	These insurances shall be maintained in force for the duration of the Contract, including any Defects Liability Period and in respect of Sub-Contractors, the Contractor shall be deemed to have complied with the provisions of the requirements relating to insurance by ensuring that the Sub-Contractors have affected such insurance.
8.6.8	The Contractor may affect, at his own cost, any insurance additional to that affected by the Employer which he deems necessary in his own interests. The Employer reserves the right to call for full information regarding such insurances.
8.6.9	The insurances to be provided by the Contractor and Sub-Contractor shall be effected with Insurers and on terms approved by the Employer (which approval shall not be unreasonably withheld) and the Contractor shall, if required by the employer, produce to the employer the Policy or Policies of insurance and the receipts for payment of the current premiums.
8.6.10	If the Contractor fails to effect and keep in force the insurances referred to, then the employer may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and, from time to time, deduct the amount paid by the Employer from any monies due or which may become due to the Contractor or recover same as a debt from the Contractor.
8.6.11	<p>Where the Contractor is responsible for the appointment of Sub-Contractors, then the Contractor shall</p> <ul style="list-style-type: none"> (a) ensure that potential and appointed Sub-Contractors are aware of the whole content of this Special Conditions of Contract Clause; and (b) Ensure the compliance of Sub-Contractors with this Special Conditions of Contract clause, where applicable. <p>The Contractor warrants that he shall give all notices and shall observe all the Terms and Conditions and requirements of all insurances applicable to this Contract.</p>

Clause	Description / Wording
9.1.4	<p>Replace the contents of Clause 9.1.4 with the following:</p> <p>“Up to the time of termination of the Contract by either party in terms of this Clause, or until the Contractor gives notice in terms of this Clause to terminate the Contract and the Contractor is precluded from exercising his right to terminate the Contract because the Employer agrees to bear any resultant additional costs provided for in Clause 9.1.2.2 hereof, the Contractor:</p> <p>a) will be entitled to an extension of calendar time for working days lost as may be approved by the Employer’s Agent, and</p> <p>b) will be reimbursed the cost of delays per working day, where the number of working days will be determined pro rata the effect the delays have on the progress of the work as agreed with the Employer’s Agent. Payment in full and final settlement will be made at the rates tendered for the payment items specially provided in the Bill of Quantities</p> <p>Where the circumstances described in Clauses 9.1.1 and 9.1.2 are applicable only to a certain portion of the contract, the Employer’s Agent will decide after consulting the Contractor, to what extent the contract as a whole is affected and whether or not a claim in terms of this Clause can be submitted.</p> <p>No payment will be made in terms of this Clause after the expiry of the Due Completion Date.</p>
10.3.2	Dispute resolution shall be by amicable settlement.
10.5.1	Dispute resolution shall be by ad-hoc adjudication.
10.5.3	The number of Adjudication Board Members to be appointed is one (1).
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.5.3 shall be by arbitration.
10.11	<p>Add the following additional clause:</p> <p>“Details to be confidential</p> <p>The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without the prior written consent of the Employer’s Agent.”</p>

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause	Description / Wording
1.1.1.9	The Contractor is:
1.2.1.2	The Contractor's address for receipt of communications and notices is: Address (Postal): Address (Physical): Telephone Number (Work): Telephone Number (After Hours): Facsimile Number: Electronic Mail Address (E-mail):

**PRO FORMA
PERFORMANCE GUARANTEE**

GUARANTOR DETAILS AND DEFINITIONS

“Guarantor” means:

Physical address:

“Employer” means:

“Contractor” means:

“Employers Agent” means:

“Works” means:

“Site” means:

“Contract” means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

“Contract Sum” means: The accepted amount inclusive of tax of R

Amount in words:

“Guaranteed Sum” means: The maximum aggregate amount of R

Amount in words:

“Expiry Date”: This Performance Guarantee shall remain in full force and effect **until the issue of the Certificate of Completion of the Works** in terms of the Contract. (Refer Clause 2 hereunder).

CONTRACT DETAILS

Employers Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate of Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1. The Guarantor’s liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor’s period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the date of issue by the Employers Agent of the **Certificate of Completion of the Works** or the date of payment in full of the Guaranteed Sum, whichever occurs first unless the Guarantor is advised in writing by the Employer of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated. The Employers Agent and / or the Employer shall inform the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
3. The Guarantor hereby acknowledges that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be

construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;

- 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employers Agent in an Interim or Final Payment Certificate has not been made in term of the Contract and failing such payment within (7) seven calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and / or the provisional / final sequestration and / or the provisional liquidation court order.
6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the **Final Payment Certificate** submit an **expense account** to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear zero percent (0%) interest.
8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
11. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
13. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
14. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms

of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory (1)

Capacity

Guarantor's signatory (2)

Capacity

Witness signatory (1)

Witness signatory (2)

ARTICLE OF AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL SAFETY ACT (1993)

BETWEEN

THE KOUGA LOCAL MUNICIPALITY
(Hereinafter referred to as the "EMPLOYER")

AND

.....
.....
.....

Herein represented by in his/her capacity as
....., duly authorised by virtue of a resolution dated
....., attached hereto as Annexure A, of the said
(Herein after referred to as the "CONTRACTOR")

WHEREAS the CONTRACTOR is the mandatory of the EMPLOYER as contemplated in an agreement in respect of:

.....
.....
.....

Contract number:

AND WHEREAS section 37 of the Occupational Health and Safety Act, 1993 (Act 85 of 1993, hereinafter referred to as the "ACT"), imposes certain powers and duties upon the EMPLOYER.

AND WHEREAS the parties have agreed to enter into an agreement in terms of section 37(2) of the ACT.

NOW THEREFORE the parties agree as follows:

- (a) The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.
- (b) The CONTRACTOR undertakes that all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations will be fully complied with. Provided that should the EMPLOYER prescribe certain arrangements and procedures, that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.
- (c) The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedure, if any, imposed by the ACT and Regulations and the EMPLOYER expressly absolves the EMPLOYER from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedure as the case may be.
- (d) The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with the undertakings as more fully set out in paragraphs (a) and (b) above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to inspect any appropriate records held by the CONTRACTOR or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

(e) The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigations, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such an investigation, complaint or criminal charge as the case may be.

Signature(s) of authorised agents:

.....

Name(s) (in block letters):

.....

Capacity of authorized agents:

.....

for and on behalf of the Contractor:

.....

.....

.....

(Name and address of organization)

Witness:

.....

(Full name in block letters as well as signature)

.....

(Signature)

Date:

for and on behalf of the Employer:

Signature of authorized agent:

Name of authorized agent:

Capacity of authorized agent:

for the **Employer**:

KOUGA LOCAL MUNICIPALITY
P O Box 21
Jeffreys Bay
6330

Witness:

.....
(Full name in block letters as well as signature)

.....
(Signature)

Date:

**PRO FORMA
DISCLOSURE STATEMENT**

Date:

Contract:
(Name)

Contractor:
(Name)

Employer:
(Name)

Employers Agent:
(Name)

Dear Sirs

I am willing and available to serve as (ad-hoc / standing) Adjudication Board Member in the above-mentioned Contract.

In accordance with the General Conditions of Contract for Construction Works Adjudication Board Rules relating to the disclosure statements by selected or nominated persons to the adjudication, I hereby state that:

- I shall act with complete impartiality and know of nothing at this time, which could affect my impartiality.
- I have had no previous involvement in this project.
- I do not have any financial interest in this project.
- I am not currently employed by the Contractor, Employer or Employers Agent.
- I do not have any financial connections with the Contractor, Employer or Employers Agent.
- I do not have or have not had a personal relationship with any authoritative member of the Contractor, Employer or the Employers Agent which could affect my impartiality.
- I undertake to immediately disclose to the parties any changes in the above position which could affect my impartiality or be perceived to affect same.

Should there be any deviation from the foregoing statements, details shall be given.

I further declare that I am experienced in the work which is carried out under the Contract and in interpreting the contract documentation.

Name in full:

Signature:

**PRO FORMA
ADJUDICATION BOARD MEMBER AGREEMENT**

This Agreement is entered into between:

Adjudication Board Member:

Name:

Physical Address:

Postal Address:

E-mail Address:

Facsimile Number:

Telephone Number:

Mobile Number:

Contractor:

Name:

Physical Address:

Postal Address:

E-mail Address:

Facsimile Number:

Telephone Number:

Mobile Number:

Employer:

Name:

Physical Address:

Postal Address:

E-mail Address:

Facsimile Number:

Telephone Number:

Mobile Number:

The Contractor and the Employer will hereinafter be collectively referred to as the Parties.

The Parties entered into a Contract for

..... (Name of project) which provides that a dispute under or in connection with the General Conditions of Contract for Construction Works, Second Edition 2015 (GCC), must be referred to **ad-hoc / standing adjudication**.

The undersigned natural person has been appointed to serve as Adjudication Board Member and together with the undersigned Parties agree as follows:

1. The Adjudication Board Member accepts to perform his duties in accordance with the terms of the Contract, the General Conditions of Contract for Construction Works Adjudication Board Rules and this Agreement.

2. The Adjudicator undertakes to remain independent and impartial of the Contractor, Employer and Employers Agent for the duration of the Adjudication Board proceedings.
3. The Adjudication Board Member agrees to serve for the duration of the Adjudication Board proceedings.
4. The parties may at any time, without cause and with immediate effect, jointly terminate this Agreement.
5. Unless the Parties agree, the Adjudication Board Member shall not act as arbitrator or representative of either Party in any subsequent proceedings between the Parties under the Contract. No Party may call the Adjudication Board Member as a witness in any such subsequent proceedings.
6. The standing Adjudication Board's duties shall end upon the Adjudication Board Member(s) receiving notice from the Parties of their joint decision to diCEand the Adjudication Board.
7. The Adjudication Board Member shall be paid in respect of time spent upon or in connection with the adjudication including time spent travelling:
 - a. A monthly retainer of (amount) for (number) of months, and/or
 - b. A daily fee of (amount) based on a (number) hour day, and/or
 - c. An hourly fee of (amount), and/or
 - d. A non-recurrent appointment fee of (amount) which shall be accounted for in the final sums payable
8. The Adjudication Board Member's expense incurred in adjudication work shall be reimbursed at cost.

Upon submission of an invoice for fees and expenses to the Parties, the **(Contractor / Employer)** * shall pay the full amount within 28 days of receipt of the invoice and shall be reimbursed by the other party by half the amount so that fees and expenses are borne equally by the Parties. Late payment of such invoice shall attract interest at prime plus 3% points compounded monthly at a prime rate charged by the Adjudication Board Member's bank.

This Agreement is entered into by:

Contractor's signature:

Contractor's name:

Place:

Date:

Employer's signature:

Employer's name:

Place:

Date:

Adjudication Board Member's signature:

Adjudication Board Member's name:

Place:

Date:

*** Delete the inapplicable party**

CONTRACT

PART 2 (OF 4): PRICING DATA

- C2.1 Pricing Instructions
- C2.2 Bill of Quantities
- C2.3 Summary Page for Bill of Quantities

C2.1: PRICING INSTRUCTIONS

C2.1.1 PREAMBLE TO THE BILL OF QUANTITIES

- C2.1.1.1 The method of measurement published by the South African Bureau of Standards in Clause 8 of the Standardized Specifications for Civil Employers Agenting Construction is applicable, subject to the variations and amendments contained in the section "Applicable SABS 1200 Standardized Specifications".
- C2.1.1.2 Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardized Specifications. Clause 8 of each Standardized Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardized Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardized or Scope of Work, as applicable, shall prevail.
- C2.1.1.3 The reference clauses in a specification in which further information regarding the bill item can be obtained appear under the "Reference Clause" or "Payment Refers" column in the Bill. The reference clauses indicated are not necessarily the only sources of information in respect of schedule/billed items. Further information and set specifications may be found elsewhere in the contract documents. Standardized Specifications are identified by the letter or letters which follow SABS in the SABS 1200 series of specifications, e.g. G for SABS 1200 G.
- C2.1.1.4 Work reserved for Labour Intensive construction methods will be numbered with a prefix "LI" in the Bill to distinguish them from the conventional construction works. Such work shall be constructed using local labour who is temporarily employed in terms of the Scope of Work.
- C2.1.1.5 Unless otherwise stated, items are measured nett in accordance with the Drawings, and no allowance is made for waste. The Bill has to be completed in black non-erasable ink and the tenderer is referred to the Conditions of Tender as well as the Tender Data with regard to the correction of errors.
- C2.1.1.6 The quantities set out in the Bill of Quantities are the estimated quantities of the work. The tenderers attention is directed to Clause 6.7 of the Conditions of Contract and the Contractor will be required to determine the actual and final quantities of the Works to be executed and the Contractor shall undertake whatever quantities may be directed by the Employers Agent from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
- C2.1.1.7 The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out.
- C2.1.1.8 A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price / rate is entered will be considered to be covered by the other prices or rates in the Bill.
- C2.1.1.9 Except where rates only are required, the tenderer shall insert all amounts to be included in his total tendered price in the "Amount" column and show the corresponding total tendered price.
- C2.1.1.10 All prices or rates inserted in the Bill of Quantities shall be EXCLUDING VAT. Provision has been made on the Summary Page of the Bill of Quantities, for the addition of VAT.
- C2.1.1.11 Arithmetical errors of responsive tenders shall be corrected in the manner specified under the Conditions of Tender as well as the Tender Data. **(Refer also CIDB Practice Note No. 2 dated February 2008)**

C2.1.1.12 The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

mm	=	Millimetre	h	=	hour
m	=	Metre	kg	=	kilogram
km	=	kilometre	t	=	ton (1 000kg)
m ²	=	square metre	No	=	Number
m ² .pass	=	square metre-pass	Sum	=	Lump Sum
ha	=	hectare	MN	=	MegaNewton
m ³	=	cubic metre	MN.m	=	MegaNewton-metre
m ³ .km	=	cubic metre-kilometre	PC Sum	=	Prime Cost Sum
ℓ	=	Litre	Prov Sum	=	Provisional Sum
kℓ	=	kilolitre	Lab.month	=	Labourer.Month
MPa	=	Mega Pascal	%	=	per cent (percentage)
Mℓ	=	Mega litre	kW	=	kilowatt

C2.1.1.13 The quantities set out in the Bill are the estimated quantities of the Works but the Contractor will be required to undertake whatever quantities as may be directed by the Employers Agent from time to time. The Contract Price for the completed Contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.

C2.1.1.14 An item against which no price / rate is entered or where a word or phrase such as “included” or “provided elsewhere” will be accepted as a rate of nil (R 0,00) having been entered against such items and covered by the other prices or rates in the Bill. Any work executed to which such a payment item applies, shall be measured under the appropriate items in the Priced Bill and valued at a rate of nil (R 0,00). The rate of nil shall be valid irrespective of any change in the quantities during the execution of the Contract.

NOTE: CORRECTION OF ENTRIES MADE BY TENDERER

Any entry made by the tenderer in the Bill of Quantities, forms, etc., which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.

C2.2: BILL OF QUANTITIES

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	SABS 1200A	SECTION 1: PRELIMINARY & GENERAL				
1.1	8.3	FIXED CHARGED ITEMS				
1.1.1	PSA 8.3.1	Contractual requirements	Sum	1		
	8.3.2	Establishment of Facilities on the Site:				
	8.3.2.1	Facilities for Engineer				
1.1.2	8.3.2.1 (a) PSAB 3.2	a) Furnished office (1 No)	Sum	1		
1.1.3	PSAB 8.3.1	c) Contract Name board (2 No.) and Identity Boards (2 Nos.) with supports erected & moved complete.	Sum	1		
	8.3.2.2	Facilities for Contractor				
1.1.4	8.3.2.3	Facilities for the Contractor including offices, storage sheds, workshops, laboratories, ablution and latrine facilities, tools and equipment, water supplies, electric with water, access and accommodation of traffic.	Sum	1		
1.1.5	8.3.2.3	Temporary de-establishment before end of current financial year and re-establishment after new financial year.	Sum	1		
1.1.6	8.3.3	Other fixed charge obligations	Sum	1		
1.1.7	8.3.4.	Removal of Engineer's and Contractors site establishment and reinstatement of site on completion	Sum	1		
1.2	8.4	TIME RELATED ITEMS				
1.2.1	PSA 8.4.1	Contractual requirements (including insurances)	Sum	1		
	8.4.2	Operate and maintain facilities on Site:				
1.2.2	8.4.2.1 (c)	Facilities for Engineer as listed in Item 1.1.3	Sum	1		
1.2.3	8.4.2.2	Facilities for Contractor as listed in Item 1.1.4	Sum	1		
1.2.4	8.4.3	Supervision	Sum	1		
1.2.5	8.4.4	Company and Head Office overhead costs	Sum	1		
	8.4.5	Other time related obligations:				
1.2.7	PSA 8.4.5	Provision of Security Personnel	Month	8		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...					
1.2.8	PSA 8.15	Community Liaison Officer	Month	8	
1.2.9	8.8.2	Accommodation of traffic for road crossings, access and along road (refer to SANS 1921-2)	Sum	1	
	PSA 8.4.6	Compensation for delays incurred			
1.2.10		(a) Plant			
	PSA8.4.5	Other time related obligations:	Sum / day	15	
1.2.11		(b) Labour	Sum / day	15	
1.2.12		(c) Supervision	Sum / day	15	
1.2.13		(d) Other services, facilities etc. not covered by (a), (b) and (c).	Sum / day	15	
1.3	8.5	SUMS STATED PROVISIONALLY BY ENGINEER			
1.3.1	PSA 8.5	a) Acceptance Control Testing	Prov. Sum		R20 000.00
1.3.2	8.5 (b)	b) Overheads, charges and profit on (a) above	%	R20 000.00	
1.3.3		e) Provisional sum for work undertaken by Kouga Municipality Electrical Division	Prov. Sum		R20 000.00
1.3.4		f) Overheads, charges and profit on (e) above	%	R20 000.00	
1.3.5		g) Provisional sum for work undertaken by Kouga Municipality Water division	Prov. Sum		R20 000.00
1.3.6		h) Overheads, charges and profit on (g) above	%	R20 000.00	
1.3.7		Complying to EPWP, QA and Project Reporting (Annexure F and G)	Prov. Sum		R20 000.00
1.4	PSA 8.7	DAYWORKS (PROVISIONAL)			
1.4.1		Labour			
1.4.1.1		Allow for total remuneration paid to workers	Prov. Sum		R20 000.00
1.4.1.2	PSA 8.5	Percentage adjustment on Item 1.4.1.1 for Contractor's overheads and profit (State % and extend as an amount)	%	R20 000.00	
1.4.1.3		Skilled	h	20	
1.4.1.4		Semi-skilled	h	20	
1.4.1.5		Unskilled	h	20	
CARRIED FORWARD / ...					

BROUGHT FORWARD /...						
1.4.2		Materials				
1.4.2.1	8.5 (b.1)	Net cost of goods or materials	Prov. Sum			R50 000.00
1.4.2.2	PSA 8.5	Percentage adjustment on Item 1.4.2.1 Contractor's overheads and profit (State % and extend as an amount)	%	R50 000.00		
1.4.3		Contractors own Plant				
1.4.3.1	8.5 (a)	Allow for all-inclusive cost of using Contractor's own plant on site.	Prov. Sum			R50 000.00
1.4.4	8.8.4 (a)	Plant hired by the Contractor				
1.4.4.1	8.5 (b.1)	Net cost of hired plant	Prov Sum			R50 000.00
1.4.4.2	PSA 8.5	Percentage adjustment on Item 1.4.4.1 Contractor's overheads and profit (State % and extend as an amount)	%	R50 000.00		
1.4.5		Survey Beacons/Pegs				
1.4.5.1	8.5 (a)	Search for, record, reference and protect survey stations, bench marks, erf boundary pegs and other reference pegs and expose on completion of works	Sum	1		
1.5	8.8	TEMPORARY WORKS				
1.5.1	8.8.2	Dealing with traffic or accommodation of traffic and erecting signage	Sum	1		
1.5.2	PSA 8.8.6	Dealing with water	Sum	1		
1.5.3		Dealing with Public	Sum	1		
1.5.4	8.8.4	Dealing with existing infrastructure	Sum	1		
1.5.5		Barricading of Trenches	Sum	1		
1.5.6	PSL	Equipment for Testing				
1.5.6.1		Equipment supplied for testing and disinfection of structures and pipelines from existing infrastructure, including transportation costs (Prov.).	Sum	1		
1.5.6.2	8.8.1 PSA 5.8	Access to works including all temporary roads, excavations and ramps, etc.	Sum	1		
1.6	PSA 8.9	PROVISIONS FOR HEALTH & SAFETY				
1.6.1		Provisions for fulfilling OH&S functions	Sum	1		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...						
1.6.2		Provision for preparing a Hazard Identification and Risk Assessment (HIRA)	Sum	1		
1.6.3		Provision for the development of a documented Plan of OH&S Method Statements and/or Safe Work Procedures	Sum	1		
1.6.4		Provision for preparing a project specific OH&S Plan	Sum	1		
1.6.5		Provisions for the Implementation and Management of the OH&S Plan	Sum	1		
1.6.6		Provision for ensuring Contractor(s) compliance to statutory requirements, including monitoring and auditing of Contractor(s)	Sum	1		
1.6.7		Provision for OH&S training, promotion and awareness	Sum	1		
1.6.8		Provision for emergency preparedness & response plan (This item should include: First Aid, Fire and Explosions, Acts of Nature, Hazardous Chemical Substances and Flammable Substances Spillage, Political Unrest and Violence and/or Terrorism).	Sum	1		
1.6.9		Provision for occupational health (Medicals – pre and post employment; Physical and Psychological for work at elevated heights; Medical surveillance for hazardous work; Baseline & audiometric screening tests; HIV and AIDS Programmed; etc.). Contractor is to make allowance for 30 people.	Sum	1		
1.6.10		Provision for protective equipment & protective clothing. Contractor is to make allowance for 30 people.	Sum	1		
1.6.11		Provision for OH&S equipment. ontractor is to make allowance for 30 people.	Sum	1		
1.6.12		Provision for ensuring public health and safety	Sum	1		
1.6.13		Provision for occupational health and safety signage, pictograms and notices	Sum	1		
1.7	PSA 8.12	PROVISIONS FOR ENVIRONMENTAL MANAGEMENT PLAN (EMP)				
1.7.1		Provisions for fulfilling EMP functions	Sum	1		
1.8	PSA 8.10 PSX 13.1	PROVISION OF EME MANAGER	month	8		
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 1 - PRELIMINARY AND GENERAL						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2		SECTION 2: CLUB HOUSE REFURBISHMENT				
2.1		Provisional sum for the refurbishment of the existing clubhouse building, including electrical services	Prov. Sum			R600 000.00
2.2		Mark-up on Item 2.1 above	%		R600 000.00	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 2 - CLUB HOUSE						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3		SECTION 3: BOUNDARY WALL				
3.1	SANS 1200 C	SITE CLEARANCE				
3.1.1	8.2.1	Clear and grub	m ²	390		
3.2	SANS 1200 D	EARTHWORKS				
3.2.1	8.3.2(a)	Excavate in all materials and use for backfill or dispose, as ordered by the Engineer	m ³	105		
3.2.2	8.3.3(b)	Extra over Item 3.2.1 for excavation in hard rock material	m ³	5		
3.3	SANS 1200 GA	CONCRETE (SMALL WORKS)				
		Reinforced 25MPa cement concrete in:				
3.3.1		Concrete strip footing as ordered by Engineer	m ³	16		
3.3.2		Concrete in-fill using Class 25/7mm low slump concrete	m ³	24		
	8.3.1	Reinforcement				
3.3.3		Two (2) x Y16 x 780mm Starter Bars to be doweled 180mm deep into existing Strip Footing on each face of Boundary Wall. Doweled Starter Bars to be set into existing Strip Footing with Sika Anchor Fix or similar approved.	no	96		
3.3.4		Two (2) x Y16 x 2,4m Vertical Bars tied to doweled Starter Bars on each face of Boundary Wall.	no	96		
3.4		CEMENT BLOCK WALLS				
		<i>New Wall Panels and Pillars</i>				
		Supply and construct new cement block wall to a height of 2.7m or as directed by Engineer on Site with Inca-140 Pilaster block piers at 2,6m center to center spacing complete with low slump in-fill concrete in blocks:				
3.4.1		390 x 190 x 140mm Blocks	m ²	140		
3.4.2		Inca-140 pilaster blocks	No	336		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...					
		<i>Repairs to existing Wall Panels and Pillars</i>			
3.4.3		Demolish / remove existing damaged blocks and / or blockwork from existing Wall Panels as directed by Engineer on Site, stockpile and dispose of to approved Municipal Dumping Site.	m ²	160	
3.4.4		Demolish / remove existing damaged blocks and / or blockwork from existing Pillars as directed by Engineer on Site, stockpile and dispose of to approved Municipal Dumping Site.	No	2146	
		<i>Supply and construct new cement block wall panels and pillars to damaged sections as directed by the Engineer on Site including low slump in-fill concrete in blocks:</i>			
3.4.5		390 x 190 x 140mm Blocks	m ²	478	
3.4.6		Inca-140 pilaster blocks	No	5784	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 3 - BOUNDARY WALL					

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4	PX 2	SECTION 4: FENCING AND ACCESS GATES				
4.1	SANS 1200C	SITE CLEARANCE				
4.1.1	8.2.5	Take down existing fence, gates, posts, etc. and transport to municipal stores	m	16		
4.1.2	8.2.1	Clear existing fenceline (2m wide)	m	16		
4.2	PSA 8.4.7	ACCESS GATES				
	PSA 8.4.7	Supply and install Security Gate complete as specified including excavation, concrete base, concrete ground beam for roller track, roller track and posts, "shark tooth" type rail, fixtures and fasteners. Include for barrel type bolt, keeps and padlock plus two keys for:				
4.2.1		4m wide double leaf gate (Refer to dwg)	No	2		
	PSA 8.4.7	Supply and install Security Pedestrian Gate complete as specified including excavation, concrete base, posts, "shark tooth" type rail, fixtures and fasteners. Include for barrel type bolt, keeps and padlock plus two keys for:				
4.2.2		1.25 m Wide x 2.0m high pedestrian gate (refer to drawings)	No	2		
	SANS 1200G	Extra-over Item 4.2.1 and 4.2.2 for:				
4.2.3	8.4.1	200 x 300 Concrete sill using 10MPa/20mm concrete	m ³	4		
4.3		SECURITY FENCING				
4.3.1		Supply and install new Security Fencing on Perimeter Wall	Prov Sum	1	R30 000.00	R30 000.00
4.3.2		Mark-up on Item 4.3.1 above	%	R30 000.00		
4.4		CROWD CONTROL FENCE AROUND MAIN MATCH FIELD:				
4.4.1		Take down existing Crowd Control Fence, dispose of and supply and install new Crowd Control Fence around Main Match Field.	Prov Sum	1	R96 000.00	R96 000.00
4.4.2		Mark-up on Item 4.4.1 above	%	R96 000.00		
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 4 - FENCING & ACCESS GATES						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5		SECTION 5: NETBALL AND TENNIS COURT				
5.1	SANS 1200 DM	EARTHWORKS				
5.1.1	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m ³	68		
5.1.2	8.3.4	Cut to Spoil	m ³	650		
5.2	SANS 1200 C	SITE CLEARANCE				
5.2.1		Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc.	m ²	146		
5.2.2		Stripping average 150mm thick layer of top soil and stockpiling on site.	m ²	990		
		Compaction of Ground Surfaces:				
5.2.3		Rip and compact existing soil, including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density.	m ²	990		
		Filling Supplied by Contractor				
5.2.4		150mm Thick layer of G5 gravel compacted 95%	m ³	149		
5.3	SANS 1200 G	25MPA/19MM CONCRETE				
5.3.1		Surface beds.	m ³	99		
		Finishing Top Surfaces of Concrete Smooth with a Power Float				
5.3.2		Surface beds, slabs, etc.	m ²	990		
		Semi-Smooth Formwork To Sides				
5.3.3		Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	136		
		Saw-Cut Joints				
5.3.4		6 x 50mm Saw-cut joints in top of concrete.	m	466		
5.3.5		6 x 20mm Ream cut in top of concrete.	m	466		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...					
		Sika Pro-3 or Similar Approved Sealing Compound Including Backing Cord, Bond Breaker, Primer, etc.			
5.3.6		6 x 20mm Joint sealant in horizontal joints including raking out.	m	466	
		Fabric Reinforcement			
5.3.7		Reference 193 welded mesh reinforcement in surface beds lapped 300mm at edge of adjoining sheets and bound with annealed wire and laying on 100 x 100 x 80mm spacer blocks (Measured nett - no allowance made for laps).	m ²	990	
5.4		ONE COAT PRIMER AND TWO COATS "PLASCON POLVIN SUPER ACRYLIC PLAYER SURFACE COAT" TO MANUFACTURERS SPECIFICATIONS			
5.4.1		On surface beds	m ²	990	
5.5		50 X 50 X 2,5MM GALVANISED CLASS A WELDMESH FENCE			
5.5.1		Diamond mesh fence size 1800mm high	m	44	
5.6		GALVANISED GOAL POSTS			
5.6.1		460 x 460 x 510mm Concrete base including excavations, carting away, backfilling, etc.	No	2	
5.6.2		65mm Goal posts, 3550mm high including net	No	2	
5.7		TENNIS NET			
5.7.1		460 x 460 x 510mm Concrete base including excavations, carting away, backfilling, etc.	No	2	
5.7.2		Provide Tennis Net as per approved specifications	No	1	
5.8		LINE MARKINGS			
5.8.1		Lines, 50mm wide for Netball Court layout	m	156	
5.8.2		Lines, 50mm wide for Tennis Court layout	m	256	
5.9		PROPOSED GRANDSTAND (PRIME COST AMOUNT OF R20,000.00 EACH) IN ACCORDANCE WITH MANUFACTURE'S SPECIFICATIONS			
5.9.1		Grandstand, size 12m long x 2.7m wide x 1.95m high	PC Sum	1	R40 000.00 R40 000.00
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 5 - NETBALL & TENNIS COURT					

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6		SECTION 6: CRICKET PRACTICE NETS				
6.1	SANS 1200 DM	EARTHWORKS				
6.1.1	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m ³	66		
6.1.2		Import fill from other excavations on sitel and compact to 93% Mod AASHTO density	m ³	187		
6.2	SANS 1200 C	SITE CLEARANCE				
6.2.1		Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc.	m ²	36		
6.2.2		Stripping average 150mm thick layer of top soil and stockpiling on site.	m ²	240		
		Compaction of Ground Surfaces				
6.2.3		Rip and compact existing soil, including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density.	m ²	240		
		Filling Supplied by Contractor				
6.2.4		150mm Thick layer of G5 gravel compacted 95% under floors.	m ³	40		
6.3	SANS 1200 G	25MPA/19MM CONCRETE				
6.3.1		Surface beds.	m ³	18		
		Finishing top surfaces of concrete smooth with a power float				
6.3.2		Surface beds, slabs, etc.	m ²	116		
		Semi-smooth formwork to sides				
6.3.3		Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	116		
		Saw-cut joints				
6.3.4		6 x 50mm Saw-cut joints in top of concrete.	m	16		
6.3.5		6 x 20mm Ream cut in top of concrete.	m	16		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...				
		Sika Pro-3 or similar approved sealing compound including backing cord, bond breaker, primer, etc.		
6.3.6		6 x 20mm Joint sealant in horizontal joints including raking out.	m	16
		Fabric reinforcement:		
6.3.7		Reference 193 welded mesh reinforcement in surface beds lapped 300mm at edge of adjoining sheets and bound with annealed wire and laying on 100 x 100 x 80mm spacer blocks (Measured nett - no allowance made for laps).	m ²	116
6.4		FENCING		
		50 x 50 x 2,5mm Galvanised Class A Weldmesh fence including straining wires, etc.		
6.4.1		Diamond mesh fence size 2400mm high	m	105
6.4.2		Diamond mesh fence for roof net	m ²	75
6.4.3		Galvanised posts, 3m long	No	16
6.4.4		Galvanised diagonal bracing, 3.5m long	No	18
6.4.5		25Mpa Concrete base 600 x 600 x 600, including excavations, carting away, backfilling, etc.	m ³	8
6.5		ASTRO TURF		
6.5.1		Supply and install complete Astro Turf as specified	Sum	1
6.6		CRICKET SIGHT SCREENS & WALLS		
		Excavation in consolidated earth not exceeding 2m deep		
6.6.1		Trenches.	m ³	104
6.6.2		Extra over all excavations for carting away surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor.	m ³	26
6.6.3		Shore sides of trench and hole excavations not exceeding 1,5m deep.	m ²	85
6.6.4		Keeping excavations free of all water other than subterranean water.	Item	1
CARRIED FORWARD / ...				

BROUGHT FORWARD /...						
6.6.5		Earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density:				
6.6.6		Backfilling to trenches, holes, etc.	m ³	75		
6.7	SANS 1200 G	CONCRETE				
6.7.1		10MPa/19mm concrete for filling of Brick Cavities	m ³	5		
6.7.2		25MPa/19mm concrete for Strip Footings	m ³	21		
		10mm thick "Jointex" expansion joints between vertical concrete and brick surfaces				
6.7.3		Exceeding 300mm wide	m ²	11		
		High tensile steel reinforcement in various diameter sizes				
6.7.4		Mild steel reinforcement	t	1.23		
6.8		BRICKWORK				
		Brickwork of NFX bricks (14 MPa nominal compressive strength) in class II mortar				
6.8.1		Half brick wall	m ²	29		
6.8.2		Mass brickwork in attached piers	m ³	2		
		Brickwork of NFP bricks in class II mortar				
6.8.3		Half brick wall	m ²	195		
6.8.4		Mass brickwork in attached piers	m ³	11		
		Bagging of 1:3 cement and sand mixture				
6.8.5		On external brick walls.	m ²	262		
		2,8mm Galvanised brick reinforcement				
6.8.6		75mm Wide reinforcement built in horizontally.	m	530		
		Cement plaster (1:5) on brickwork:				
6.8.7		On walls.	m ²	198		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...						
6.9		PAINTING				
		One coat primer and two coats "Plascon Polvin Super Acrylic PVA" to manufacturers specifications				
6.9.1		Plastered walls.	m ²	198		
6.9.2		Bagged walls.	m ²	198		
6.10		CRICKET NETS				
6.10.1		100mm Anchor Poles	No.	15		
6.10.2		75mm Poles	No.	28		
6.10.3		75mm Bracing Poles	No.	20		
6.10.4		Galvanised diagonal bracing, 3.5m long	No	16		
6.10.5		3.6m Diamond Mesh	m	96		
6.10.6		Diamond Mesh for Roof Net 3.6m High	m ²	65		
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 6 - CRICKET NETS						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7		SECTION 7: PAVILLION				
7.1		Provisional sum to construct pavillion structure complete, including male and female spectator ablutions, teams ablutions and referee cloakrooms as detailed in the design drawing	Prov. Sum			R1 200 000.00
7.2		Mark-up on Item 7.1 above	%		R1 200 000.00	
7.3		Provisional sum for architectural services to refine and submit drawings for approval	Prov Sum			R80 000.00
7.4		Mark-up on Item 7.3 above	%		R80 000.00	
7.5		Provisional sum for quantity surveying services	Prov Sum			R60 000.00
7.6		Mark-up on Item 7.5 above	%		R60 000.00	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 7 - PAVILLION						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8		SECTION 8: PARKING				
8.1	SANS 1200DM	EARTH WORKS				
		Roadbed preparation and compaction of in-situ material to a depth of 150mm				
8.1.1	8.3.3 (a)	Compact to 93% Mod AASHTO density	m ³	118		
8.1.2	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m ³	118		
8.2	SANS 1200DM	WEARING COURSE				
8.2.1	8.3.16	Construct 100 mm thick wearing course from commercial sources, compacted to 95% Mod AASHTO. (Wearing course to conform to TRH20, Table 2)	m ³	78		
8.2.2		Construct 600mm wide concrete v-channel to dwg	m	90		
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 8 - PARKING						

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
9		SECTION 9: ELECTRICAL LV DISTRIBUTION				
9.1		REMOVE VANDALIZED EQUIPMENT				
9.1.1		Removal and disposal of vandalized kiosk	Sum	1		
9.2		LOW VOLTAGE SUPPLY (Point of Supply)				
9.2.1		Supplying, installing, testing and commissioning of new kiosk	No	1		
9.2.2		Supplying, Installing, testing and commissioning of 63A TP Circuit Breaker in Kiosk	No	1		
9.2.3		Supply, programming, installation, testing and Commissioning of a Maximum Demand Energy Meter as per the Local Electricity supplier's Specification	No	1		
9.3		CABLING & INSULATED EARTH WIRE				
9.3.1		Supply, installation, testing and commissioning of PVC SWA/ECC Insulated Armoured 600/1000V 25mm ² 4-core Aluminium Conductor Cable 650mm deep in trench, or any other available wireway from Electricity Supplier's KIOSK/panel to Customer KIOSK	m	5		
9.3.2		Supply, installation, testing and commissioning of PVC SWA/ECC Insulated Armoured 600/1000V 25mm ² 4-core Aluminium Conductor Cable in ceiling void, trench, or any other available wireway from KIOSK to Main Distribution Board	m	95		
9.4		CABLE TERMINATIONS				
9.4.1		Supply and install terminations for PVC Insulated Armoured 600/1000V 25mm ² 4-core Aluminium Conductor Cable	No	4		
9.5		CONDUITING				
9.5.1		Supply and installation of 40mm diameter Galvanised Steel Conduit, galvanised strap saddles and all necessary accessories to install the 25mm ² 4-core cable from the trench to the ceiling void	m	4		
		40mm Round galvanised steel glandless conduit boxes complete with cover and couples for 2-, 3-, 4- or 5-way application				
9.5.2		Supply	No	2		
9.5.3		Install	No	2		
CARRIED FORWARD / ...						

BROUGHT FORWARD /...					
9.6		EXCAVATIONS			
		Excavate for cables, and sleeve earth trench including temporary support of sides, keeping excavations dry, backfilling and compacting to the Engineers specification including bedding under and filling around cable comprising sifted sand.			
9.6.1		Soil	m ³	86	
9.6.2		Soft Rock	m ³	43	
9.6.3		Hard Rock	m ³	14	
9.7		EARTHING			
9.7.1		Earthing of the complete electrical installation according to the SANS 10142 regulations.	Sum	1	
9.8		TEST AND COMMISSION			
9.8.1		Testing and commissioning of the complete electrical installation and issuing of Certificate of Compliance	Sum	1	
9.9		ADDITIONAL ELECTRICAL WORKS			
9.9.1		Sum allowed to be utilized for Electrical Connection application	Sum	1	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 9 - ELEC. LV DISTRIBUTION					

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
10		SECTION 10: SOCCER / RUGBY FIELD				
10.1	SANS 1200 C	TOPSOILING STRIPPING				
10.1.1		Strip field and dispose of all grassing to a depth of 50mm	m ²	22		
10.1.2		Rip and recompact existing top soil 150mm deep to 90% MOD AASHTO density	m ³	1320		
10.1.3		a) Supply, delivery, placement and compaction of approved topsoil 150mm layer thickness from commercial sources and compact to 90% MOD AASHTO	m ³	1320		
10.2		GRASSING				
10.2.1		Supply and plant instant lawn (Cynodon dactylon) including fertilizing topsoil.	m ²	8470		
10.3		MAINTENANCE				
10.3.1		Allow for maintenance grass to soccer field for a period of months including watering, weeding, fertilizing, mowing, replacement of dead plants, etc on a monthly basis	Months	8		
10.3.2		Allow for watering costs during establishment using reclaimed water from the Humansdorp Waste Water Treatment Works Incl. Transport	Kl	5000		
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 10 - SOCCER / RUGBY FIELD						

ITEM No	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<p>SECTION 11: CARETAKER HOUSE</p> <p>SECTION 1</p> <p>FOUNDATIONS</p> <p>SUPPLEMENTARY PREAMBLES</p> <p>Nature of ground Use "assumed to be" if no trial holes, soils investigations, etc. have been carried out - discuss with engineer. Use "Trial holes indicate that" where the ground has been investigated by means of trial holes</p> <p>Carting away of excavated material Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site</p> <p>SITE CLEARANCE</p> <p>Site clearance</p>				
11.1.1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etC.	m ²	76		
11.1.2	Stripping average 200mm thick layer of top soil and stockpiling on site	m ²	0		
	<p>EXCAVATION, FILLING,</p> <p>Excavation in earth not exceeding 2m deep</p>				
11.1.3	cut to fill	m ³	35		
11.1.4	Trenches and holes for thickening under surface beds etc	m ³	32		
	<p>Extra over all excavations for carting away</p>				
11.1.5	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m ³	2		
	<p>Keeping excavations free of water</p>				
11.1.6	Keeping excavations free of all water other than subterranean water	Item	1		
	<p>Hardcore (G5) filling compacted to 90% Mod AASHTO density</p>				
11.1.7	Under floors, etc. 150mm Layer	m ³	11.4		
	CARRIED FORWARD / ...				

BROUGHT FORWARD /...					
	REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES				
	25MPa concrete				
11.1.8	Concrete footings	m ³	15		
11.1.9	Concrete Slab	m ³	7.6		
	High Tensile Steel Bar Reinforcement To Structural Concrete Work				
11.1.10	All diameter bars.	kg	225		
11.1.11	Transport	km	120		
	Fabric Reinforcement To Concrete Work				
11.1.12	High tensile steel mesh Ref. 193 to concrete surface beds, slabs, etc.	m ²	76		
	SECTION 2				
	CONCRETE, FORMWORK AND REINFORCEMENT				
	SUPPLEMENTARY PREAMBLES				
	Cost of tests				
	The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the architect. The testing shall be undertaken by an independent firm or institution nominated by the contractor to the approval of the architect. (Test cubes are measured separately)				
	UNREINFORCED CONCRETE				
	10MPa/19mm concrete				
11.2.1	Filling to block walls at intersections	m ³	1		
	15MPa/19mm concrete				
11.2.2	Pavings cast in panels	m ³	5		
11.2.3	Steps	m ³	1		
	Finishing top surfaces of concrete smooth with a steel trowel				
11.2.4	Surface beds, slabs, etc.	m ²	76		
	Finishing top surfaces of concrete smooth with a steel trowel				
11.2.5	Surface beds, slabs, etc.	m ²	76		
	Wire brushing of concrete surfaces to expose aggregate				
11.2.6	Paving to falls	m ²	8.5		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.2.7	SMOOTH FORMWORK (DEGREE OF ACCURACY II) Smooth formwork to sides Steps	m ²	10		
11.2.8	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	36.8		
SECTION 3					
PRECAST CONCRETE					
SUPPLEMENTARY PREAMBLES					
Sizes					
Blocks, sills, etc measured linear shall be made in suitable lengths. Large size setting out drawings shall be prepared where necessary and submitted to the architect for approval before moulds are made.					
PRECAST CONCRETE					
Precast concrete finished smooth on exposed surfaces including bedding, jointing and pointing					
11.3.1	Precast Concrete Window sill	no.	5		
SECTION 4					
MASONRY SUPERSTRUCTURE					
Blockwork					
Blockwork in class II mortar (Caretakers house)					
11.4.1	390x90x190 deranco cement hollow core block (Internal)	m ²	55		
11.4.2	390x140x190 deranco cement hollow core block (external)	m ²	130		
Blockwork in class II mortar (Outside Screen Wall)					
11.4.3	390x140x190 deranco cement hollow core block (external)	m ²	5		
BLOCKWORK SUNDRIES					
Brickwork reinforcement					
11.4.4	75mm Wide reinforcement built in horizontally every course	m ²	55		
11.4.5	110mm Wide reinforcement built in horizontally every course	m ²	125		
11.4.6	Y12 Diameter high tensile steel bar reinforcement.	m	19		
Ties, Cramps, Etc					
11.4.7	2 x 30mm Galvanised hoop iron tie 600mm long twice screwed to timber frame and built into blockwork.	No	30		
11.4.8	4mm Diameter galvanised wire tie built into blockwork and wrapped twice around rafter and nailed to wall plate	m	40		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.4.9	Air Bricks, Etc 225 x 150mm Cement verminproofed louvred airbrick.	No	4		
11.4.10	Concrete prestressed fabricated lintels 90 x 70mm Lintels in lengths not exceeding 3m	m	0		
11.4.11	110 x 70mm Lintels in lengths not exceeding 3m	m	0		
11.4.12	Y16 Reinforced 20 Mpa Concrete beam infill inside hollowcore blocks (Ring Beam Around Entire Structure)	m	36.8		
SECTION 5					
WATERPROOFING					
DAMP-PROOFING OF WALLS AND FLOORS					
One layer of 375 micron "Consol Plastics Brikgrip DPC" embossed damp proof course					
11.5.1	In walls	m ²	82		
One layer of 250 micron "Consol Plastics Gunplas Black" waterproof sheeting sealed at laps with "Gunplas Pressure Sensitive Tape"					
11.5.2	Under surface beds	m ²	76		
SECTION 6					
ROOF COVERINGS, ETC.					
TILES					
User note:					
The fixing recommendations of the manufacturer of the tiles used for the specific region and/or situation are to be incorporated as supplementary preambles.					
Concrete tiles laid on an underlay of 250 micron plastic sheeting with 150mm lapped and sealed joints and nailed through underlay with non-corrosive tile nails and/or fixed with suitable non-corrosive clips as required nailed through underlay on and including 38 x 38mm sawn softwood battens at 320mm centres + Clips.					
11.6.1	Roof covering with pitch not exceeding 25 degrees	m ²	76		
11.6.2	Ridge tiles to match roofing tiles bedded and pointed in 1:3 cement mortar tinted to match tile colour	m	12.7		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
	<p>SECTION 7</p> <p>CARPENTRY AND JOINERY</p> <p>ROOFS ETC.</p> <p>Plate nailed timber roof truss construction The following is applicable in respect of roof trusses:</p> <p>Trusses are at maximum 760mm centres. Roof covering is concrete roof tiles on purlins/battens. Ceilings are 6,4mm sheeting on 38 x 38mm branding. The references given in the descriptions are to the respective types of trusses detailed on Drawing labelled XXX annexed to these bills of quantities/accompanying these bills of quantities for tender purposes.</p> <p>The dimensions in the descriptions of the trusses are nominal and actual measurements are to be obtained from the architect and/or the site before design or fabrication commences.</p>				
11.7.1	<p>Prefabricated SSAP gangnail double pitch roof truss constructed of 38 x 114mm timber n/e 25 degrees pitch spaced at 731 mm centres max with a span of 6052mm and eaves overhang both sides of 404mm, with concrete tiles on 38 x 38mm battens at 320mm centres on a single storey built +/- 3.5m above ground.</p>	No	17		
	Roof Loading Certificate	Sum	1		
11.7.2	<p>Sawn softwood 38 x 38mm Battens for fixing barge boards</p>	m	30		
11.7.3	38 x 76mm Wall plates	m	30		
11.7.4	38 x 114mm Bracing	m	60		
	<p>EAVES, VERGES, ETC.</p> <p>Everite FC77 pressed fibre-cement 80 x 200mm Fascias and barge boards including plastic H-profile jointing strips</p>				
11.7.5		m	42		
	<p>DOORS ETC</p> <p>Wrought meranti doors 44mm Framed, Ledged and batten door 813 x 2032mm (Includes frame and fitment)</p>				
11.7.6		No	4		
	<p>Hollow core flush doors with 3,2mm standard hardboard covering on both sides hung to timber frames 40mm Door 813mm x 2032mm high (Includes frame and fitment)</p>				
11.7.7		No	3		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.7.8	<p>Main Entrance Door 44mm Framed, Ledged and batten door 1612mm x 2032mm</p>	No.	1		
<p>WINDOWS</p>					
<p>Aluminium Windows</p>					
11.7.9	Window type W1 1200 x 1200mm high	No	2		
11.7.10	Window type W2 1200 x 900mm high	No	1		
11.7.11	Window type W3 900 x 900mm high	No	1		
11.7.12	Window type W4 600 x 600mm high	No	1		
<p>FRAMED FRAMES, ETC.</p>					
<p>Steel Burglar Proofing Burglar proofing to be "Heavy Duty" and to be approved by Engineer</p>					
	Supply and install hot dipped galvanised steel burglar proofing to window	m ²	5.13		Rate Only
<p>FITTINGS</p>					
<p>General The following cupboard fittings have been measured as complete units i.e. the components of the units have not been separately measured. The descriptions, therefore, of such units shall be deemed to include all components, assembling, housing, notching, glueing, blocking, planting on and screwing with countersunk screws, edge strips, decorative plastic finish, glass, ironmongery, metalwork, paint or varnish finishes, etc.</p>					
<p>Kitchen Cupboards, etc.</p>					
11.7.13	cupboard including double sink size 1600 x 460 x 900mm high with sides, bottom, divisions, shelf, back and single hinged doors.	No	1		
11.7.14	Grey Melamine Office Counter with hinged countertop, closed and painted front. 900mm High, full room width (3.0m) and 900mm wide top	No.	1		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
	<p>SECTION 8</p> <p>CEILING, PARTITIONS AND ACCESS FLOORING</p> <p>SUPPLEMENTARY PREAMBLES Descriptions: Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete</p> <p>NAILED UP CEILINGS</p> <p>6.4mm "Rhino" gypsum plasterboard with H-Strip joiners</p>				
11.8.1	Extra over ceiling for 650 x 650mm trap door of 38 x 38mm wrought softwood rebated framing with one 38 x 38mm sawn softwood cross brander covered with ceiling board and fitted flush in opening	No	1		
11.8.2	6,4 mm thick Rhinoboard ceiling on 38x38mm SAP Branderings at 400mm CTC including PVC H-section cover strips at joints.	m ²	76		
11.8.3	"Rhino" gypsum plasterboard cornices 75mm Coved cornices	m	96		
	Sundries				
11.8.4	75mm Thick mineral fibre insulation laid on top of ceilings between roof timbers, etc.	m ²	76		
11.8.5	Extra for forming 600 x 600 mm framed trap door in ceiling including cutting and fitting roof timbers around opening and 25 mm half round timber edge strip around edge of trapdoor.	No	1		
	SECTION 9				
	IRONMONGERY				
	HINGES, BOLTS, ETC.				
	Solid				
11.9.1	75 x 100mm Steel hinge Set	No	12		
11.9.2	75 x 100mm Brass hinge Set	No	0		Rate Only
	LOCKS				
	Union				
11.9.3	Two lever lockset (CZ682-24-95CH)	No	4		
11.9.4	Three lever lockset (CZ682-24-52CH)	No	3		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
	SECTION 10				
	PLASTERING				
	EXTERNAL PLASTER				
11.10.1	Cement plaster on brickwork On walls (12mm)	m ²	60		
11.10.2	On narrow widths (12mm)	m ²	30		
	INTERNAL PLASTER				
11.10.3	Cement plaster on brickwork On walls (12mm)	m ²	240		
11.10.4	On narrow widths (12mm)	m ²	50		
	SECTION 11				
	PLUMBING AND DRAINAGE				
	SANITARY FITTINGS				
11.11.1	Ceramic Basin Basin Complete with taps and all fittings	No	1		
11.11.2	Vaal Ceramic close coupled wc suite comprising, pan and 9 litre capacity cistern including galvanised fixing studs and double flap wooden seat	No	1		
	TILING				
11.11.3	Walls in splashbacks 300 x 600 - Low Grade	m ²	20		
11.11.4	Walls in splashbacks 300 x 600 - High Grade	m ²	20		
11.11.5	Porcelain floor tiles 430 x 430 - Low Grade	m ²	45		
11.11.6	Porcelain non-slip floor tiles 420 x 420 - High Grade	m ²	4.5		
11.11.7	Acrylic Fittings Including Assembling and Fixing in Position, Expanding Bolts and Mortices in Brick or Concrete Walls, Connecting Up, Etc. (Tap and Mixer Set Reference Numbers are those of Cobra Brassware) White plastic bath size 700 x 1700mm complete with chromium plated waste and building in to manufacturer's specification, Incl Taps brickwork, trap door complete.	No	1		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.11.8	TAPS, VALVES, ETC Chromium plated brass 15mm Star bibcock (Cobra 106 - 15)	No	4		Rate Only
SANITARY PLUMBING					
11.11.9	Excavation not exceeding 2m deep for pipe trenches	m ³	8.4		
11.11.10	Backfilling to pipe trenches compacted to 90% Mod AASHTO density	m ³	1		
11.11.11	Sandfilling supplied by contractor to pipe trenches compacted to 90% Mod AASHTO density	m ³	2		Rate Only
uPVC PIPES					
11.11.12	110mm Pipes laid in trenches (trenches elsewhere)	m	30		
11.11.13	40mm Pipes including holder batts for fixing	m	10		
11.11.14	50mm Pipes including holder batts for fixing	m	10		
11.11.15	110mm Pipes including holder batts for fixing	m	3		
Extra over uPVC pipes for fittings					
11.11.16	40mm Access bend	No	2		
11.11.17	110mm Access bend	No	1		
11.11.18	110mm Access junction	No	2		
11.11.19	110mm Rodding Eye	No	1		
11.11.20	110 x 40mm Reducing access junction	No	1		
11.11.21	110mm Access bend with anti-syphon horn.	No	1		
11.11.22	110mm Pan collar and joint to outgo of W.C. pan.	No	1		
11.11.23	110mm PVC vent cowl	No	1		
SUNDRIES					
11.11.24	110mm Gulley trap with hopper head	No	2		
11.11.25	Precast concrete gulley surround including embedding in concrete base.	No	2		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.11.26	Testing waste pipe system	Item	1		
	WATER SUPPLIES				
11.11.27	Excavation not exceeding 2m deep for pipe trenches	m ³	5		
11.11.28	Backfilling to pipe trenches compacted to 95% Mod AASHTO density	m ³	2		
	Polylink polypropylene pipes				
11.11.29	22mm Pipes laid in trenches (trenches elsewhere)	m	100		
11.11.30	15mm Pipes including holder batts for fixing	m	18		
11.11.31	22mm Pipes including holder batts for fixing	m	8		
	Extra over "Polylink" polypropylene pipes for fittings				
11.32	15mm Fittings	No	10		
11.33	22mm Fittings	No	7		
	150L 400KPA B-Grade SABS Geysers	no.	1		
	TESTING				
11.34	Testing water pipe system	Item	1		
	SECTION 12				
	PAINTWORK				
	ON FLOATED PLASTER				
	One coat primer and two coats interior/exterior quality PVA emulsion paint				
11.12.1	On internal walls	m ²	260		
11.12.2	On External Walls	m ²	65		
	ON PLASTER BOARD				
	One coat bonding liquid and two coats interior quality PVA emulsion paint				
11.12.3	On ceilings and cornices	m ²	76		
	ON FIBRE-CEMENT				
	One coat bonding liquid and two coats exterior quality PVA emulsion paint				
11.12.4	On fascias and barge boards not exceeding 600 mm girth	m ²	21		
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
11.12.5	One coat thinned (40/60 turpentine) exterior preservative sealer (suede finish) and 2 coats unthinned exterior preservative sealer On internal doors	m ²	15		
11.12.6	One coat thinned (40/60 turpentine) exterior preservative sealer (suede finish) and 2 coats unthinned exterior preservative sealer On external doors	m ²	14		
11.12.7	On windows, sash doors and fanlights	m ²	10		
11.12.8	On door frames etc	m ²	8		
SECTION 13					
ELECTRICAL					
PROVISION OF ELECTRICAL BOARD AND INTERNAL SURFACE MOUNTED DUCTING AND CABLING					
11.13.1	External bulkheads IP56 rated	No.	3		
11.13.2	Internal Ceiling Lights	No.	5		
11.13.3	Double Flourescent lights (2 x32W)	No.	4		
11.13.4	Provision of electrical distribution board complete incl. electrical compliancy certificate	No.	1		
11.13.5	10mm ² From Kiosk to Building	m	24		
11.13.6	4mm ² For Stove	m	15		
11.13.7	2.5mm ² T & E	m	60		
11.13.8	1.5mm ² T & E	m	60		
11.13.9	Light Switches	no.	6		
11.13.10	Plugs (Double)	no.	6		
11.13.11	Cable ducts surface mounted	m	60		
11.13.12	Earthing of the complete electrical installation according to the SANS 10142 regulations.	Sum	1		
11.13.14	Supply, installation, testing and commissioning of the complete Lightning Protection of the entire building in accordance with the SANS 62305 and SANS 10313 regulations.	Sum	1		Rate Only
CARRIED FORWARD / ...					

BROUGHT FORWARD /...					
	SECTION 14				
	RAIN WATER DISPOSAL				
11.14.1	uPVC rainwater goods.				
11.14.2	uPVC Halfround Gutter Complete with joints, mounts etc	m	26		
11.14.3	Extra on gutter for stopped end.	Nº	2		
11.14.4	Extra over gutter for nozzle outlet to suit 100 x 76 mm pipe, including galvanised wire balloon grating	Nº	2		
11.14.5	100 x 76 mm Rainwater pipe fixed to walls	m	8		
11.14.6	Extra on rainwater pipe for bend	Nº	6		
	SECTION 15				
	ARCHITECTURAL SERVICES				
11.15.1	Provisional sum for architectural services to refine and submit drawings for approval	Prov Sum			R40 000.00
11.15.2	Mark-up on Item 11.15.1 above	%		R40 000.00	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 11 - CARETAKER HOUSE					

ITEM No	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
12		SECTION 12: MISCELLANEOUS WORKS				
12.1		PLANTING OF INDIGENOUS TREES FOR SHADE:				
12.1.1		Supply, plant 20 x 50 litre bag size indigenous shade trees (white ironwood "Vepris Lancialata")	No	4		
12.2	PSX3	LINE MARKING MACHINE:				
12.2.1		Supply and deliver Line Marking Machine	Prov Sum	1		R6 000.00
12.2.2		Markup on Item 12.2.1	%		R6 000.00	
12.3		SCORE BOARD:				
12.3.1		Supply and deliver Score Board	Prov Sum	1		R12 000.00
12.3.2		Markup on Item 12.3.1	%		R12 000.00	
TOTAL CARRIED FORWARD TO SUMMARY: SECTION 12 - MISCELLENEOUS WORKS						

C2.3 SUMMARY OF THE BILL OF QUANTITIES

SECTION	DESCRIPTION	AMOUNT
SECTION 1	PRELIMINARY AND GENERAL	
SECTION 2	CLUB HOUSE	
SECTION 3	BOUNDARY WALL	
SECTION 4	FENCING & ACCESS GATES	
SECTION 5	NETBALL / TENNIS COURT	
SECTION 6	CRICKET PRACTICE NETS	
SECTION 7	PAVILLION	
SECTION 8	PARKING	
SECTION 9	ELECTRICAL LV DISTRIBUTION	
SECTION 10	SOCCER / RUGBY FIELD	
SECTION 11	CARETAKER HOUSE	
SECTION 12	MISCELLANEOUS WORKS	
SUB-TOTAL (A)		
VAT (15%)		
TOTAL (A + 15% VAT) CARRIED FORWARD TO: FORM OF OFFER AND ACCEPTANCE		

Notes:

1. Contract Price is not subject to Contract Price Adjustment (Clause 6.8.2 of the Conditions of Contract).
2. The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed

Date

Name

Position

Tenderer

CONTRACT

PART 3 (OF 4): SCOPE OF WORK

- C3.1 Description of the Works**
- C3.2 Engineering**
- C3.3 Procurement**
- C3.4 Construction**
- C3.5 Management**

C3.1: DESCRIPTION OF THE WORKS

STATUS

In the event of any discrepancy between the Scope of Work and any part of the SABS 1200 Standardized Specifications, the Bill of Quantities or the Drawings, the Scope of Work shall take precedence and prevail in the Contract.

C3.1.1 EMPLOYER'S OBJECTIVES

The objective of the Employer (Kouga Local Municipality) is to upgrade and refurbish the existing Phillipsville sports facility located in Hanke.

C3.1.2 OVERVIEW OF THE WORKS

The Phillipsville Sports Facility is the only sports facility in the town of Hankey and currently accommodates rugby and soccer. An assessment of the sports facility showed that it is in a fair to poor condition, with vandalism and poor maintenance being the main contributing factors to the current state of the facility.

The club house needs to be refurbished, new guard house, cricket nets and a new netball / tennis court need to be constructed. The existing boundary wall needs to be repaired in some sections, access gates need to be installed as well as security fencing around the fields need to be erected. The existing soccer / rugby field need to be redone to acceptable standards, with new pavilion, ablution facilities, and change rooms for referees and both teams.

C3.1.3 EXTENT OF THE WORKS

The works will take place within the Hankey area.

The Scope of this Contract includes:

- Construction of a Rugby / Football pitch.
- Installation of a pitch irrigation system.
- Construction of change room.
- Construction of a pavilion.
- Refurbishment of existing club house
- Construction of spectator ablution facilities.
- Construction of spectator steel fence for VIP area.
- Electrification of the facility and refurbishment of floodlights.
- Paving of driveways and parking areas.
- Construction of the security/guardroom.
- Construction of the Caretakers house.
- Construction of water line and standpipes.

C3.1.4 LOCATION OF THE WORKS

The town of Hankey is situated about 74km west of Gqeberha (Port Elizabeth) and is about 42km north-east of Jeffreys Bay, in the south-western part of the Eastern Cape Province.

The Phillipsville Sports Facility is situated at the corner of Damon Street and R331, just across Kleinrivier from Hankey Town.

Table 1: Location coordinates

AREA	No. of HH	LONGITUDE	LATITUDE
Hankey	2200	24.878976	-33.831786



Figure 1: Location of Phillippsville Sports Facility

C3.1.5 TEMPORARY WORKS

Normal temporary work such as supports for formwork and shoring of trenches, etc. will be required to facilitate construction.

The Contractor shall be responsible for designing and providing any temporary works required. Such temporary works shall be removed upon completion of the Works and the site of such temporary works re-instated to a pristine condition acceptable to the Environmental requirements.

C3.1.6 EXISTING SERVICES

The Contractor shall ensure that the position of all existing services affected by the works have been verified before construction works commences. The Contractor shall take all necessary steps to ascertain the location of existing services before commencing any portion of the Works and shall exercise the greatest care when working in the vicinity of such services.

Should it be necessary to lower or relocate a service, the Contractor will be required to make the necessary arrangements with the relevant service provider and to inform the engineer accordingly.

C3.1.7 PROVIDING ACCESS TO PRIVATE PROPERTIES, BUILDING AND FACILITIES

Access to properties, buildings and businesses must be provided by the Contractor at all times during the course of the contract. The Contractor shall provide suitable provision for pedestrians and vehicles to maintain such access. Such temporary access shall be in the form of portable bridges, temporary backfill or other approved means and shall always allow for the safe passage of vehicles, pedestrians, and goods. The Contractor shall be responsible for maintaining such crossings and removing the same when they are no longer required.

The full extent of all areas in which plant and personnel are operating shall be at all times be clearly demarked and barricaded to prevent access by members of the public.

C3.1.8 ACCOMMODATION OF TRAFFIC

The Contractor should note that no existing roads or traffic lanes may be closed to traffic without prior written permission of the Engineer and the approval of the KLM and or the Municipal Traffic Engineer's office.

Every effort shall be made by the Contractor to keep disruption of existing traffic and pedestrian movements to the absolute minimum during construction. Where existing roads are used, they shall be protected from damage by construction traffic and repaired where instructed by the Engineer.

The safety and convenience of the travelling public is to be considered of utmost importance and every effort must be made to ensure that all temporary road signs, cones, flagmen and speed controls are maintained and effective, and that courtesy is extended to the public at all times.

It is important that the traffic accommodation requirements described in these specifications are adhered to and that all installations meet with the approval of the relevant traffic authority.

Work, including the erection and removal of traffic control facilities, shall be executed between sunrise and sunset on Monday to Saturday, inclusive. Occupation of existing traffic lanes will only be allowed during daylight hours on normal working days, which are defined as Monday to Saturday, inclusive.

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

Failure to maintain road signs, warning signs or flicker lights, and the like, in good condition shall constitute ample reason for the Engineer to bring the works to a stop until the road signs, etc., have been repaired / reinstated to his satisfaction.

The Contractor may not commence construction activities before adequate provision has been made to accommodate traffic in accordance with the requirements of these specifications and Chapter 13 of Volume 2 of the South African Road Traffic Signs Manual (SARTSM).

The Contractor shall submit proposals in connection with all signs and accommodation of traffic to the Engineer for approval.

C3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX

Works designed by, per design stage:

Concept, feasibility and overall process	Employer's Agent
Basic engineering and detail layout to tender stage	Employer's Agent
Final design to approved for construction stage	Employer's Agent
Temporary works	Contractor
Preparation of as-built drawings & GIS information	Contractor/Employer's Agent

C3.2.2 DESIGN PROCEDURES

The Contractor shall take all statutory requirements, as well as the Site-Specific Health and Safety Specification and Basic Risk Assessment (refer to particular specification PA) into consideration when designing the Temporary Works.

C3.2.3 DRAWINGS

C3.2.3.1 SPECIFICATION AND DRAWINGS

The specification and drawings generally show the character and extent of the proposed work, and shall not be held as showing every minute detail of the work to be executed.

Contractors shall ensure that their copy of the specification is complete and that all drawings as listed have been received.

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

The drawings are listed under Appendix B, which are bound at the back of the document.

C3.2.3.2 RECORD DRAWINGS ('AS-BUILT')

The Contractor shall mark up on drawings provided to him for this purpose the exact positions and details of all infrastructures, pipelines and the like constructed under this contract. The marked-up drawings shall be handed to the Employers Agent monthly as the work progress. The Certificate of Completion shall not be issued before the Employers Agent is in receipt of all marked up drawings and other as-built information.

C3.2.4 WORK SEQUENCE

The sequence in which the work must be carried out, must be established in consultation with the Civil and Electrical Contractors, Engineer and any other Contractors on site.

C3.2.5 CONSTRUCTION METHODS

Construction methods used shall be environmentally friendly as fast as possible. No construction methods that will result in long term or permanent damage to the surrounding natural environment shall be allowed.

Care shall be taken when mixing, transporting and placing concrete to avoid spillage and wastage.

All construction work shall be undertaken in accordance with the Occupational Health and Safety Act and Construction Regulations.

C3.2.6 SERVICES KNOWN TO BE IN THE VICINITY OF THE WORKS SITE

Before any work commences the exact positions of all services must be located and the services identified, marked and recorded on plan for inclusion in the as-built drawing.

Items have been allowed in the Bill of Quantities for dealing with and protecting existing services where they are known.

The Contractor, shall however, ensure that prior to construction all the necessary Record Drawings and Way-leaves for all services have been obtained and verified on site by the relevant service providers in his presence. The Contractor must request in writing the relevant official to indicate the said services within 48 hours prior to the commencement of the work, after which the responsibility rests with the service department if the services are not indicated to the Contractor as requested.

The Contractor shall take whatever extra precautions are required to protect all existing services from damage during the period of the Contract. Any damage to existing services indicated by the relevant service providers or other damage as a result thereof, shall be for the Contractors account.

C3.2.7 ASPECTS REQUIRING PARTICULAR ATTENTION

Refer to Clause C3.4.6

- Connection into existing services
- Protection of the environment
- Quality Assurance (QA)

C3.2.8 SERVICE CONDITIONS

All plant shall be designed for the climatic conditions pertaining to the service.

C3.2.9 DAMAGE TO BUILDINGS

The Contractor shall be held responsible at all time for all damage to the buildings and plant due to negligence of any of his workmen or that of his sub-Contractors. The Contractor at his cost shall repair any damage arising out of such negligence.

C3.2.10 SUPERVISION – ELECTRICAL

The work shall at all times, for the duration of the contract be carried out under the supervision of a skilled and competent representative of the Contractor who a Licenced Installation Electrician and who shall be able and authorised to receive and carry out instructions on behalf of the Contractor. A sufficient number of workmen shall be employed at all times to ensure satisfactory progress of the work

C3.2.11 PROVISION OF BUILDING WORKS FOR ELECTRICAL PLANT

The Contractor must supply full details of his requirements regarding work to be carried out by the Civil Contractor, including dimensions and positions of all openings, ducts etc., in walls and floors, and full particulars of all holding down bolts, cable holes for motors, etc. The Contractor shall supply all retaining devices like studs and bolts. Where a defect is found this shall be reported to the Engineer timeously so that corrective action can be taken. Under no circumstances shall delays and consequential cost be entertained due to the failure to ensure that the mountings are correct.

C3.2.12 BALANCING OF LOAD

The Contractor is required to balance the load as equally as possible over the multiphase supply.

C3.2.13**POWER SUPPLY**

The low voltage system is a 400-volt three phase, four wire, 50 Hz system with a maximum fault level of 6.5kA.

C3.3.1 PREFERENTIAL PROCUREMENT

C3.3.1.1 Requirements

Refer to Clause C.2.23.2 of the Tender Data and Form 1G: Form MBD 6: Preference Points Claim form in terms of the Preferential Procurement Regulations 2022 (80/20 version) of the Tender Data.

C3.3.1.2 Resources Standards pertaining to targeted procurement

Tenders will be evaluated in terms of the Employer's Procurement Points system. The criteria for allocation of procurement points are stated in Clauses C.3.11 of the Tender Data.

C3.3.2 SUBCONTRACTING

C3.3.2.1 Scope of mandatory subcontract works

The Contractor shall note that the Employer is committed to local Emerging Enterprise development and this forms part of this.

The sub-contracting of work is required for all CIDB-related projects in the following ranges:

- a) For any project < R 2.5M the Bidder may sub-contract what might be feasible
- b) R 2.5M >, but < R 5M requires Bidder to sub-contract 5% of the value of the project
- c) R 5M>, but < R 10M requires Bidder to sub-contract 10% of the value of the project
- d) R 10M >, but < R 15M requires Bidder to sub-contract 15% of the value of the project
- e) R 15 M>, but < R20 requires Bidder to sub-contract 20% of the value of the project
- f) R 20 M >, but < R 25M requires Bidder to sub-contract 25% of the value of the project
- g) R 30 > requires Bidder to sub-contract 30% of the value of the project to EMEs QSE. The feasible work packages for subcontracting must be identified by the Project Manager or appointed PSP prior to advertisement.

The sub-contracting value will be based on the estimated value of the project either determined by the director or project manager. Where the successful bidder's price falls within any other range, the sub-contracting range included in the Bid Document will be applied.

The municipality may include sub-contracting for any other none CIDB related project as may be requested by the Director of the Department to promote local development.

Community Based Suppliers or service providers/ward-based suppliers or service providers must be considered for subcontracting by the main contractor. The first preference for subcontracting must be given to community or ward-based suppliers of that particular ward where the project is taking place. If the required skill or expertise is not available from the ward / area where the project is taking place, the main contractor is permitted to accept service provers or suppliers within the KLM jurisdiction. Those service provider or suppliers would then contract directly with the main contractor.

It is the Employer's intention for the Contractor to enter in a subcontract with a local Emerging Enterprise/s, where twenty five percent (25%) of the work shall be subcontracted in accordance with the subcontracting procedures referred to in this scope of work who are registered with the CIDB with a Contractor Grading Designation of 1-3 in an appropriate class of construction work.

C3.3.2.2 Preferred subcontractors / suppliers

Local Emerging Enterprises registered on the Kouga Local Municipality Database and/or nominated by the municipality.

C3.3.2.3 Subcontracting procedures

All matters pertaining to subcontractors and the work executed by them shall be dealt with directly between the Employer's Agent and the Contractor in the context of all subcontract work being an integral part of the Works for which the Contractor is responsible.

Subcontractors shall comply in full to all aspects of the Contract.

The Employer's Agent will not liaise directly with any subcontractors nor will he issue instructions concerning the subcontract works directly to any subcontractor.

The Contractor shall remain responsible for providing the subcontracted portion of the works as if the work had not been subcontracted.

Subcontractors shall comply in full, to all aspects of the Contract.

C3.3.2.4 Attendance on subcontractors

The Contractor shall guide, assist, advise and mentor the local EE subcontractor/s and guidance on how to establish and determine rates.

The Contractor shall be responsible for ensuring that the prospective local EE subcontractor/s fully comprehend the:

- Implications of the liabilities and responsibilities inherent in the contract into which the tenderer entered.
- Implications of the tendered rates.
- Scope and extent of the Works.
- Proper procedures for the submission of a tender.
- Procedures and basis on which tenders will be evaluated and awarded.

The Contractor shall closely manage, mentor, supervise, guide and assist the EE in all aspects of management, planning, execution and the completion of work.

The above shall include inter alia, but is not limited to, the following:

- (i) Planning and programming of the Works.
- (ii) The sourcing, ordering, purchasing, hiring all the necessary Construction Equipment, Materials, tools and accidentals necessary and required for the successful execution and completion of the Permanent as well as the Temporary Works.
- (iii) Labour relations and employment.
- (iv) Monthly measurements, costing and invoicing.
- (v) General safety, occupational health and safety matters.
- (vi) Functions of civil engineering infrastructure, structures, services and systems.
- (vii) Interpreting and understanding the contract.
- (viii) Construction and maintenance methods and procedures.
- (ix) Communication.
- (x) Cash-flow control, submitting invoices and payment certificates.
- (xi) Planning, programming, scheduling, critical path control and acceleration.
- (xii) Maintenance planning.
- (xiii) Material procurement and control.
- (xiv) Risk limitation and management.
- (xv) Quality assurance and procedures.
- (xvi) Compliances with all applicable laws, regulations, statutory provisions and agreements.
- (xvii) General Conditions of Contract and Contract Data.
- (xviii) Contractual claims, if situations arise that entitle a contractor to claims in terms of the Conditions of Contract.
- (xix) Profit and loss.
- (xx) Replacement and running costs of Construction Equipment.

The extent and level of management, mentorship, supervision, guidance and assistance to be provided by the Contractor shall be in commensuration with the expertise of the relevant EE and should be so directed as to enable the EE to achieve the successful execution and completion of the respective works.

C3.3.3 SANCTIONS

In the event that the Tenderer fails to substantiate that any failure to achieve the Contract Participation Goal (CPG) outcomes was due to quantitative under runs, the elimination of items, or any other reasons beyond the Contractor's control which may be acceptable to the Employer, the Contractor shall be liable to pay to the Employer a financial penalty calculated in the following manner:

$$P = 0,50 \times \frac{(D-D_0)}{(100)} \times N_A$$

Where D = tendered Contractor participation goal percentage.

D₀ = the Contract Participation Goal, which the Employer's Representative based on the credits passed, certifies as being achieved upon completion of the contract.

N_A = Net Amount of the Tender

P = Rand value of penalty payable.

The penalties will be calculated with each certificate, based on the information provided under the monitoring indicated in clause C3.3.4 below.

C3.3.4 MONITORING / REPORTING

The reporting requirements below will be adhered to.

CPG attainment will be monitored on a monthly basis, and for this the Contractor will supply the relevant information at a time set by the Employer's Agent.

C3.3.4.1 The Contractor shall submit all the documentation required in terms of details of his plan to achieve CPG, compliance with the contract and C3.3.4.2 timeously and, together with his programme of activities, a schedule which indicates clearly the expected commencement and completion dates of work and services to be performed by all the targeted enterprises engaged on the contract for the purpose of securing credits towards the contract participation goal. This schedule shall be updated by the Contractor whenever a change in date occurs.

C3.3.4.2 The Contractor shall prepare and attach to his claim for payment, in a form approved by the Employer, the following:

a) a brief report which describes the commercially useful functions performed by the targeted enterprises in the performance of the contract, both over the interim period and on a cumulative basis;

b) a schedule reflecting the estimated total value of the contracts, the cumulative value of the contracts and the value of supplies provided or work and services performed (or both) over the period for which payment is claimed in respect of each and every targeted enterprise performing commercially useful functions;

C3.3.4.3 Should random inspections conducted by the Employer's Agent on targeted enterprise activities indicate that such enterprises are not performing in accordance with the requirements of this part, the Contractor shall provide, in addition to the requirements of C3.3.4.2, separate weekly resource returns and any other relevant information in respect of such targeted enterprises in a format approved by the Employer's Agent.

- C3.3.4.4 The Employer's Agent shall certify the value of the credits counted towards the contract participation goal whenever a claim for payment is issued to the employer and shall notify the Contractor of this amount.
- C3.3.4.5 The Contractor shall, upon completion of each individual targeted enterprise's contract, issue a completion certificate and certify the amount paid to such targeted enterprises. He shall submit the certificates, counter-certified by the relevant targeted enterprise, to the Employer's Agent for record-keeping purposes. The Contractor shall furnish reasons to the Employer whenever it is not possible to obtain such counter certification.

C3.3.5 CONTRACTOR'S OBLIGATIONS TO SUBCONTRACTED EEs

(1) Dispute Avoidance and Resolution Procedures

The Contractor shall at all times

- (a) apply the terms and conditions of the subcontract fairly and justly, taking due cognisance of the level of sophistication and experience of the EE subcontractor concerned.
- (b) closely monitor all EE subcontracts and issue reasonable warnings when any contravention of the terms of the subcontract has occurred or appears likely to occur. The Contractor shall give EEs reasonable opportunity to avoid or make good any such contravention.

When taking any disciplinary actions or imposing any penalties provided for in the subcontract, the Contractor shall explain fully that such actions are in accordance with the conditions of subcontract.

Should any dispute arise between the Contractor and an EE, such dispute shall be resolved in accordance with the provisions of the subcontract.

Should an EE subcontractor be terminated, the Contractor shall replace such subcontractor with a local EE subcontractor listed on the KLM database.

(2) Quality of Work and Performance of EE subcontractors

If, in the opinion of the Employer's Agent, an EE Subcontractor fails to comply with any of the criteria listed below, he/she shall issue a written warning to the Contractor stating all the areas of non-compliance.

- (a) Acceptable standard of work as set out in the subcontract specifications.
- (b) Progress in accordance with the time constraints in the subcontract.
- (c) Site safety.

The circumstances that may warrant the issue of a written warning are, however, not limited to those listed above.

A copy of the letter of warning shall be forwarded to the Employer.

C3.3.6 ISSUING OF COMPLETION CERTIFICATE

The Contractor shall, within 7 days of the completion of each subcontract completed in accordance with the provisions of this specification, issue free of charge to the EE a Certificate of Completion co-signed by the Employer's Agent and a senior representative of the Contractor who has been duly authorised to do so.

C3.3.7 MEASUREMENT AND PAYMENT

No direct payment will be made for the cost of dealing with EE's. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the contract.

C3.4.1 WORKS SPECIFICATION

C3.4.1.1 Applicable SANS standards

The applicable SABS 1200 Standardised Specifications for Civil Engineering Construction read in conjunction with the SABS 0120 Code of Practise for use with standardised specifications for Civil Engineering Construction and Contract Documents will apply until such time as the SANS standards for civil engineering are finalised.

C3.4.1.2 Other standards

Not applicable.

C3.4.1.3 Applicable national and international standards

For the purpose of this Contract the latest issues of the following Standardized Specifications for Civil Engineering Construction, applicable at the date of the tender advertisement shall apply:

SANS 1200 A – General
SANS 1200 AB – Employer’s Agents Office
SANS 1200 C – Site Clearance (As amended 1982)
SANS 1200 D – Earthworks (As amended 1990)
SANS 1200 DA – Earthworks (small works) (As amended 1990)
SANS 1200 DB – Earthworks (Pipe Trenches)
SANS 1200 DM – Earthworks (Road, Subgrade)
SANS 1200 GA – Concrete (Small Works)
SANS 1200 L – Medium Pressure Pipelines
SANS 1200 LB – Bedding (Pipes)
SANS 1200 LD – Sewers
SANS 1200 LE – Stormwater Drainage
SANS 1200 MK – Kerbing and channeling
SANS 1200 M – Roads (General)
SANS 1200 ME – Subbase
SANS 1200 MM – Ancillary Roadworks

Notes to tenderer:

1. Should any variation and/or addition conflict with the requirements of the standardized specification, the variation or addition will prevail.
2. The term “project specifications” appearing in any of the SANS1200 standardised specifications must be replaced with the term “scope of work”.
3. The General Conditions of Contract applicable to this contract are the “Conditions of Contract for Construction Works (3rd Edition) 2015” published by the South African Institute of Civil Engineering, together with the Special Conditions of Contract form part of the contract.
4. The terms “Schedule of Quantities”, (used throughout the Standard Specifications) and “Bill of Quantities”, (used in all other documents forming part of this contract), and “Pricing Schedule” are synonymous.

The variations and additions to the specifications are listed in C3.4.11.

In addition, the following Particular Specifications for work not covered by the SABS 1200 Standardized Specifications are also bound in the Scope of Work.

C3.4.1.4 Particular/Generic Specifications

The particular and/or generic specifications listed below are applicable to this contract. These specifications are also bound into this document.

PD	Health and Safety Specification
PAA	Appointment of CLO & Labour employment conditions
PA-PV	Building Specifications
PW	Electrical Specifications

C3.4.1.5 Certification by recognised bodies

Not applicable

C3.4.1.6 Agreement certificates

Not applicable.

C3.4.2 PLANT AND MATERIALS

C3.4.2.1 Plant and materials supplied by the employer

The Employer will not supply any plant or materials on this contract. The Contractor shall provide all plant and materials.

C3.4.2.2 Materials, samples and shop drawings

Materials or work, which does not conform to the approved samples submitted in terms of Clause 7.4 of the Conditions of Contract, will be rejected. The Employer's Agent reserves the right to submit samples to tests to ensure that the material represented by the sample meets the specification requirements.

The costs of any such test conducted by or on behalf of the Employer's Agent, the results of which indicate that the samples provided by the Contractor do not conform to the requirements of the Contract, shall, in accordance with the provisions of Clause 7.1 of the Conditions of Contract, be for the Contractor's account.

C3.4.3 CONSTRUCTION EQUIPMENT

C3.4.3.1 Requirements for equipment

All construction plant and equipment used on this contract shall be in good working order, well maintained, of adequate size and fit for purpose. No plant or equipment that leaks oil, fuel or hydraulic fluids may be used on site.

Any plant or equipment that, in the opinion of the Employer's Agent, is not of adequate size or fit for use shall be removed from the site and replaced with acceptable plant and equipment, all at the Contractor's cost.

C3.4.3.2 Equipment provided by the Employer

The Employer shall not supply any equipment.

C3.4.4 EXISTING SERVICES

The Contractor shall familiarize himself with all existing services and liaise with all relevant authorities for the location and detection of existing services. The Contractor shall also use all necessary means to locate and expose services without damage to such services. The Contractor shall protect any services which are visible or can be reasonably expected to be in certain positions. If the Employer's Agent rules that the Contractor has negligently damaged services, the Contractor shall pay the amount certified by the Employer's Agent to the Employer. The Employer's Agent ruling shall be final.

If the Employer's Agent rules that the damage was not due to the Contractor's negligence, the Employer shall pay for the repair of the services so damaged. The responsibility shall remain with the Contractor to establish the position of existing services prior to commencing any excavation.

C3.4.5 SITE ESTABLISHMENT

C3.4.5.1 Location of site camp and materials storage area

The Contractor shall establish his Site camp and materials storage area at a mutually acceptable location. Written confirmation of the owner's permission to occupy the chosen location shall also be issued to the Employer's Agent if it falls outside the bounds of the site.

The site of the camp must be kept clean and tidy, and on completion of the works the Contractor shall remove all temporary offices, sheds, etc. and shall reinstate the area to the Employer's Agent and/or the owner's satisfaction.

The Employer shall not provide any services to the site during construction.

C3.4.5.2 Water Supply

The Contractor shall make his own arrangements regarding the supply of water.

The Contractor shall, at his own expense, be responsible for obtaining and distributing all water as may be required for the purposes of executing the Contract, including water for both construction purposes and domestic use as well as for making all arrangements in connection therewith. The Contractor shall further, at his own expense, be responsible for providing all necessaries for procuring, storing, transporting and applying water required for the execution of the Contract, including but not limited to all piping, valves, tanks, pumps, meters and other plant and equipment, as well as for all work and superintendence associated therewith.

The Contractor shall make himself thoroughly acquainted with the regulations relating to the use of water and shall take adequate measures to prevent the wastage of water.

The sources of all water utilised for the purposes of the Contract shall be subject to the prior approval of the Employer's Agent, which approval shall not be unreasonably withheld. The Contractor shall comply with all prevailing legislation in respect of drawing water from natural and other sources and shall, when required by the Employer's Agent, produce proof of such compliance.

The distribution of water shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations. All water provided by the Contractor for construction purposes shall be clean, free from undesirable concentrations of deleterious salts and other materials and shall comply with any further relevant specifications of the Contract.

The Contractor shall, whenever reasonably required by the Employer's Agent, produce test results demonstrating such compliance. Water provided by the Contractor for human consumption shall be healthy and potable to the satisfaction of the health authorities in the area of the Site.

The Employer accepts no responsibility for the shortage of water due to any cause whatsoever or for the additional costs incurred by the Contractor as a result of such shortage.

The Contractor shall take note that no separate or direct payment of any kind whatsoever will be made for any cost incurred to obtain, distribute, consume and use water or for the provision of a water supply point or for the cost of water drawn. Payment for the aforementioned shall be deemed to be covered by the rates and prices tendered and paid for the various items of work included under the Contract.

C3.4.5.3 Power / Electricity Supply

The Contractor shall make his own arrangements with the Electricity Department for a supply of electricity if required and shall pay establishment and consumption costs at the tariffs ruling at the time.

The Contractor shall, at his own expense, be responsible for obtaining and distributing all electricity as he may require for the purposes of executing the Contract, including electricity for both construction purposes and domestic use as well as for making all arrangements in connection therewith.

The distribution of electricity shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations. No separate payment will be made to the Contractor for the obtainment, distribution and consumption of electricity, the costs of which will be deemed to be in the Contractor's tendered rates and prices.

C3.4.5.4 Sanitary facilities

The Contractor shall, at his own expense, be responsible for safely and hygienically dealing with and disposing of all human excrement and similar matter generated on the Site during the course of the Contract, all to the satisfaction of the responsible health authorities in the area of the Site as well as the Employer's Agent.

All such excrement shall be removed from the Site and shall not be disposed of by the Contractor on the Site. The Contractor shall further comply with any other requirements in this regard as may be stated in the Contract.

The Contractor shall further, as a minimum, supply and maintain chemical toilets for use by his workmen. The number of toilets shall be based on one toilet per fifteen personnel on site.

Under no circumstances will the Contractor's staff be allowed to use any other toilet facilities in and around the Site.

C3.4.5.5 Accommodation of employees

The Contractor shall make his own arrangements for the accommodation of his employees. Where field accommodation is required, the Contractor shall comply fully with the wishes of the various landowners, as in their agreement with the Employer, to the satisfaction of both land owner and Employer.

C3.4.6 SITE USAGE

Access to site shall be limited to the Contractor and his personnel. The Contractor shall be responsible to control unauthorized entry to the site and shall inform the Employer's Agent of any breach of such rules. The site shall be managed and used for its intended purpose. The Contractor is required to keep a visitors log, and ensure full compliance with site safety standards.

C3.4.7 PERMITS AND WAY LEAVES

The Contractor will be required to take cognisance and comply with the general wayleave requirements of the various service providers, where applicable, during the contract period. The Contractor is to liaise with the Employer's Agent to establish who they require to make contact with prior to commencement of the Works. The following Departments would need to be contacted,

1. Kouga Technical Directorate
2. Eskom
3. Any other service provider

C3.4.8 FACILITIES PROVIDED BY THE CONTRACTOR

C3.4.8.1 Office for the Employer's Agent

A separate office for the Employer's Agent is not required. The Contractor shall provide a table or desk and chair in his own office for use by the Employer's Agent.

Site meetings will be held in the Contractor's office or any other agreed upon venue, which must be big enough and have sufficient seating for this purpose.

C3.4.8.2 Sanitary facilities

No latrines are available and therefore the Contractor shall supply portable chemical toilets for use by his workmen. The number of toilets shall be based on one toilet per fifteen personnel on site. Under no circumstances will the Contractor's staff be allowed to use private or public toilet facilities.

The Contractor shall provide water and soap for his staff to be able to wash with at each site of the Works. The wastewater shall be disposed of off-site.

C3.4.8.3 Security on site

The Contractor shall make provision for security on site against theft and robbery, as his sole responsibility. The cost for providing adequate security, as and when required, must be borne by the Contractor.

C3.4.9 FEATURES REQUIRING SPECIAL ATTENTION

C3.4.9.1 Site maintenance

During progress of the work and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store materials and equipment for which he is responsible in an orderly manner and shall keep the Site free from debris and obstructions.

C3.4.9.2 Access to properties (where relevant)

The Contractor shall organise the work to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the work, and except as hereunder provided, shall at all times provide and allow pedestrian and vehicular access to properties within or adjoining or affected by the area in which he is working. In this respect the Contractor's attention is drawn to Clause 8.1.1 of the Conditions of Contract.

Where applicable and if as a result of restricted road reserve widths and the nature of the work, the construction of bypasses is not feasible, construction shall be carried out under traffic conditions to provide access to erven and properties.

Notwithstanding the above, the Contractor may, with the prior approval of the Employer's Agent (which approval shall not be unreasonably withheld), make arrangements with and obtain the acceptance of the occupiers of erven and properties to close off part of a street, road, footpath or entrance temporarily, provided that the Contractor duly notifies the occupiers of the intended closure and its probable duration, and reopens the route as punctually as possible. Where possible, such streets, roads, footpaths and entrances shall be made safe and reopened to traffic overnight. Such closure shall not absolve the Contractor from his obligations under the Contract to provide access at all times. Barricades, traffic signs, drums and other safety measures appropriate to the circumstances shall be provided by the Contractor to suit the specific conditions.

C3.4.9.3 Monthly statements and payment certificates

The statement to be submitted by the Contractor in terms of Clause 6.10 of the Conditions of Contract shall be prepared by the Contractor at his own cost, strictly in accordance with the standard payment certificate prescribed by the Employer's Agent, in digital electronic computer format. The Contractor shall, together with a copy of the digital electronic computer file of the statement, submit two (2) A4 size paper copies of the statement.

For the purposes of the Employer's Agent payment certificate, the Contractor shall subsequently be responsible, at his own cost, for making such adjustments to his statement as may be required by the Employer's Agent for the purposes of accurately reflecting the actual quantities and amounts which the Employer's Agent deems to be due and payable to the Contractor in the payment certificate.

The Contractor shall, at his own cost, make the said adjustments to the statement and return it to the Employer's Agent within three (3) normal working days from the date on which the Employer's Agent communicated to the Contractor the adjustments required. The Contractor shall submit to the Employer's Agent five (5) sets of A4 size paper copies of such adjusted statement, together with a copy of the electronic digital computer file thereof.

Any delay by the Contractor in making the said adjustments and submitting to the Employer's Agent the requisite copies of the adjusted statement for the purposes of the Employer's Agent payment certificate will be added to the times allowed to the Employer's Agent in terms of Clause 6.10.4 of the Conditions of Contract to submit the signed payment certificate to the Employer and the Contractor. Any such delay will also be added to the period in which the Employer is required to make payment to the Contractor.

C3.4.9.4 Notices, signs, barricades and advertisements

All notices, signs and barricades, as well as advertisements, may be used only if approved by the Employer's Agent. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Employer's Agent shall have the right to instruct the Contractor to move any sign, notice or advertisement to another position, or to remove it from the Site of the Works if in his opinion it is unsatisfactory, inconvenient or dangerous.

C3.4.9.5 Workmanship and quality control

The Employer, the Contractor and the Employer's Agent shall operate and maintain their own individual contract administration and quality assurance systems.

The Contractor shall implement his own Quality Assurance plan for executing the works for compliance with the aforementioned standards and specifications.

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality control system and provide suitably qualified and experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times.

The cost of supervision and process control, including testing and mix designs carried out by the Contractor, will be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various Standardized Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control.

On completion and submission of every part of the work to the Employer's Agent for examination and measurement, the Contractor shall furnish the Employer's Agent with the results of the relevant tests, mix designs, measurements and levels to demonstrate the achievement of compliance with the Specifications.

i. Contractor to engage services of an independent laboratory.

Notwithstanding the requirements of the Specifications pertaining to testing and quality control, the Contractor shall engage the services of an approved independent laboratory to undertake all testing of materials, the results of which are specified in, or may reasonably be inferred from, the Contract. These results will be taken into consideration by the Employer's Agent in deciding whether the quality of materials utilised and workmanship achieved by the Contractor comply with the requirements of the Specifications. The foregoing shall apply irrespective of whether the specifications indicate that the said testing is to be carried out by the Employer's Agent or by the Contractor.

The Contractor shall be responsible for arranging with the independent testing laboratory for the timeous carrying out of all such testing specified in the Contract, at not less than the frequencies and in the manner specified. The Contractor shall promptly provide the Employer's Agent with copies of the results of all such testing carried out by the independent laboratory.

For the purposes of this clause, an "independent laboratory" shall mean an "approved laboratory" (as defined in subclause PSA 7.2) which is not under the management or control of the Contractor and in which the Contractor has no financial interest, nor which has any control or financial interest in the Contractor.

ii. Additional testing required by the Employer's Agent

In addition to the provisions of subclause C3.4.9.5 (i): Contractor to engage services of an independent laboratory, the Employer's Agent shall be entitled at times during the Contract to require that the Contractor arrange with the independent laboratory to carry out any such tests, additional to those described in subclause C3.4.9.5 (i), at such times and at such locations in the Works as the Employer's Agent shall prescribe. The Contractor shall promptly and without delay arrange with the independent laboratory for carrying out all such additional testing as required by the Employer's Agent, and copies of the test results shall be promptly submitted to the Employer's Agent.

iii. Costs of testing

(a) Tests in terms of subclause C3.4.9.5 (i)

The costs of all testing carried out by the independent laboratory in accordance with the requirements of subclause C3.4.9.5 (i), above shall be borne by the Contractor and shall be deemed to be included in the tendered rates and prices for the respective items of work as listed in the Bill of Quantities and which require testing in terms of the Specifications. No separate payments will be made by the Employer to the Contractor in respect of any testing carried out in terms of subclause C3.4.9.5 (i).

Where, as a result of the consistency of the materials varying or as a result of failure to meet the required specifications for the work, it becomes necessary to carry out additional tests (e.g. re-tests on rectified work and/or replacement materials), the costs of such additional testing shall be for the Contractor's account.

(b) Additional tests required by the Employer's Agent

The costs of any additional tests required by the Employer's Agent in terms of subclause C3.4.9.5 (i) Additional testing required by the Employer's Agent, shall be reimbursed to the Contractor against substitution of the Provisional Sum allowed therefore in the Bill of Quantities; provided always that the costs of any such additional tests ordered by the Employer's Agent, the results of which indicate that the quality of the materials utilised and/or the standard of workmanship achieved are/is not in accordance with the specifications, shall not be reimbursable to the Contractor.

C3.4.9.6 Public Safety

The Contractor shall at all times ensure that his operations do not endanger any member of the public.

As the area is adjacent to a residential area the Contractor shall take special precautions to prevent public access to any danger areas on the Works, e.g. by temporary barricades and/or fencing.

C3.4.9.7 Sand and Dust Control

The Contractor shall, for the duration of the contract, take appropriate measures to control the dust and soil movement which may arise due to his operations.

C3.4.9.8 Employment of local labour

It is the intention that this Contract should make maximum use of the local labour force that is presently under-employed. To this end the Contractor shall limit the utilisation on the Contract of non-local employees to that of key personnel only and to employ and train local labour to the extent necessary for the execution and completion of this Contract.

The Contractor shall fill in the form entitled Key Personnel in the Forms to be completed by the Tenderer. The data stated on the above-mentioned form will be strictly monitored during the Contract period and any deviations therefrom shall be subject to the prior approval of the Employer's Agent, which approval shall not be unreasonably withheld.

C3.4.10 EXTENSION OF TIME DUE TO ABNORMAL RAINFALL

A claim for extension of time in respect of delays suffered by the Contractor in consequence of abnormal wet climatic conditions will be considered by the Employer's Agent in terms of Clause 5.12 of the Conditions of Contract and in accordance with provisions set out hereunder.

For the purposes of extension of time, a delay caused by abnormal wet climatic conditions will be regarded as a delay only if, in the opinion of the Employer's Agent, all progress on an item or items of work on the critical path of the Contractor's working programme as approved in terms of Clause 5.6 of the Conditions of Contract has been brought to a halt.

Unless it is customary to carry out the work, in respect of which a delay was suffered, by rotary shifts or by day and by night, only delays to critical path items experienced as a result of wet climatic conditions during normal working hours (as defined in Clause 5.8 of the Conditions of Contract) will be taken into account for extension of time. This will apply notwithstanding the fact that a delay may have occurred on a portion of the Works on the critical path due to wet climatic conditions, which work was being executed outside the said normal hours with the permission of the Employer's Agent, granted in terms of Clause 5.8 of the Conditions of Contract.

The Contractor shall make due allowance within his programme submitted in terms of Clause 5.6 of the Conditions of Contract, for the total delay to work items on the critical path resulting from normal wet climatic conditions. The specified allowances for this Contract are defined in Clauses 24-26 of the Contract Data.

Extension of time, if granted by the Employer's Agent, will be determined as the aggregate number of normal working hours for which all progress on the item or items on the critical path was brought to a halt as a result of wet climatic conditions, less the number of normal working days specified in Clause 5.12 of the Contract Data.

In determining the revised Due Completion Date of the Contract, the Employer's Agent shall add the equivalent number of normal working days delay determined in accordance with this Clause and all intervening normal non-working days to the prevailing Due Completion Date.

C3.4.11 VARIATIONS AND ADDITIONS TO SABS 1200 STANDARDIZED SPECIFICATIONS AND PARTICULAR SPECIFICATIONS

The following variations and additions to the SABS 1200 Standardized Specifications referred to shall apply to this Contract (full specifications added below):

- PSA - GENERAL
- PSC - SITE CLEARANCE
- PSDB - EARTHWORKS (PIPE TRENCHES)
- PSGA – CONCRETE (SMALL WORKS)
- PSL - MEDIUM PRESSURE PIPELINES
- PSLB - BEDDING (PIPES)
- PSLK - VALVE INSTALLATIONS. (SPEC LK)
- PSME - SUBBASE

The prefix "PS" indicates an amendment to SABS 1200. The prefix "PSA" indicates an amendment to SABS 1200 A, "PSDB" to SABS 1200 DB and so on. The letters and numbers following these prefixes respectively indicate the relevant Standardized Specification and clause numbers in SABS 1200 to which the variation or addition thereto applies.

An asterisk (*) placed next to a PS Subclause number denotes the inclusion of an additional Subclause for which no equivalent appears in SABS 1200.

The term "project specifications" appearing in any of the SABS 1200 Standardized specifications must be replaced with the term "Scope of Work".

Further to the above it should be noted that where in a specific Standardized Specification reference is made to a Subclause in another Standardized Specification, any amendment or addition to the Subclause referred to, as provided for in the Specification, shall apply. The aforementioned shall also apply with respect to Clauses referred to in a Particular Specification.

C3.4.12 ALTERATIONS, ADDITIONS, EXTENSIONS AND MODIFICATIONS TO EXISTING WORKS

It is the Contractor's responsibility to satisfy himself that the dimensional accuracy, alignment, levels and setting out of existing structures or components are compatible with the proposed works before construction

commences. Should this not be the case, the Contractor is to notify the Client's representative as soon as possible and no claims will be entertained as a result of the incompatibility of the proposed works.

C3.4.13 WATER FOR CONSTRUCTION PURPOSES

With the exception of the first test, water for cleaning and testing is to be provided by the contractor. Sufficient water is to be made available by the Contractor for the testing of all the elements that require cleaning, testing and disinfection of the works.

C3.4.14 SURVEY CONTROL AND SETTING OUT OF THE WORKS

Before commencement of the work, the Contractor is to liaise with the Employer's Agent to establish the exact status of all pegs and servitudes in the area. The position of all erf pegs found will be recorded on a marked up print of the area.

On completion of the Contract the pegs that have unavoidably disturbed will be replaced by the Employer. Pegs which have, in the opinion of the Employer's Agent, been disturbed due to the negligence of the Contractor, will be replaced at the Contractor's cost.

Benchmarks with levels and co-ordinates are available on site. Setting out will be done using co-ordinates supplied by the Employer's Agent.

C3.4.15 DAMAGE TO SERVICES

The Contractor shall so carry out all his operations as not to encroach on, or interfere with, trespass on, or damage adjoining lands, buildings, properties, road structures, pipelines, places and things, in the vicinity of the Works and so as not to interfere in any way at any time with the smooth and continuous operation of the existing facilities.

C3.4.16 REINSTATEMENT OF SERVICES AND STRUCTURE DAMAGED DURING CONSTRUCTION

All repairs will be done to the standard of the service before the damage was incurred. Where owners of existing services may elect to repair damages themselves, the contractor will still remain liable for any claims that the owners of the service may make to compensate for the costs involved.

C3.4.17 EXCLUSIONS

- Supply and installation of pump-motor sets, mechanical equipment, cranes, piping, valves; and
- Civil, structural and building work except where sleeves are required underneath roadways

C3.4.18 STORAGE

The Contractor must provide adequate and secure storage, to the satisfaction of the Engineer, for all materials. All material must, in addition be stored or stacked in positions that shall not interfere with other work in progress in the area.

C3.4.19 BOLTS, NUTS, WASHERS, BRACKETS AND MOUNTING ACCESSORIES

All bolts, nuts washers, fixing and mounting accessories shall be manufactured from galvanised steel. Should accessories manufactured from mild steel or any other corrosive material be used on site, the Engineer shall instruct the Contractor to remove such accessories and replace them at the Contractors expense.

C3.4.20 SERVICE AND FACILITIES PROVIDED BY THE EMPLOYER

Source of Water Supply

The Contractor may make application to the Municipality's Water Division for a water supply point, and shall bear all the costs for the installation of such supply point. Water used by the Contractor from the Employer's mains will be charged for at the tariffs ruling at the time of use. A raw water supply point is available at the Howiesonspoot pumpstation.

The Contractor shall make himself thoroughly acquainted with the regulations relating to the use of water and shall take adequate measures to prevent the wastage of water.

The Employer accepts no responsibility for the shortage of water due to any cause whatsoever, nor additional costs incurred by the Contractor as a result of such shortage.

The Contractor shall take note that no direct payment will be made for any costs incurred for the provision of a water supply point nor for the cost of water drawn. Payment for the aforementioned shall be deemed to be covered by the rates and prices tendered and paid for the various items of work included under the Contract.

Source of Power Supply

The Contractor is to make his own arrangements with the Electricity Department for a supply of electricity, if required, and shall pay establishment and consumption costs at the tariffs ruling at the time.

Location of Camp and Materials storage area

The camp site and storage area will be indicated to tenderers at the site inspection for the contract.

The Contractor shall confine his camp and storage of materials to the areas designated. On completion of the construction works the surface of the areas utilised shall be re-instated.

C3.4.21 NOTICE BOARDS

The contract nameboard required shall be as detailed on the nameboard drawing bound into the back of this document.

PSA GENERAL

PSA 1 SCOPE

Replace the contents of Clause 1.1, including the notes, with the following:

"1.1 This specification covers requirements, principles and responsibilities of a general nature which are generally applicable to civil engineering construction and building works contracts, as well as the requirements for the Contractor's establishment on the Site."

PSA 2 INTERPRETATIONS

PSA 2.3 DEFINITIONS

In the opening phrase, insert the words: "the definitions given in the Conditions of Contract and" between the words "specification" and "the following".

a) General

Add the following definitions:

General Conditions and Conditions of Contract. The General Conditions of Contract specified for use with this Contract as amended in the Contract Data.

Specified As specified in the Standardized Specifications, the Drawings or the Scope of Work. "Specifications" shall have the corresponding meaning."

c) Measurement and payment

Replace the definitions for "Fixed charge", "Time-related charge" and "Value-related charge" with the following:

Fixed charge. A charge that is not subject to adjustment on account of variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work.

Time-related charge. A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract.

Value-related charge. A charge, the amount of which varies pro rata with the final value of the measured work executed and valued in accordance with the provisions of the Contract."

PSA 2.4 ABBREVIATIONS

a) Abbreviations relating to standard documents

Add the following abbreviation:

"CKS: SABS Co-ordinating Specification."

PSA 3 MATERIALS

PSA 3.1 QUALITY

Where applicable, materials shall bear an official standardization mark.

Add the following:

"Where proprietary materials are specified it is to indicate the quality or type of materials or articles required, and where the terms "or similar approved" or "or approved equivalent" are used in connection with proprietary materials or articles, it is to be understood that the approval shall be at the sole discretion of the Employer's Agent."

“PSA 3.3* ORDERING OF MATERIALS

The quantities set out in the Bill of Quantities have been carefully determined from calculations based on data available at the time of its compilation, but are to be considered as approximate quantities only. Before ordering materials of any kind the Contractor shall be solely responsible for determining, from the Drawings issued or approved by the Employer’s Agent for construction purposes, the actual quantities of materials required for the execution of the Works. No liability or responsibility whatsoever shall be attached to the Employer or the Employer’s Agent in respect of materials ordered by the Contractor except when ordered in accordance with the Drawings issued or approved by the Employer’s Agent for construction purposes.”

PSA 4 PLANT

PSA 4.1 SILENCING OF PLANT

Replace the contents of Clause 4.1 with the following:

“The Contractor’s attention is drawn to the applicable regulations pertaining to noise and hearing conservation, framed under the Occupational Health and Safety Act (Act No. 85 of 1993) as amended.

The Contractor shall at all times and at its own cost, be responsible for implementing all necessary steps to ensure full compliance with such regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other Plant which would otherwise cause a noise level in excess of that specified in the said regulations.

Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise in order to comply with the said regulations.”

PSA 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES

Add the following new paragraph before the existing paragraph in Clause 4.2:

"The Contractor’s buildings, sheds and other facilities erected or utilised on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition.

No personnel may reside on the Site. Only night-watchmen may be on the Site after hours."

Delete “and first-aid services” in the second paragraph of Clause 4.2 and add the following:

"The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 15 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil."

PSA 5 CONSTRUCTION

PSA 5.1 SURVEY

PSA 5.1.1 Setting out of the Works

The installed benchmarks shown on the Drawings shall be used by the Contractor for setting out the works.
Add the following paragraph:

"The Contractor shall be required to check and verify, prior to commencement of any construction work, all benchmarks and boundary reference pegs, as shown and detailed on the Drawings. Reference and benchmark pegs disturbed and/or removed during the construction period shall be replaced by a Professional Land Surveyor and the Contractor shall bear the cost of such replacement. Payment to check and verify the reference and benchmark pegs will be made in terms of PSA 8.8.5."

PSA 5.1.2 Preservation and replacement of survey beacons and pegs subject to the Land Survey Act

Delete from the second sentence "Before the commencement . . . "to" . . . apparently in their correct positions" and replace with the following:

"Immediately on taking over the site, the Contractor, in consultation and liaison with the Employer's Agent, shall search for all pegs and the Contractor shall compile a list of pegs that are apparently in their correct position."

Replace the third sentence of Clause 5.1.2 with the following:

"At completion of the Contract, the Contractor shall expose and mark all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor the replacement of pegs that have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Employer's Agent, a certificate from the Registered Land Surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this Clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act.

The costs of replacement and certification as aforesaid shall be entirely for the Contractor's account, provided always that the Contractor shall not be held liable for the cost of replacement of pegs which:

- (a) cannot reasonably be re-established in their original positions by reason of the finished dimensions of the Permanent Works ; and
- (b) the Contractor can prove beyond reasonable doubt and to the satisfaction of the Employer's Agent, were disturbed, damaged or destroyed by others beyond its control, and
- (c) were in close proximity to the work and which would unavoidably be removed, subject to the Employer's Agent approval being given to remove such pegs."

PSA 5.2 WATCHING, BARRICADING AND LIGHTING AND TRAFFIC CROSSINGS

Add the following:

"The Contractor shall comply in all aspects with the requirements of the Occupational Health and Safety Act (Act 85 of 1993), refer also PSA 5.7, PSA 5.9 and PSA 5.10."

PSA 5.3 PROTECTION OF STRUCTURES

Replace: "Machinery and Occupational Safety Act, 1983, (Act No. 6 of 1983)" with: "Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), as amended," and insert the following after "(Act No. 27 of 1956)": "as amended".

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

Replace the heading and the contents of Clause 5.4 with the following:

"PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of existing services

Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent Contractor to be present on, under, over or within the Site.

Without in any way limiting its liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Employer's Agent, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where it intends to work.

Neither the Employer nor the Employer's Agent offer any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such

plans by means of careful inspection of the Site. No excavation may commence until the position of the service at the crossing point has been marked out and verified by an official of the responsible authority.

Thereafter, the Contractor shall, by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Employer's Agent, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the requirements of Clauses 4.4 and 5.1.2.2 of SABS 1200 D (as amended) shall also apply.

The aforesaid procedure shall also be followed in respect of services not shown on the plans but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the Site.

All services, the positions of which have been determined as aforesaid at critical points, shall henceforth be designated as "Known Services" and their positions shall be indicated by the Contractor on a separate set of Drawings, a copy of which shall be furnished to the Employer's Agent without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the Site, it shall henceforth be deemed to be a "Known Service" and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the Site shall apply. The Contractor shall notify the Employer's Agent immediately should any such service be encountered or discovered on the Site.

Whilst it is in possession of the Site, the Contractor shall be liable for all loss of or damage as may occur to:

- (a) Known Services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognisance being taken of such deviations in line and level which may reasonably be anticipated; and
- (b) any other service which ought reasonably to have been a Known Service in accordance with the provisions of this Clause;

as well as for consequential damage, whether caused directly by the Contractor's operations or by the lack of proper protection; provided always that the Contractor will not be held liable in respect of damages occurring to services not being Known Services.

No separate payment will be made to the Contractor in respect of any costs incurred in preparing and submitting to the Employer's Agent, the Drawings as aforesaid and these costs shall be deemed included in the Contractor's other tendered rates and prices included in the Contract.

Payment to the Contractor's in respect of exposing services at the positions agreed by the Employer's Agent and as described above will be made under the payment items (if any) as may be provided therefore in the respective sections of the Specifications pertaining to the type of work involved.

PSA 5.4.2 Protection during construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all known services during the period which the Contractor has occupation and/or possession of the Site.

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising therefrom to the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified in the Contract or ordered by the Employer's Agent, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Employer's Agent, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services, the Contractor shall immediately inform the Employer's Agent, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service.

No repairs of telecommunication cables or electric power lines and cables shall be attempted by the Contractor, unless approved by the Employer's Agent.

The Employer will accept no liability for damages due to a delay in having alterations or repairs effected by the respective service owners. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services."

PSA 5.7 SAFETY

Replace the contents of subclause 5.7 with the following:

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations there under, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

- (a) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational Health and Safety Act (Act No 85 of 1993) and associated Regulations as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times; and
- (b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public; and
- (c) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the Act at all times; and
- (d) Implement all necessary measures so as to ensure compliance with the Act by all subcontractors engaged by the Contractor and their employees engaged on the works; and
- (e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer shall in terms of the Regulations make such inspections on the site, as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act. For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Employer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Employer's Agent shall, in accordance with the provisions of Clause 5.11.2 of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Employer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Employer's Agent in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Clause 5.13 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Employer's Agent to act in terms of Clause 9.2 of the Conditions of Contract and for the Employer to terminate the Contract in accordance with the further provisions of the said Clause 9.2."

"PSA 5.9* MAINTAINING SERVICES IN USE

The Contractor shall take note that he shall not cut off any service in use without the prior approval of the Employer's Agent.

Failure on the part of the Contractor to comply with any of the above provisions will constitute sufficient reason for the Employer's Agent to stop the works until the situation has been remedied, or should he deem it necessary, arrange for the situation to be remedied at the Contractor's cost.

No direct payment will be made for the cost of maintaining services in use. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract."

"PSA 5.10* DEALING WITH AND ACCOMMODATING TRAFFIC

The Contractor shall take note that the existing roads and tracks within and to the Sites, shall remain operational throughout the contract period. To this end the Contractor shall provide and maintain all temporary fences, security, barriers, kerb ramps, signs, markings, flagmen, drums, lighting, personnel and all other incidentals necessary to ensure safe and easy passage of all traffic.

Temporary traffic signs etc. as well as all necessary markings shall be erected and maintained by the Contractor and the number and layout of the traffic signs shall comply with the Site Manual entitled "Safety at Roadworks in Urban Areas", as published by the Department of Transport.

Traffic signs shall have a yellow background with either a red / black border.

No direct payment will be made for the cost of dealing with and accommodating traffic. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the contract. Further, the provision of PSA 5.2 shall apply."

"PSA 5.11* SITE MEETINGS

The Contractor or its authorised agent will be required to attend regular site meetings, which shall normally be held once a month on dates and at times determined by the Employer's Agent, but in any case whenever reasonably required by the Employer's Agent. Unless otherwise indicated in the Contract or instructed by the Employer's Agent, such meetings shall be held at the Contractor's offices on the Site. At such monthly meetings, matters such as general progress on the Works, quality of work, problems, claims, payments, and safety etc., shall be discussed, but not matters concerning the day-to-day running of the Contract.

"PSA 5.12* PROVIDING ACCESS TO ERVEN AND PROPERTIES

Access to erven and properties along the route of trenches and roads shall be provided by the Contractor at all times. To this end suitable crossings shall be constructed where required.

Temporary crossings shall be in the form of portable bridges, temporary backfill or other approved means and shall be capable of permitting the safe passage of all vehicles and pedestrians. The Contractor shall also be responsible for maintaining crossings and for removing same when they are no longer required.

If as a result of restricted road reserve widths and the nature of the Works the construction of bypasses is not feasible, construction shall be carried out under traffic in order to provide access to the properties.

The Contractor may, with the approval of the Employer's Agent, arrange with the occupiers of the affected properties to temporarily close off a portion of a road, footpath entrance, property access road or other access, provided that the Contractor shall give due notice of the intended closure and its probable duration to the occupiers and shall as punctually as possible re-open the route at the prescribed time. Where possible, roads shall be made safe and re-opened to traffic overnight. Any such closure shall be an arrangement between the Contractor and the occupiers and shall not absolve the Contractor from his obligations under the Contract to provide access at all times. Barricades, traffic signs and drums shall be provided by the Contractor to suit the specific conditions.

No direct payment will be made for the cost of providing access. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract."

"PSA 5.14* PROTECTION OF LIVESTOCK

From the time of the occupancy of the Site until the date of the Completion Certificate the Contractor shall take all measures necessary for the protection and control of livestock on the sections of the properties affected by his operations. He shall provide gates in existing fences cut by him for the purpose of access and control, and where necessary, to store materials and plant and the Contractor shall ensure that all gates are kept closed during such time as they are not actually in use by his traffic.

Where the Contractor cannot make alternative arrangements, the Contractor shall erect temporary fencing where necessary to protect livestock exposed to straying through his operations. The fencing shall be maintained in good order during construction operations and on completion of the work it shall be removed from the Site and all surfaces restored to the satisfaction of the property owner.

Payment for the protection of livestock, including the erection of temporary fences and gates where required, shall be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract.

Claims by property owners for loss of or injury to livestock due to negligence on the part of the Contractor, shall be settled by the Contractor.”

“PSA 5.15* ENVIRONMENTAL MANAGEMENT PLAN, RECORD OF DECISION AND SPECIFICATIONS

The Contractor shall be required to comply with the Environmental Management Plan (EMP), Record of Decision (ROD) and Specifications during the Contract period.

Non-compliance with the specifications, ROD and EMP, in any way whatsoever, will be adequate reason for suspension of the Works.

The Contractor shall at all times be responsible for full compliance with the specifications, ROD and EMP and no extension of time will be considered for delays due to non-compliance with the abovementioned.

No direct payment will be made for the cost of complying with the EMP or disruption experienced in attending to the aforementioned. Payment shall be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract.”

“PSA 5.16* ATTENDANCE ON EE’S

The Contractor shall closely manage and supervise all EE’s and shall manage, guide and assist each EE in all aspects of management, execution and completion of his subcontract. This shall typically include assistance with planning his works, sourcing and ordering of materials, labour relations, monthly measurements and invoicing procedures, etc. The extent and level of such management, guidance and assistance, to be provided by the Contractor shall be commensurate with the expertise of relevant EE and shall be directed at enabling the EE’s to achieve the successful execution and completion of the subcontract. No direct payment will be made for the cost of attendance on EE’s. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the contract.”

PSA 6 TOLERANCES

“PSA 6.4* USE OF TOLERANCES

No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified, or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorized' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Employer’s Agent, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorized' dimensions.

If the work is constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the calculation of quantities will be based on the 'authorised' dimensions, regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Employer’s Agent may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual

dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed."

PSA 7 TESTING

PSA 7.1 PRINCIPLES

PSA 7.1.2 Standard of Finished Work Not to Specification

Insert the words "or checks by an approved laboratory ..." after the words "Where the Employer's Agent checks ..." in the first line of Clause 7.1.2.

PSA 7.2 APPROVED LABORATORIES

Replace the contents of Clause 7.2 with the following:

"Unless otherwise specified in the relevant specification or elsewhere in the Scope of Work, the following shall be deemed to be approved laboratories in which design work, or testing required in terms of a specification for the purposes of acceptance by the Employer's Agent of the quality of materials used and/or workmanship achieved, may be carried out:

- (a) any testing laboratory certified by the South African National Accreditation Systems (SANAS) in respect of the nature and type of testing to be undertaken for the purposes of the Contract;
- (b) any testing laboratory owned, managed or operated by the Employer or the Employer's Agent;
- (c) any testing laboratory established and operated on the Site by or on behalf of the Employer or the Employer's Agent;
- (d) any testing laboratory designated by the Employer's Agent."

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 MEASUREMENT

PSA 8.1.1 Method of measurement, all sections of the Schedule

Delete the words "and South West Africa".

PSA 8.1.2 Preliminary and General item or section

PSA 8.1.2.1 Contents

Replace the contents of item (c) with the following:

"The 'duration of construction' applicable to a time-related item shall be the tendered contract period for the total works assignment, plus as applicable, the Civil Engineering Industry Holiday (Dec / Jan) and all gazetted public holidays for the Civil Engineering Industry."

PSA 8.1.2.2 Tendered sums

Replace the contents of this Subclause with the following:

"Except only where specific provision is made in the Specifications and/or the Bill of Quantities for separate compensation for any of these items, the Contractor's tendered sums under items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification; and
- head-office and site overheads and supervision; and
- profit and financing costs; and
- expenses of a general nature not specifically related to any item or items of the permanent or temporary work; and

- providing such facilities on site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, services such as water, electricity, sewage and rubbish disposal, access roads and all other facilities required, as well as for the maintenance and removal on completion of the works of these facilities and cleaning-up of the site of the Contractor's establishment and reinstatement to not less than its original condition, and
- providing the facilities for the Employer's Agent and his staff as specified in the Contract and their removal from the site on completion of the Contract.
- Completion of monthly reporting/monitoring of Emerging Enterprise Subcontract."

PSA 8.2 PAYMENT

PSA 8.2.2 Time-related items

Replace the contents of Clause 8.2.2 with the following:

"Subject to the provisions of sub clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to the value of the progress of the Works as a whole.

Should the Employer's Agent grant an extension of time for the completion of the total works, the Contractor will be entitled to an increase in the sums tendered for time-related items, which increase shall be in the same proportion to the original tendered sums, as the extension of time is to the duration of construction as defined in PSA 8.1.2.1. The Contractor shall however note that the aforementioned will not apply to extensions of time granted in terms of PSA 8.4.6.

Payment of such increased sums will be taken to be as full compensation for all additional preliminary and general costs, either time-related costs or fixed costs that result from the circumstances pertaining to the extension of time granted."

The payment to the Contractor for Time-Related Items shall be adjusted in accordance with the following formula in the event of the Contract being extended by means of a Variation Order:

$$\text{Sum of Tendered amounts for Time Related Items} \times \frac{\text{Extension of Time authorised by Variation Order}}{\text{Tender Contract period}}$$

For the purposes of applying this formula "Extension of Time" will exclude the Contractor's December / January close-down period, if applicable.

The abovementioned adjustment of the payment for Time-Related Items shall be made in the completion Payment Certificate and shall be the only payment for additional Time-Related costs irrespective of the actual period required to complete the Contract including its authorised extensions.

In the case of fixed price contracts, the amount by which the Time-Related Items is adjusted shall not be subject to the Contract Price Adjustment formula.

In the case of contracts subject to Contract Price Adjustment the amount by which the time-related items are adjusted shall be subject to the Contract Price Adjustment formula."

PSA 8.3.1 & Contractual requirements

8.4.1

Add the following:

"The sum tendered shall cover all initial costs incurred in complying with the requirements of the Conditions of Contract and include for the cost of providing and maintaining the special risks insurance stipulated in the Conditions of Contract, if applicable."

PSA 8.3.2.1 Facilities for Employer's Agent

Replace the contents of this Clause with the following:

"(a) One Contract Nameboard Unit: Sum

The facilities provided shall comply with the applicable requirements of SABS 1200 AB and PSAB."

PSA 8.3.2.2 Facilities for Contractor

Notwithstanding the detail breakdown of items provided (items a to j), a single sum shall be tendered to cover all these items under the heading of "Facilities for Contractor".

PSA 8.4.1 Contractual requirements..... Unit: Sum

Add the following:

"The sum shall further cover all the time-related establishment costs and be the full compensation to the Contractor for:

- (i) The maintenance of his whole organisation as established for this Contract.
- (ii) The maintenance of all insurances, indemnities and guarantees required in terms of the Conditions of Contract, where applicable.
- (iii) Compliance with all general conditions and requirements which are not specifically measured elsewhere for payment in these Contract Documents.

Payment shall be made monthly in compliance with the method laid down in PSA 8.2.2.

The Contractor will not be paid Time-Related Preliminary and General Charges for any special Non-Working Days, as stipulated in the Conditions of Contract, which shall be deemed to have been allowed for in his rates.

The sum shall also include, where applicable, for the cost of providing and maintaining the special risks insurance stipulated in the Conditions of Contract."

PSA 8.4.2.1 Facilities for Employer's Agent

Replace the contents of this Clause with the following:

- (a) Two Contract Nameboard Unit: Sum
- (b) Survey labourers Unit: Labourer Month

The facilities provided shall comply with the applicable requirements of SABS 1200 AB and PSAB.

Payment for the provision of survey labourers will be made pro-rata the period the labourers are provided."

PSA 8.4.2.2 Facilities for Contractor

Notwithstanding the detail breakdown of items provided (items a to j), a single sum shall be tendered to cover all these items under the heading of "Facilities for Contractor".

PSA 8.4.2.3 Replace the words "periods stated" in the second line of this Clause with the following:

"duration of construction as defined in PSA 8.1.2.1".

"PSA 8.4.6* Compensation in terms of Subclause 5.12.2.4 and Clause 9.1.4 of the Conditions of Contract for delays incurred:

- (a) Plant..... Unit: Sum per working day
- (b) Labour..... Unit: Sum per working day
- (c) Supervision Unit: Sum per working day
- (d) Other services, facilities etc. not covered by
 (a), (b) and (c)..... Unit: Sum per working day

The sum tendered for each item shall cover the full and final standing cost per day of delaying the specified resource or facility and no additional compensation shall apply, notwithstanding any provisions to the contrary in the contract documents, or in respect of any extension of time granted in relation to the circumstances described in Subclauses 5.12.2.4, 9.1.1 and 9.1.2 of the Conditions of Contract.

For the purposes of calculating the total delay, a working week shall be held to consist of five working days and a working day 9 hours.

Payment for the partial standing of any of the scheduled resources for a day or part thereof, or the standing of a complete resource for a part day, will be made pro-rata in proportion to an appropriate factor assessed by the Employer's Agent.

The amount by which compensation for delays is adjusted shall be subject to the contract price adjustment formula as defined in the Conditions of Contract.

This payment item shall only apply to delays which in the opinion of the Employer's Agent are due to the circumstances described in Subclauses 5.12.2.4, 9.1.1 and 9.1.2 of the Conditions of Contract. No Payment will be made for any salary related or other internally caused strikes. The cost of delays incurred for all other circumstances shall be treated as provided for in the Conditions of Contract.

The provision of this Clause shall in no way prejudice the right of either the Employer or the Contractor to determine the Contract in terms of the provisions of Clause 9 of the Conditions of Contract.

The Contractor shall take note that no payment will be considered for any additional cost incurred in protecting his plant and site establishment, as well as for costs incurred in respect of damage to constructional plant and equipment."

PSA 8.5 SUMS STATED PROVISIONALLY BY THE EMPLOYER'S AGENT

Replace the contents of Clause 8.5 with the following:

"PSA 8.5.1 Works Executed by the Contractor.....Unit: Prov Sum

The Contractor will be reimbursed in substitution of the Provisional Sums (if any) allowed in the Bill of Quantities for work to be executed by the Contractor, in the amounts determined in accordance with the provisions of Clause 6.6 of the Conditions of Contract.

PSA 8.5.2 Works Executed and performed by the Selected Subcontractors in Consultation with the Employer

- (a) Work to be executed and performed by the Selected Subcontractor in Consultation with the Employer.....Unit: Prov Sum
- (b) Overheads, charges and profit on item (a) above.....Unit: % or Sum

Sub-items (a) and (b) will be provided in the Bill of Quantities for each different Selected Subcontract included in the Contract.

The Contractor shall be reimbursed under sub-item (a), in substitution of the respective Provisional Sums (if any) allowed in the Bill of Quantities, the amounts actually paid or payable by the Contractor to the respective Selected Subcontractors, in accordance with the provisions of Clauses 4.4.3 and 6.6 of the Conditions of Contract.

The Contractor shall be paid under sub-item (b), either:

- (a) where the unit of measurement for sub-item (b) was specified as being a percentage, the respective percentage, as stated by the Contractor in its Tender, of the amount certified by the Employer's Agent for payment under the related sub-item (a), all in accordance with the provisions of Clause 6.6.1.2.1 of the Conditions of Contract: or
- (b) where the unit of measurement for sub-item (b) was specified as being a Lump Sum, an amount which is in the same proportion to the amount certified for payment under sub-item (a) and the tendered Lump Sum is to the amount of the Provisional Sum stated under sub-item (a);

provided always that where the Contractor has failed for any reason, to insert a percentage or Sum (as applicable) for sub-item (b) in its tender, or where no provision was made in the Tender Documents for tenderers to make any such entry, the Contractor will, in accordance with the provisions of Sub-clause 6.6.1.2.2, be paid an amount equal to SEVEN AND ONE HALF PERCENT (7½%) of the amount actually certified by the Employer's Agent for payment under sub-item (a).

The percentage or sum (as applicable) paid under sub-item (b) as aforesaid, shall be deemed to include for full and final compensation to the Contractor for all costs as may be incurred and all charges and profits associated with the engagement, supervision, administration and management of the Nominated Subcontractor and in fulfilling its obligations under the contract as the principal Contractor."

Replace Clause 8.6 with the following:

"PSA 8.6 PRIME COST ITEMS

PSA 8.6.1 Prime Cost Sums

- (a) Description of Item to which Prime Cost Sum Applies..... Unit: PC Sum
- (b) Charge Required by Contractor on Sub-item (a) above..... Unit: %

Sub-items (a) and (b) will be provided in the Bill of Quantities for each different item to which a Prime Cost Sum applies.

The Contractor shall be reimbursed under sub-item(s) (a) in substitution of the respective Prime Cost Sums included in the Contract, the actual price(s) paid or payable by him in respect of the goods, materials or services supplied, but excluding any charges for the Contractor's labour, profit, carriage, establishment or other charges related to such goods, services or materials.

The Contractor shall be paid under sub-item (b), the respective percentage, as stated by the Contractor in its Tender, of the amount certified by the Employer's Agent for payment under the related sub-item (a). The percentages tendered by the Contractor for each respective sub-item (b) included in the Bill of Quantities shall be deemed to in full and final compensation to the Contractor in respect of any charge by the Contractor for labour, carriage profit, establishment and for any other charges related to the goods, services or materials supplied under the related sub-item (a).

If the Contractor shall have omitted within its Tender to insert a tendered percentage under sub-item (b), or tendered a zero percentage, the Contractor's tendered rate for sub-item (b) shall be deemed to be zero and the Contractor shall not be entitled to any payment under sub-item (b)."

Note:

1. Only payments for successful test will be made under the Prime Cost Sum provided in the Bill of Quantities for "additional acceptance control testing by the Employer's Agent".
2. The Contractor is responsible for the cost of process control testing. Payment in terms of the above will only be made for acceptance control testing ordered by the Employer's Agent.

“PSA 8.7 DAYWORK

Add the following:

“To ensure that the plant is achieving a reasonable output of work, the Employer’s Agent personnel will randomly monitor and measure work produced. Poor performance of any item of plant will be noted by the Employer’s Agent and certain reductions in payment may be applied.

Furthermore, should the performance of a machine be poor, or persistently break down, the Employer’s Agent may order that it be replaced, all at the cost of the Contractor.”

PSA 8.8 TEMPORARY WORKS

PSA 8.8.2 Accommodation of Traffic

A specific item has been included in the Bill of Quantities to allow the Contractor to cover the costs of accommodating traffic in the Damon Street and R331 at all times. At least 7 days advance notice must be given to residents/visitors that will be affected before excavations/work can commence near any particular road. Unless it is impossible to do so, roads must remain open for access to the community/visitors at all times unless written permission is granted by the Employer’s Agent.

The sum shall cover the effect on the Contractor’s programme, delay in the works, damage to or loss of a deviation, supply, erection and moving and re-erection of all necessary traffic signs, drums, barricades, the provision of flagmen and any other operation or equipment, plant or labour necessary.

Payment under this item will be made on a pro-rata basis to the duration of the contract.

PSA 8.8.4 Existing services

Replace the heading of paragraph (c) with the following:

“(c) Excavate by hand in soft material to expose existing services Unit: m³

Add the following:

“The rate tendered for (c) shall further cover the cost of backfilling the excavation with excavated material compacted to 90% of modified AASHTO maximum density, loading, transporting and disposing of surplus material as directed, keeping the excavation safe, dealing with water, protecting the exposed services, and any other operation necessary to complete the work.

No distinction will be made between the various types of services to be exposed, or the depths to which excavations are taken.

Excavation in excess of that authorised will not be measured for payment.”

”PSA 8.8.6 Dealing with water Unit: Sum

The sum shall cover the cost for the provision, operation, maintaining and removal of all plant and materials required to deal with any water anywhere on site as required in terms of Sub clause 5.1.3 of SABS 1200 D and Sub clause 5.1.2 of SABS 1200 DB. No additional payment will be made for “Special water hazards”.

The sum shall cover the cost of providing the necessary plant or materials, or both, fully erected and operative on the Site, the cost of operating and maintaining pumps, well points, sheeting, close timbering, and other equipment, as applicable, for 24 Hours a day, 7 days a week, throughout the period during which the facilities are required, and the cost of removing such goods and restoring the Site to its original condition on completion of that part of the project for which the temporary works were erected. Two equal payments will be made, one with the first and the other with the last payment certificate.

"PSA 8.8.7* Compliance with the occupational health and safety act (Act 85 of 1993) and all relevant and applicable regulations, especially the construction regulations, 2014 as promulgated on 7 February 2014 under section 43 of the occupational health and safety act (Act 85 of 1993), as amended from time to time, for the duration of the contract

- (a) Contractor Unit: Sum
- (b) Subcontractors (own) Unit: Sum

The tendered sums shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and the Construction Regulations 2014 at all times, as described in the Scope of Work and Employer's health and safety specification (Refer Particular Specification PB). The successful tenderer shall provide the Employer's Agent with a complete breakdown of this tendered sum, if so required.

The Contractor shall note that all obligations contained in the Act, Regulations and Employers health and safety specification shall be included in this item. No additional claims will be considered; neither will an extension of time be considered for delays due to non-compliance with the Contractor's health and safety plan.

The sums will be paid to the Contractor in equal monthly amounts."

"PSA 8.9* Installation of Benchmarks by Registered Surveyor..... Unit: No

The number tendered shall include full compensation for the installation of benchmarks to mSL, by a registered surveyor as required by the Employer's Agent, during construction and shall include the protection during construction and marking the benchmark on completion of the Works.

NOTE: The cost to set out the Works in terms of 5.1.1 and PSA 5.1.1 shall be deemed to be covered by the sums tendered for other obligations under Subclauses 8.3.3 and 8.4.5."

"PSA 8.10* Sanctions Unit: Prov Sum

The provisional sum shall cover any sanction or bonus due as specified in subclause C3.3.3. The provisional sum shall be expended in accordance with Clause 6.6 of the Conditions of Contract."

PSA 8.11* Appointment of CLO

The sum shall include all costs to remunerate the CLO for the duration of the contract.

PSA 8.12* Survey Beacons/Pegs

The rate shall include all costs to locate, record, reference and protect survey points, benchmark, erf boundary pegs and other reference pegs and expose on completion of the works.

PSA 8.13* EME Construction Managers Unit: Man Month

The contractor shall employ an EME construction manager who will manage the EME's and report on progress at the contract site meetings. Such Construction Manager must be adequately experienced with EME work and the development thereof and will be subject to the approval of the Employer.

The EME construction manager shall be a dedicated resource whose only responsibility is to manage the EME subcontractors and as such shall not be the site agent or any other person employed on the contract for other purposes.

The assistance rendered by the Construction Manager, shall inter alia:

- a) Be given at a level and to the extent which is commensurate with the expertise and resources of the EME,
- b) Be given in a manner which is neither prescriptive, dictatorial, nor coercive towards the EME;
- c) Not be utilized by the Contractor to manipulate the rates and prices submitted, to his advantage, and
- d) Be given in a manner which does not unfairly prejudice or favour any particular EME.

The EME Construction Manager will work with and manage the EME Subcontractors throughout their involvement on the contract, but may only be on site during times when EME subcontractors are performing work. During the time that EME subcontractors are performing work, the EME Construction Manager shall be available on site during normal working hours.

PSA 8.14* EME Subcontract Works (Description) Unit: Provisional Sum

Provisional sums have been allowed for reserved work packages for work awarded to subcontractors selected in consultation with the Employer in accordance with Clause C3.3.2. The sum paid shall be as certified by the Engineer for work completed by the EME Sub-Contractor(s).

PSA 8.15* Transport and Accommodation of Workers for Training

A provisional sum is allowed for transport & accommodation of workers for training, where it is not possible to undertake the training in close proximity to the site.

Add the following payment Items:

- (a) Transport and Accommodation of workers for training Prov. Sum
- (b) Handling costs and charges for Contractor Percentage (%)

PSA 8.16* Compliance to EPWP Reporting

A provisional sum is allowed for the compliance to EPWP reporting by contractor.

Add the following payment Items:

- (a) Compliance to EPWP reporting Prov. Sum

PSA 8.17* Testing and Commissioning

The general requirements for the commissioning of equipment as well as the standards laid down for acceptance tests of material and equipment applies.

Commissioning procedures as stipulated by the suppliers of equipment shall at all times be strictly adhered to. The commissioning of specialised equipment shall be undertaken by the supplier or an approved specialist.

All safety protection systems shall be fully commissioned and set points properly checked out and adjusted, before equipment shall be allowed to run for commissioning purposes.

The responsible Commissioning Technician shall be present to supervise the operation and adjustment of the equipment during the entire commissioning stage. All instrumentation required to measure flows, electrical power absorbed, temperatures, pressures, velocities or sound, shall be provided by the Contractor. All commissioning data shall be fully tabulated in conjunction with the design data, and submitted to the Engineer prior to any performance inspections or acceptance tests being carried out by the Engineer.

Where the Engineer is to witness tests, the Contractor shall ensure that the Engineer receives one week's prior notice in writing, before such tests commence. Tests to demonstrate the capacity specified and general operating characteristics of all apparatus etc., shall be made under the direction of the Engineer at the time of final inspection under conditions imposed by him.

After completion, either in part or as a whole, the complete installation shall be subject to acceptance tests by the Engineer.

The Contractor must assist the Engineer during any test carried out and must supply all tools and instruments for testing purposes.

PSA 8.18* Training Allowance Paid to Targeted Labour In Terms of Formal Training

A Provisional amount is allowed for the training allowance to be paid to targeted labour while undergoing formal training.

Add the following payment Items:

- (a) Training allowance to Targeted Labour in Terms of Formal Training (Provisional) Prov. Sum
- (b) Handling costs and charges for Contractor Percentage (%)

PSA 8.19* Provisional Sum for Work to be undertaken by Eskom

Add the following payment Items:

- (a) Work undertaken by Eskom (provisional) Prov. Sum
- (b) Handling costs and charges for Contractor Percentage (%)

PSAB EMPLOYER'S AGENT'S OFFICE

PSAB 3 MATERIALS

PSAB 3.1 Nameboards

Delete: "The standard board of the South African Institution of Civil Engineer" and replace by "the standard nameboard of the Employer's Agent's Department, in accordance with Drawing PSA 2 of Standard Details July 2007".

Add: "In addition, the Contractor shall provide and erect two Identity Boards in accordance with Drawing PSA 3 of Standard Details July 2007". They shall be placed and moved, as directed by the Employer's Agent Representative.

PSAB 3.2 Office Building(s) Add the following:

One office complete with desk, chair and double door cabinet is required under lock and key. The Employer's Agent and contractor would share this office.

PSAB 3.3 Car Port

"2 No Carports required."

PSAB 4 PLANT

PSAB 4.1 Telephone

A telephone will not be required for the Employer's Agent.

PSAB 5 CONSTRUCTION

PSAB 5.5 Survey Assistants

The Contractor shall provide a survey assistant for full time use by the Employer's Agent for the duration of the Contract. The survey assistant shall have at least a Grade 12 level of education and be employed from the local community. The survey assistants will assist the Employer's Agents Representative with survey work, measurement, recording of construction record information and other work as directed by the Employer's Agent.

The remuneration of the survey assistant with minimum Grade 12 education is to be determined by the Contractor.

PSAB 8 MEASUREMENT AND PAYMENT

PSAB 8.1 Name Boards

The rate is to include for the manufacture and erection of 2 nameboards as per the municipal standard drawings PSA 2 and PSA 3, and as detailed in PSAB 3.1.

PSAB 8.2.3 Survey Assistant (New Clause)

Payment for the survey assistant shall be at the tendered daywork rates for the hours worked in assisting the Employer's Agent Representative.

__PSC SITE CLEARANCE

PSC 3 MATERIALS

PSC 3.1 DISPOSAL OF MATERIAL

Add the following:

"Material obtained from clearing and grubbing, including builder's rubble, and other unwanted debris, shall be disposed of at spoil sites obtained by the Contractor.

All transport costs shall be included in the rates tendered for site clearance."

PSC 5 CONSTRUCTION

PSC 5.1 AREAS TO BE CLEARED AND GRUBBED

Add the following:

"Notwithstanding the above, the Employer's Agent may, where particular areas are scarcely vegetated, order that the clearing and grubbing operation be totally or partially omitted, in which case no payment will be made under this section.

Payment will then only be made for excavation included under the relevant earthworks section."

PSC 5.5 RECLEARING OF VEGETATION

Add the following:

"Except if otherwise agreed, where areas have to be re-cleared on the written instruction of the Employer's Agent, such re-clearing shall be carried out at the Contractor's own cost and the Contractor is advised therefore, not to clear areas at such an early stage that re-clearing may become necessary."

PSC 5.6 CONSERVATION OF TOPSOIL

Add the following:

"Conservation of topsoil, together with grass, roots and chipped mulch shall be applicable. Stockpiling of topsoil will be allowed on Site in specific locations indicated by the Employer's Agent. Topsoil shall not be stockpiled higher than 2,0m. Care shall be exercised to prevent the compaction of topsoil in any way especially by vehicles travelling over such material."

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.1 BASIC PRINCIPLES

Add the following:

"The thickness of the layer that will unavoidably be stripped during clearing of vegetation will be taken as 100 mm. This implies that levels used in earthworks quantity calculations will be 100 mm lower than the original levels excluding stripping of topsoil to stockpile where applicable."

Add the following:

"Levels to be used for earthworks quantity calculations will be surveyed once the clearing operation has been completed."

PSC 8.2 SCHEDULED ITEMS

PSC 8.2.1 Clear and grub

Replace the first line with the following:

"The area designated by the Employer's Agent to be cleared and grubbed will be measured in square metre to the nearest metre or"

Delete "(except where 8.2.9 is applicable)" in the seventh line of this clause,

Add the following:

"The tendered rate shall also cover the cost of loading, transporting and disposing of vegetation, builder's rubble, and other unwanted debris encountered in road reserves or along service routes at the designated spoil site described in the Scope of Works."

"PSC 8.2.5 Take down and re-erect existing fences..... Unit: m

Add the following to subclause 8.2.5

"The rate shall further cover the cost to reinstate the fences to their original status, as well as for all new material in so doing"

"PSC 8.2.10 Remove topsoil to nominal depth of 150 mm, stockpile and maintain Unit: m³

Replace the heading and contents of subclause 8.2.10 with the following:

The rate shall cover the cost of removing the topsoil where ordered, together with such vegetation and small roots as may occur within the specified depth, for loading, transporting to designated area on site, for stockpiling, for maintaining and wetting (dust control) the stockpile for the full duration of the Contract.

Add the following clauses:

"PSC 8.2.11* Final finishing and cleaning up of site..... Unit: Sum

The tendered sum shall include full compensation for the clearing, disposal of material, finishing, tidying and all other work required to finish and clean up the Site of the works and affected areas by removing excess earth, stones, boulders, debris and other waste material, by clearing stormwater inlets and outlets and pipe barrels, by clearing the surfacing of all dirt, mud and foreign material, and by neatly finishing off all junctions, intersections and kerbing.

All material resulting from the finishing operations shall be disposed of to a spoil site furnished by the Contractor.

The tendered rate shall make provision for the reinstatement of existing driveways to their original condition where these have been affected by the works, as these items will not be measured and paid for separately.

PSD EARTHWORKS

PSD 3 MATERIALS

PSD 3.1 Classification for Excavation Purposes

Delete SABS 1200:D Clause 3.1 and replace with the following:

PSD 3.1.1 Method of Classifying

The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Employer's Agent or his Representative will decide on the classification of materials. In the first instance classification will be based on inspection of the material to be excavated and on the criteria given in PSD 3.1.2(a) and (b).

PSD 3.1.2 Classes of Excavation

All materials encountered in any excavation for any purpose including restricted excavation will be classified as follows:

(a) Hard rock excavation

Hard rock excavation shall be excavation in material (including undecomposed boulders exceeding 0.17 cubic metres in individual volume) that cannot be efficiently removed without blasting, wedging and splitting, or hydraulic hammers.

This classification includes materials such as:

- solid unfractured rock occurring in bulk
- solid ledges thicker than 200mm
- igneous rock intrusions
- cemented sedimentary rocks.

(b) Soft Excavation

Any material which can be removed by bulldozers or backhoes, shall be classified as soft excavation. Soft excavation shall be material not falling into the category of hard rock excavation.

PSD 5 CONSTRUCTION

PSD 5.1 EXPLOSIVES (SUB-CLAUSES 5.1.1.3)

Notwithstanding Sub-Clause 5.1.1.3, the Employer's Agent shall be notified at least Forty-eight (48) hours beforehand of the Contractor's intention to use explosives on site.

It shall be incumbent on the Contractor to make himself aware of restrictions to blasting imposed by the KOUGA LOCAL and other similar authorities. Where the presence and location of the pipeline or Eskom power lines etc. are known or are shown on the Employer's Agent's drawings at tender stage the Contractor must make allowance in his rates and programmes for restrictions and delays which may result from restrictions imposed by the authorities.

The Contractor to provide the Employer's Agent with a detailed method statement for approval, of the anticipated blasting method for each blasting occasion. Trackrigs are not permitted.

PSD 5.1.2.5 Negligence (Sub-clause 5.1.2.5)

The Contractor shall be liable for all damages to services caused as a result of the Contractor's negligence.

PSD 5.2 Excavation and Placing (Sub-clauses 5.2.2 and 5.2.3)

After clearing and before placing any fill material the Employer's Agent approval of the suitability of the in-situ material shall be

obtained. The Employer's Agent shall direct, if the nature of the excavated material so requires (as is the case with clayey material), that certain portions of the excavated material be placed only in specific sections of the embankments. The Contractor will receive no additional payment for such selection.

Where excavated material, which is designated as suitable fill material becomes contaminated or is mishandled or misplaced by the Contractor, he shall remove the contaminated material and/or replace the shortfall with suitable material at his own expense.

PSD 5.2.1.2 Conservation of Topsoil

Add the following to Clause 5.2.1.2:

"Topsoil shall not be stockpiled higher than 2.0m. Care shall be exercised to prevent the compaction of topsoil in any way especially by vehicles travelling over such material."

PSD 5.3 Borrow Pits (Sub-clauses 5.2.2.2 and 5.2.3)

Unless off-site borrow pits are shown on the Employer's Agent drawings or are designated by the Employer's Agent at tender stage, the Contractor shall make his own arrangements for the importation of material of a specified quality, when and if required, from borrow pits outside the Contract Site.

PSD 5.2.3.1 Placing and Compacting – Embankments (Sub-clause 5.2.3.1)

Notwithstanding subclause 5.2.3.1, for cohesive soils the upper 600mm of all fills shall be compacted to a minimum of 93% MAASHTO density.

PSD 5.2.3.1 Rock Fills (Sub-clause 5.2.3.1)

Rock excavated from cut shall be used in the portion of the fill that is more than 1m below finished level. The rock material shall be deposited in layers of thickness at least sufficient to accommodate most of the rock material, provided that the thickness of the uncompacted layer does not exceed 750mm. The rock fill shall be spread and sorted by a bulldozer of adequate size to obtain layers of uniform thickness. Oversize material (i.e. any rock having a maximum dimension exceeding 600mm) shall be either broken down to size or, where by the nature of the material this is impracticable, dozed to the outside of the embankment and removed as spoil.

After the material has been spread, the interstices shall be filled with small rock or fine grained material and if, after the addition of such material, the stone layer is still too rough to roll, sufficient fine-grained material shall be added to blind the surface, or the unevennesses shall be broken down by knapping. The layer shall then be watered and given six passes of a 6t vibrating roller or four passes of a 10t vibrating roller. If the 'lock' or the void in the finished layer is not to the satisfaction of the Employer's Agent, he may order spot dumping and hand distribution of suitable fine material, and the application of further water between passes and such additional rolling as he may consider necessary for a dense stable embankment fill to be obtained.

The upper portion of the fill within 1m of finished level shall be constructed in layers of thickness not exceeding 300mm before compaction. The layers shall be formed with material containing no lumps, stones, or clods that, after being broken down and compacted, have any dimension greater than 150mm.

PSD 5.4 Compaction (Sub-clause 5.2.4)

The upper 600 mm of all fills shall be compacted to a minimum of 93% MAASHTO density.

Where material is carried to spoil, or to fill low areas, filling shall be done, unless otherwise specified, in accordance with sub-clause 5.2.3.1 except that compaction requirement will be relaxed. In such cases each layer of material deposited shall be compacted by spreading with earthmoving equipment and by routing construction traffic such that the whole of each layer is traversed by heavy equipment.

PSD 5.5 Disposal of Material

All surplus material and all unsuitable material from excavations and clearing and grubbing operations shall be removed from the Site by the Contractor and shall, notwithstanding Sub-clause 5.1.6, be disposed of at the site described in C3.4.6.

PSD 5.6 Topsoiling

Topsoil shall be placed as directed in sub-clause 5.2.5.2 on the faces of embankments and other flatter areas, disturbed by construction activities, to a nominal thickness of 100 mm after light compaction.

PSD 5.7 Over Excavation for Workspace

Subclauses 5.2.2.1 (b) and (c) and Subclause 5.2.3.2)

Other than for sides of mass concrete, slabs and footings, no concrete shall be placed against the sides of excavations.

For external concrete faces below ground level, the Contractor shall over excavate to provide sufficient working space which shall be backfilled with selected excavated material complying with the requirements of Subclause 3.2.2. The backfill shall be brought up in layers not exceeding 300 mm (before compaction) and compacted at optimum moisture content to a density of at least 95 % of MAMDD.

PSD 5.8 Filling in Over Break Under Structures

All overbreak in hard material under structures shall be cleared of loose material and the resulting voids filled with blinding concrete unless otherwise directed by the Employer's Agent.

PSD 7 TESTING

PSD 7.1 Tests to Contractors Account

The Contractor shall make arrangements with a soils testing laboratory to undertake the following tests and to pass the test results to the Employer's Agent. The costs of such tests shall be included in the rates tendered for the appropriate item in the Schedule of Quantities.

a) Material Imported from Outside the Contract Site as a Working Surface, or for Fill Material:

One CBR and indicator test per 500 m³ of compacted material brought on site. (Beach or river sand will normally be exempted from this requirement). A sample and one CBR and indicator test of the material proposed for importation shall be submitted to the Employer's Agent for approval prior to the commencement of importation.

b) Fill Material in Place:

One density and moisture content per 200 m³ of compacted fill.

c) Compacted Sub-Grade or Finished Level:

One density and moisture content per 500 m² of compacted surface area.

Should any of the above density tests fail to comply with the specified requirements, the Contractor shall at his own expense, remedy the failure and submit a new test to the Employer's Agent.

PSD 7.2 Tests to the Employers Account

Where CBR, indicator tests and the like are required on material from within the Contract Site, the Contractor shall also make arrangements with an approved soils testing laboratory to undertake these tests, the costs of which will be per sample tested and reported to the Employer's Agent.

PSD 7.3 Material or Compaction Standard not to Specification (Sub-Clause 7.3)

The Employer's Agent shall have free access to the site and will undertake numerous inspections of the work in progress to ascertain compliance with the specifications. The Contractor shall be prepared at any time to demonstrate such compliance and will be required to establish conformity line, level, cross-section and tolerance by the use of straight-edge, tape, level, etc.

The Employer's Agent may also require additional tests to those specified in Clause PSD 7 above. Where such additional tests

prove compliance with the specification, the Employer will meet the costs. Where such tests fail the Contractor shall meet the costs to remedy the tests that failed.

PSD 8 MEASUREMENT AND PAYMENT

PSD 8.1 Extra-over Payment for Excavation Classification

No extra payment will be made for excavation that is classified as "intermediate excavation" in accordance with PSD3.1. The cost of excavation of intermediate material shall be covered by the tendered rate for excavation in all materials.

PSD 8.2 Topsoiling

The rate for topsoiling shall cover the cost for the excavation of the topsoil, hauling, stock piling and maintaining during the construction period. Once the topsoil is required to be placed, loading, hauling, spreading to a thickness of 100 mm and compacting is required. The width (max) of top to be stripped is 5m.

PSD 8.3 Form Embankment

Measurement will be by volume of the formed embankment.

The rate shall cover all costs in taking the material from the stockpiles and placing and forming the embankment fill blanket over the sewer pipeline and against manholes and chambers. It shall also include the cost of selecting the material to be carefully placed on top of the pipeline and directly against the concrete structures, without causing damage to the concrete surfaces.

PSD 8.4 Excavation for Working Space

Excavation for working space will be measured as the vertical area of the concrete below ground level formed with formwork.

The tendered rate shall include for the cost of backfilling as specified.

PSD 8.5 Unavoidable Over Breaking in Hard Rock

No separate payment will be made for the removal and disposal of unavoidable overbreak material from excavations in hard rock. All extra costs associated with the occurrence of overbreak, including the subsequent filling in of the resulting voids, will be held to be included in the various tendered rates.

PSD 8.6 Freehaul and Overhaul

Notwithstanding any clauses in this Scope of Work, or any clauses in the Standardised Specification dealing with the definition, measurement and/or payment for transport, freehaul and/or overhaul, no measurement or payment for overhaul will be made. All haulage will be considered to be freehaul and the cost thereof will be deemed to be covered by other rates in the Bill of Quantities.

PSD 8.7 Cut

Measurement will be by volume.

The rate for cut shall cover the cost for the excavation of the material, hauling, stock piling and maintaining during the construction period. Once the excavated material has been used in the fill operation all remaining material to be spoiled at a suitable spoil site, located by Contractor, off-site and dispose of surplus material.

PSD 8.8 Fill

Measurement will be by volume.

The rate for fill shall cover the cost for taking delivery of material that has been stockpiled, loading, hauling, spreading and compacting in layers of 150 mm to 93% Mod AASHTO. It shall also include the cost of selecting the material to be carefully placed on top of the pipeline and directly against the concrete structures, without causing damage to the concrete pipe and surfaces.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB 3 MATERIALS

PSDB 3.1 CLASSES OF EXCAVATION

Delete the contents of Clause 3.1 and replace with the following:

"The classification shall be as described in PSD 3.1".

PSDB 3.5 BACKFILL MATERIAL

Replace the contents of Subclause (b) and add Subclauses (c) and (d) as follows :

"In areas subject to road traffic loads which shall be held to extend 2,5m either side of the road centre line, as well as beneath concrete lined channels, backfill shall comply with the requirements of PSME 3.2.2

Add the following paragraphs to subclause 3.5:

"(c) Cement-stabilised backfilling

Backfilling shall, where directed by the Employer's Agent, be stabilised 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.

(d) 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 3.7 SELECTION

Replace the words "if he so wishes" in the first line of the second paragraph with the words "at his own cost".

Add the following to subclause 3.7:

"Notwithstanding anything to the contrary stated in this subclause the Contractor shall, where so ordered, selectively stockpile topsoil, material complying with 3.5, as well as road materials for re-use in terms of 5.9."

PSDB 5 CONSTRUCTION

PSDB 5.2 MINIMUM BASE WIDTHS

Notwithstanding the provisions of this Subclause, the minimum base widths for the various trenches shall be as shown on the Drawings.

PSDB 5.4 EXCAVATION

Add the following:

"Except where otherwise specified, trenches shall be of such a depth that the minimum cover over the pipes shall be 700mm, except at road-crossings, where the minimum cover shall be 1 000 mm. No trench may be left open over the period 16 December to 8 January inclusive.

Where trenches have to be excavated under this Contract adjacent to live services / other services laid under other contracts, it may be necessary to shore trenches to prevent damage to the live services / other services. It will be the responsibility of the Contractor to ensure that services constructed under other contracts of live services are not damaged by his operations during the Contract.”

PSDB 5.6 BACKFILL

PSDB 5.6.1 General

Replace the first sentence with the following:

“Backfilling of pipe trenches may only commence after the pipe has been laid, firmly bedded in the specified cradle, the blanket placed and compacted as specified and after the pipe has been tested in terms of Clause 7 of SABS 1200 L.”

PSDB 5.6.2 Material for backfilling

Replace the last paragraph of this Clause “In areas.....backfill” with the following:

“The material for backfilling in areas subject to road traffic loads shall comply with PSDB 3.5.”

PSDB 5.6.3 Disposal of soft excavation material

Replace the words “unless otherwise required in the project specification.” at the end of this Subclause with:

“or to spoil in accordance with the requirements of PSD 5.2.2.3 and Subclause 5.2.2.3 of SABS 1200 D, as instructed by the Employer’s Agent.”

PSDB 5.6.6 Completion of backfilling

Add the following:

“If in the opinion of the Employer’s Agent insufficient progress is being made with the backfilling of trenches, the Employer’s Agent will be entitled to order that no further excavation takes place until the backfilling operation has caught up.”

PSDB 5.7 COMPACTION

PSDB 5.7.1 Areas not subject to Traffic Loads

Add the following sentence:

“All non-cohesive material shall be compacted to 100% of modified AASHTO maximum density.”

Replace the heading and contents of subclause 5.7.2 with the following:

PSDB 5.7.2 Areas Subject to Traffic Loads and beneath concrete lined walkways, cyclepaths and stormwater channels:

In areas subject to traffic loads and beneath concrete lined walkways, cyclepaths and stormwater channels, trenches shall be backfilled from the top of the bedding to the extent scheduled below in layers of thickness not exceeding 150mm after compaction, and the material shall be compacted to 95% of modified AASHTO maximum density.

TRENCH DESCRIPTION	EXTENT OF BACKFILL
Trenches beneath roadways to be constructed under the contract	Up to designated level of underside of layerworks
Trenches beneath concrete lined walkways, cyclepaths and stormwater channels	Up to designated level of underside of concrete lining

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.1.1 *Replace* “along the route of the pipeline” in the third line of SANS 1200 DB Clause 8.1.1 with “as specified in PSDB 5.6.3”.

Replace the contents of subclause 8.2.4 with the following:

"No separate items will be measured for shoring. Refer to Item PSD 5.1.1.2 in this regard."

"PSDB 8.2.5* If payment in terms of PSA 8.8.4 has been made to expose an existing service and the excavation involved falls within a proposed trench, the quantity measured for trench excavation shall be reduced accordingly."

PSDB 8.3 SCHEDULED ITEMS

PSDB 8.3.2 Excavation

(a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material Unit: m or m³

Replace the first sentence with the following:

"Items will be provided for various trench widths as specified and detailed on the Drawings and various depths in increments as specified in the Bill of Quantities."

Add the following sentence:

"The Contractor will be responsible for disposing of all surplus material and no additional payment will be made for overhaul, disposal fees or any other related costs."

Add the following to Clause (a):

"The rate tendered shall also cover the cost of complying with PSDB 3.5, as well as the cost of any disruption or delay in complying with PSDB 5.4 and PSL 5.1.4.

Delete Clause 8.3.2 (b)(1) as well as any reference to intermediate excavation in Clause (b). For the purpose of measurement and payment, excavation other than hard rock excavation will not be separately classified (refer PSDB 3.1).

Add the following new sub-items in 8.3.2 (b):

"(3) Hand excavation where ordered Unit: m³

The rate tendered shall cover the additional cost, extra over that provided for under 8.3.2(a), for carrying out, where ordered by the Employer's Agent and up to a depth of 1,0-meter, trench excavation by hand as well as for any inconveniences related to the continuation with machines across and over hand-excavated trenches.

The volume shall be computed from the dimensions specified, shown on the Drawings or ordered by the Employer's Agent.

Normal handwork required to clean and trim the sides and bottoms or mechanically excavated trenches will not qualify for payment in terms of this clause.

(4) Hand backfilling machine excavated trenches where ordered.....Unit: m³

The rate tendered shall cover the additional cost, extra over that provided for under 8.3.2(a) to, except for compaction which shall be carried out by machine, hand backfill machine excavated trenches where ordered by the Employer's Agent.

The volume shall be computed from the dimensions specified, shown on the Drawings or ordered by the Employer's Agent.

(5) Selective stockpiling of topsoil where ordered Unit: m³

The rate tendered shall cover the additional cost, extra over that provided for under 8.3.2 (a), to selectively stockpile topsoil where ordered by the Employer's Agent, including of off-loading, forming and maintaining the stockpile for as long as is required, reloading and transporting within the applicable freehaul distance from the stockpile.

The volume shall be computed from the dimensions ordered by the Employer's Agent."

(6) Disposing of spoil material on a site provided by the Contractor Unit: m³

The unit of measurement shall be the cubic metre, measured in accordance with Subclause 8.2 of SABS 1200D, of surplus and/or unsuitable material disposed of, on the instruction of the Employer's Agent, at a spoil site or spoil sites provided by the Contractor.

The tendered rate shall include full compensation for the additional cost of providing a spoil site or other means of disposing of surplus spoil material, for transporting the material regardless of the distance involved, for acceptance charges for such material and for all other incidental costs to dispose of the spoil material.

(7) Backfill stabilised with 5% cement where directed by the Employer's Agent 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 stabilised on the Employer Agent 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 stabilised material to 90% of modified AASHTO density."

(8) Soilcrete backfill where directed by the Employer's Agent Unit : m³

The unit of measurement shall be the cubic metre of soilcrete placed on the Employer's Agent 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."

PSDB 8.3.3 Excavation ancillaries:

PSDB 8.3.3.1 Deficiency in backfill material

Add the following to subclause 8.3.3.1(c):

The rate shall also include for compaction of sub base quality backfill as per PSDB 3.5

Replace the heading and contents of this Clause with the following:

PSDB 8.3.3.3 Compaction in road crossings Unit : m³

"This item shall only apply to the compaction of materials in areas subject to road traffic loads as defined in PSDB 3.5.

The volume will be computed from the length of trench falling within the defined area, the width as shown on the Drawings and the depth from the top of the bedding to the designated level of the underside of the required selected layer, finished verge level etc. as scheduled on the Drawings. The rate tendered shall cover the cost of the additional compactive effort as specified.

Payment for this work will be additional to that covered by 8.3.2(a)."

PSDB 8.3.6 Finishing

PSDB 8.3.6.1 Reinstatement road surfaces

Replace from "a) Gravel on shoulders...." Through to "...Etcetera's.....Unit: m²" with the following:

- "(a) Backfilling using TrenchfillUnit : m³
- (b) Hot asphalt type IVA (min thickness 40mm)Unit : m²
- (c) Gravel ShouldersUnit : m²
- (d) Concrete Driveways and Walkways (min thickness 100mm)Unit : m²
- (e) Grass verges and LawnsUnit : m²

For item (a) the volume will be computed from the length of trench as applicable and the width determined from the applicable side allowances specified in 8.2.3, and the depth from road surface to top of selected fill blanket. Payment for this item will be additional to that for excavation covered by 8.3.2.

For items (b) to (e) the area will be computed from the length of paved trench surface as applicable and the width determined from the applicable side allowances specified in 8.2.3.

The rates shall further cover the cost of temporary accommodation of traffic (including the signs and bypasses), arranging for safety of the public, excavation (including breaking up, removal and disposal of surplus material) and the subsequent reinstatement as specified in 5.9, and shall include the cost of delays and the cost of any risk of having to repair damage as specified in 5.10."

PSDM EARTHWORKS (ROADS, SUBGRADE)

PSDM 2 INTERPRETATIONS

PSDM 2.3 DEFINITIONS AND ABBREVIATIONS

Notwithstanding the definition of roadbed given under Clause 2.2 of SABS 1200 M, all in-situ surfaces requiring compaction as indicated on the drawings, shall be classified as roadbed.

PSDM 3 MATERIALS

PSDM 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

Notwithstanding the provisions of this Clause, the excavation of material will, for purposes of measurement and payment, be classified as specified in PSD 3.1.2.

PSDM 3.2.2 Fill

Notwithstanding the requirements of this Clause, material from commercial sources or borrow pits located by the Contractor, to be used in the fill, shall comply with the requirements of Clause 3.2.3 and PSDM 3.2.3.

PSDM 3.2.3 Selected layer

Replace the contents of this Clause with the following:

"The following requirements shall apply in respect of the selected layer:

- a) Maximum particle size: 60% of compacted layer thickness
- b) Unstabilised selected layer

(i) Upper selected layer

Minimum CBR at 93% of modified AASHTO density: 15

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

Note:

The requirements for the upper selected layer also apply where only one selected layer is specified.

(ii) Lower selected layer

Minimum CBR at 93% of modified AASHTO density: 7

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

PSDM 3.3 SELECTION

Notwithstanding the provisions of this Clause, the Contractor shall note that the excavation from the cutting shall be utilized for the construction of the lower layers of fills.

PSDM 5 CONSTRUCTION

PSDM 5.1.2 Accommodation of traffic

The requirements of Clauses PSA 5.10 and PSD 5.1.6 shall apply regarding the control and temporary accommodation of traffic.

PSDM 5.2.2.2 Dimensions of cuts

Delete "suitable material7" in the fifth line and replace with "material complying with 3.2.3 and PSDM 3.2.3."

Add after "drawings" in the second line of this subclause "which shall include for channels and sidewalks within the road reserve".

PSDM 5.2.2.3 Use of material

Add after "borrow pits" in the second line of subclause (d): "or commercial sources."

Add the following after subclause (d):

"(e) Commercial sources

The provisions of subclause PSD 5.2.2.5 of SABS 1200 D as amended shall apply."

PSDM 5.2.2.5 Disposal of surplus or unsuitable material

Add after "directed" in the second line of this Clause "(refer PSD 5.2.2.3)".

PSDM 5.2.3 Treatment of roadbed

PSDM 5.2.3.2 Removal of unsuitable ground

Replace the second sentence of paragraph (a) with the following:

"The excavated spaces shall then be backfilled with approved imported material compacted to the required density."

Add the following sentence to paragraph (b):

"Unsuitable excavated material will be paid for as cut to spoil."

PSDM 5.2.3.3 Treatment of roadbed

Add the following to Clause (a):

"The depth of compaction shall be 150mm."

Add the following paragraphs:

"(c) Three-pass roller compaction

Any portion of the roadbed that is shown on the Drawings or is specified or is directed by the Engineer to be given three-pass roller compaction because of its inadequate natural density, shall be prepared by shaping where necessary and compacting with a roller, complying with the requirements specified below.

Compaction shall comprise three complete coverages by the wheels of the specified roller over every portion of the area that is being compacted. While it is not the intention that the Contractor should apply water to the roadbed for this type of compaction, and while no rigid moisture control will be exercised during compaction, the Contractor shall nevertheless satisfy the Engineer that everything is being done to take full advantage of favourable soil moisture conditions during the rainy season, and that such compaction is as far as possible carried out when the roadbed is neither excessively dry nor excessively wet.

The Engineer has the authority to decide when conditions are favourable for compaction and where such compaction is to be carried out at any particular time, and he has the right to instruct the Contractor to water the roadbed at the Contractor's expense when, in the opinion of the Engineer, the Contractor failed, neglected or refused to comply with these requirements.

The rollers to be used for roller-pass compaction shall conform to the following requirements:

Grid roller: The grid roller shall have a mass of not less than 13,5 t when ballasted, shall be loaded to this mass if required, and shall be moved at a speed of not less than 12 km/h.

Vibratory roller: The vibratory roller shall be capable of exerting a combined static and dynamic force of not less than 120 kN/m width for every metre of loose-layer thickness at an operating frequency not exceeding 25 Hz and shall move at a speed not exceeding 4 km/h."

PSDM 5.2.4 Fill

PSDM 5.2.4.3 Finishing

Notwithstanding the provisions of this Clause the requirements of PSDM 5.2.9 shall as applicable apply to the finishing off of verges.

PSDM 5.2.5 Selected layer

Replace the contents of this Clause with the following:

"Except with regard to density, the requirements of Clause 5.2.4 shall apply. The degree of compaction shall be:

Upper selected / Selected	:	93% of modified AASHTO maximum density.
Lower selected	:	93% of modified AASHTO maximum density."

PSDM 5.2.8. Transport

Replace the contents of this subclause with the following:

"The provisions of Subclause PSD 5.2.5 of SABS 1200 D, as amended, shall apply."

“PSDM 5.2.9* Trimming and grading of verges

During the initial earthworks the verge width shall be cut or filled to approximately the final level and shall be kept trimmed and tidy during construction of the works. After completion of the road layers, including the premix surface, and after construction of the necessary kerbs, including the satisfactory backfilling behind the kerb, the verge shall be finished off to the lines and levels shown on the drawings or as specified.

The verge material shall consist of that material which would normally be occurring at that position or depth when in cut and shall not be contaminated by foreign materials such as bricks, basecourse material, horticulturally inferior materials from trench excavation, etc. Verges in fill conditions are to consist of the material as specified for the fills and similarly not be contaminated with foreign materials.

Over those sections of verge where grass is to be planted in which case the Contractor shall load, transport and spread as ordered by the Engineer. In the case of topsoil provided and imported by the Contractor the quality of the topsoil shall be approved of by the Engineer beforehand.

The Contractor shall be responsible for taking the necessary precautions and measures to control the dust nuisance which may arise due to his operations on the verge, whether from the natural ground surface or topsoil layer, until the verge is accepted by the Engineer.”

“PSDM 5.2.10* Dimension and Level Control and Process Control

The Contractor shall submit to the Engineer records of dimension and level control and/or process control prior to requesting the Engineer to carry out any routine tests and/or inspections.

A sample form can be obtained from the Engineer.”

“PSDM 5.2.11* Requesting of Tests

Tests and Inspections of the works will only be carried out by the Engineer once the appropriate test/inspection request forms have been fully completed. Test/inspection request forms can be obtained from the Engineer.”

PSDM 6 TOLERANCES

“PSDM 6.5* DIMENSION AND LEVEL CONTROL

The requirements of PSM 6.4 shall apply.”

PSDM 7 TESTING

PSDM 7.3 ROUTINE INSPECTION AND TESTING

Replace Table 2 and the contents of Clause 7.3.2 with the following:

“The dry density requirements for a particular lot of selected layer or wearing course shall be deemed to be satisfied if the average density and the results of individual tests meet the requirements specified in Table 2 below. Refer to Clause PSD 7.2 for the requirements for fill.

TABLE 2 - DENSITIES

1	2	3	4	5
Layer	Specified density (% of modified AASHTO density)	Number of tests per lot	Average density %	Minimum density for any single test, %
Upper selected	93	3 and 4 5 6	93,1 93,4 93,6	89,4 89,2 89,0

Lower selected layer or pioneer layer	93	3 and 4	93,1	89,4
		5	93,4	89,2
		6	93,6	89,0

"PSDM 7.4* INSPECTION AND TESTING BY ENGINEER

The requirements of PSM 7.3 shall apply."

PSDM 8 MEASUREMENT AND PAYMENT

PSDM 8.1 BASIC PRINCIPLES

Add the following:

"The requirements of PSM 8.2 shall apply. The Contractor shall further make provision in the various rates for the construction of the roadbed, fill and selected layer for the cost of his own process control testing and the cost of complying with PSDM 6.5 and PSDM 7.4."

PSDM 8.2 COMPUTATION OF QUANTITIES

Replace subclauses 8.2.1 through to 8.2.3 (inclusive) with the following:

"PSDM 8.2.1 The provisions of subclause 8.2.1 of SABS 1200 D shall apply.

PSDM 8.2.2 The provisions of subclause 8.2.2 of SABS 1200 D shall apply.

PSDM 8.2.3 The provisions of subclause 8.2.2 of SABS 1200 D shall apply."

PSDM 8.2.5 Verifying quantities

Replace the first sentence with the following:

"Before any earthworks are commenced but after completion of any site preparation, the Engineer will, upon a written request from the Contractor, provide cross-sections for the purpose of measurement of earthworks quantities."

PSDM 8.3 SCHEDULED ITEMS

PSDM 8.3.3 Treatment of roadbed

(a) Roadbed preparation and compaction of material to

Add the following:

"The unit of measurement shall be the cubic metre of material re-compacted as specified and the volume shall be determined from levelled cross-sections on which are superimposed the levels to which the roadbed is to be constructed. When material is imported to make up the required volume, such material will be paid for as cut or borrow to fill as relevant."

Note :

No additional payment will be made for difficult work or hand operations in confined areas."

Add the following to Clause 8.3.3(a) :

"(4) Minimum of 93% of modified AASHTO maximum densityUnit : m³

Add the following paragraph to the end of Clause 8.3.3(a):

“The unit of measurement shall be the cubic metre of material re-compacted as specified and the volume shall be determined from levelled cross-sections on which are superimposed the levels to which the roadbed is to be constructed. When material is imported to make up the required volume, such material will be paid for as cut or borrow to fill as relevant.

Note :

No additional payment will be made for difficult work or hand operations in confined areas.”

Replace the heading of subclause (b) with the following:

“(b) In-place treatment of road-bed in hard rock material by”

Add the following:

“(c) Three-pass roller compaction:

(i) Grid roller Unit: m²

(ii) Vibratory rollerUnit: m²

The units of measurement shall be the square metre of roadbed compacted as specified in subclause PSDM 5.2.3.3(c) for the areas designated by the Engineer.

The tendered rates shall include full compensation for shaping the areas, providing the rollers and compacting the roadbed by means of three roller passes over the entire area.”

PSDM 8.3.4 Cut to fill, borrow to fill

Replace the contents of this Clause with the following:

“(a) Cut to fill compacted to 93% of modified AASHTO maximum densityUnit : m³

The rate tendered shall cover the cost of excavating from the site as if in soft material, transporting, preparing, processing, shaping, watering, mixing, compacting to percentage of modified AASHTO maximum density specified, trimming and testing the fill.

(b) Borrow to fill from commercial or off site sources located by the Contractor compacted to 93% of modified AASHTO maximum density.....Unit : m³

The rate tendered shall cover the cost of acquiring the material from commercial or off site sources located by the Contractor, any excavation and selection required, loading, transporting to the point of use irrespective of distance, temporary stockpiling if necessary, placing, watering, compacting to percentage of modified AASHTO maximum density specified, trimming and testing the fill.

No additional payment will be made for difficult work or hand operations in confined areas.

Replace the heading and contents of Clause 8.3.5 with the following:

“PSDM 8.3.5 Selected layers

(a) Selected layers using material cut from the site and compacted to:

i) 93% of modified AASHTO maximum densityUnit : m³

ii) 95% of modified AASHTO maximum density.....Unit : m³

The rate tendered shall cover the cost of excavating as if in soft material, selecting, loading, transporting, placing, watering, compacting to percentage of modified AASHTO maximum density specified, trimming and testing the selected layer.

- (b) Selected layers using material from commercial or off site sources located by the Contractor, compacted to:
 - i) 93% of modified AASHTO maximum densityUnit : m³
 - ii) 95% of modified AASHTO maximum density.....Unit : m³

The rate tendered shall cover the cost of acquiring the material from commercial or off site sources located by the Contractor, any excavation and selection required, loading, transporting to the point of use irrespective of distance, temporary stockpiling if necessary, placing, watering, compacting to percentage of modified AASHTO maximum density specified, trimming and testing the selected layer.

Note :

No additional payment will be made for difficult work or hand operations in confined areas.”

PSDM 8.3.6 Extra over items 8.3.4, 8.3.5 and 8.3.16 for excavating and breaking down material in"

Replace the words "items 8.3.4 and 8.3.5" with the words "items 8.3.4, 8.3.5 and 8.3.16".

PSDM 8.3.7 Cut to spoil or stockpile from

Delete paragraph (b). In terms of PSDM 3.1 intermediate excavation will not be separately measured for payment.

Add the following:

"Separate items will be scheduled for cut to spoil and cut to stockpile. The rate tendered shall further cover the cost of complying with the requirements of Clause 5.2.3.2 irrespective of the depth or extent of the material ordered to be removed, or whether the order to remove unsuitable material is given after the completion of any initial cut operation.

The tendered rate shall further, in the case of cut to spoil, include full compensation for transporting the material regardless of the distance involved and for all other incidental cost to dispose of the spoil material. (Refer also PSD 5.2.2.3, PSD 5.2.5 and PSDM 8.3.12)."

PSDM 8.3.11 Extra over 8.3.2, 8.3.4, 8.3.5 or 8.3.7 for temporary stockpiling of material

Add the following:

The temporary stockpiling of material from commercial sources or borrow pits located by the Contractor will not be measured for payment."

PSDM 8.3.12 Overhaul

Delete this item as no overhaul will be paid on material for the purposes of this Contract and all the costs for transporting material shall be included in the applicable tendered rates and amounts.

PSDM 8.3.13* Surface finishes

"(a) Topsoiling Unit: m²

Measurement shall be the surface area of the topsoiling reinstated in accordance with the requirements of PSDM 5.2.9. The rate tendered shall cover the cost of all things necessary to reinstate the topsoil as specified, including the acquisition of material to make up for material lost due to weather or other reasons."

(b) Grassing or other vegetation cover Unit: m²

The rate shall cover the costs of finishing off areas to be landscaped. The rate tendered shall cover the cost of all things necessary to reinstate proposed landscaped areas as specified.”

Add the following new subclauses:

“(c)* Trim, shape and roll verge Unit: m²

Measurement shall be the surface area of the verge prepared in accordance with the requirements of PSDM 5.2.9. The rate tendered shall cover the cost of all things necessary to finish off the verge as specified, including the incorporation of material to make up for material lost due to weather or other reasons. (Cut and fill to bring verge to level payment under 8.3.4).”

(d)* Finishing of Cut and Fill slopes, medians and interchange areas Unit: m²

The rate shall cover the costs of finishing of cut and fill slopes, in terms of subclause 5.2.4.3 of SABS 1200 D.”

PSDM 8.3.17* Variations in the number of roller passes (applicable to sub-sub item 8.3.3(c)):

- (a) Vibratory rollers Unit: m²-pass
- (b) Oscillatory rollers Unit: m²-pass
- (c) Grid rollers Unit: m²-pass
- (d) Tamping rollers Unit: m²-pass
- (e) Impact rollers Unit: m²-pass
- (f) Pneumatic-tyred rollers Unit: m²-pass

The unit of measurement shall be the square-metre coverage, and shall be computed by multiplying the number of square metres to which the changed pass efforts apply by the increased or decreased number of roller passes.

Where a change in the compaction effort is requested, the Contractor will be compensated at the tendered rates for the above items in respect of the increased number of square-metre roller passes of each type of roller required over and above that specified in the relevant standard effort. His compensation will be decreased simultaneously, at the applicable rates, by the number of square-metre roller passes of each type of roller which is either decreased or completely left out.

The tendered rate for each additional square metre-pass ordered by the Engineer over and above the specified number of passes, shall include full compensation for all supervision, labour, plant, equipment, fuel, materials, work and incidentals necessary for completing the work. The same rates shall be accepted by the Contractor during computation of a decrease in his compensation where the number of roller passes for each specific type of roller is decreased.”

“PSDM 8.3.18* Reinforcement of soils.....Unit: m²

The tendered rates shall include full compensation for providing all labour, materials and equipment required to carry out the work, for all preparatory work, for installing the reinforcement scheduled in a workmanlike manner. Refer to PSDM 3.2.5.”

PSG CONCRETE (STRUCTURAL) (SABS 1200 G)

PSG 2 INTERPRETATIONS

PSG 2.1 Supporting Specifications

Add the following:

SABS 1491 Part I : Ground Granulated Blastfurnance Slag (GGBS)
SABS 1491 Part II : Pulverised Fly Ash (PFA)
SABS 1491 Part III : Condensed Silica Fume (CSF)

PSG 2.3 Definitions

Under (a) add:

“Constructional joint: a joint required on account of constraints or convenience in the method of construction and that is not a movement, contraction or expansion joint.”

PSG 2.4.1 Exposure Condition

All concrete on the Works shall be as specified for severe exposure condition.

PSG 2.4.2 Strength Concrete

Mix 35 Mpa/20 means strength concrete Grade 35 Mpa with 20 mm stone.

PSG 2.4.3 Joints

Notwithstanding Subclause 2.4.3, “designated joints” will only be joints that are shown on the drawings. Any other joints that are required by the Contractor as a result of his construction constraints or for any other reason, whether approved by the Engineer or not, will not be considered to be designated joints as defined in Subclause 2.4.3, i.e they will be considered to be “non-designated” joints.

PSG 3 MATERIALS

PSG 3.2.1 Applicable Specifications (Subclause 3.2.1)

Delete the paragraph and replace with the following:

Ground granulated blast furnace slag (GGBS) used on the Works shall be from a source to be approved by the Engineer and shall comply with the requirements of SABS 1491 Part 1, as amended Pulverised Fly Ash (PFA) used on the Works shall be from a source to be approved by the Engineer and shall comply with the requirements of SABS 1491 Part II, as amended.

Condensed Silica Fume (CSF) used on the Works shall be from a source to be approved by the Engineer and shall comply with the requirements of SABS 1491 Part III, as amended.

Unless otherwise specified no other cement other than cement types CEM I, CEM II/A-S, CEM II/B-S, CEM II/A-V or W, CEM II/B-V or W, and CEM II/A-M shall be used without written consent of the Engineer first being obtained.

PSG 3.2 Cement (Subclause 3.2)

All cement used in the Works shall be Portland cement complying with SABS 471, unless noted otherwise for specific items.

PSG 3.2.3 Storage (Subclause 3.2.3)

Unless approved by the Engineer, cement kept in storage for longer than 8 weeks shall not be used in the Works.

PSG 3.3 Water (Subclause 3.3)

Only potable water from an approved source may be used for mixing concrete.

Water from a river or stream may however be used for curing.

PSG 3.4 Aggregate (Subclause 3.4)

Both the coarse aggregate (stone) and the fine aggregate (sand) shall comply with the relevant requirements of SABS 1083.

The nominal stone size specified in the concrete grade (e.g 30 Mpa/40 mm) shall mean stone conforming to the grading specified in SABS 1083 for the nearest equivalent size, i.e 40 mm means stone that complies with SABS 1083 for 37,5 mm size.

Concrete using reactive aggregates (Subclauses 3.2 and 3.4)

The Contractor shall provide the Engineer with sufficient data to enable him to assess the degree of alkali-aggregate reactivity of the aggregates to be used for concrete.

Where reactive aggregates such as Malmesbury Group aggregates, and certain Table Mountain Formation and other quartzitic aggregates are used for concrete, the Contractor shall, in order to ensure that the concrete is not subject to alkali-alkali content such that the total equivalent sodium oxide content of the concrete is less than 2,8 kg/m³.

(NOTE: The equivalent sodium oxide content (alkali content) is measured as (Na₂O + 0,658 K₂O). for cement it is expressed as a percentage by mass, for concrete it is expressed in kg/m³).

In the case of other aggregates that are less reactive the Engineer will determine the type and degree of precautionary measures to be adopted.

Before casting any concrete the Contractor shall provide acceptable evidence that the requirements of this clause are being met.

PSG 3.4.2 Use of Plums (Subclause 3.4.2)

The use of plums will not be permitted.

PSG 3.5.1 Admixtures (Subclause 3.5.1)

The use of admixtures will be subject to the approval of the Engineer. The unformatted listed in Subclause 3.5.1 shall be approved.

PSG 3.9 Joint Materials (New Clause)

The joint materials shall be resistant to ultraviolet light and to biological degradation.

PSG 3.10 Concrete (New Clause)

Concrete for the blinding layer, manhole bases and the surround to pipes shall be grade 15/19.
Concrete for the structure shall be grade 35/19.

Site Batching

For grade 35/19 concrete, cement types CEM I (OPC, Duratech), CEM II /A (Eagle Plus), CEM II/B FA (Structcrete, Durastruct, Surecrete) shall be used. No site blending of cement extenders will be permitted without the permission of the Engineer.

Ready Mixed Concrete

For grade 35/19 concrete, a CEM I or CEM II cement and pulverised fly ash (PFA) may be blended together such that the combined cementitious material comprises a minimum of 65% CEM I or CEM II cement and a maximum of 35% PFA by mass. Alternatively, for grade 35/19 concrete, a CEM I or CEM II cement and ground granulated blastfurnance slag (GGBS) and/or condensed silica fume (CSF) may be blended together such that the combined cementitious material comprises a minimum of 65% CEM I or CEM II cement and a maximum of 35% GGBS and/or CSF by mass.

The minimum combined cementitious material shall not be less than 375kg and not more than 450kg per cubic metre. Minimum cement/water ratio shall be 2.0.

PSG 3.11 Polythene Sheeting (New Clause)

Polythene sheeting, where specified on the drawings, shall be in accordance with SABS 952.

PSG 3.12 Water stops (New Clause)

Water stops, where specified on the drawings, shall be manufactured from virgin polyvinyl chloride (PVC) that complies with the following minimum performance requirements:

Tensile strength	12, 2Mpa (min)
Elongation at break	25% (min)
Water soluble content	0,15% (max)
Softness (BS 2571)	38 to 50

Water stops shall be 150mm wide. The water stops in the floor joint will be the rearguard type "Expandite Supercast Rearguard R" or similar approved and in the walls will be the dumb-bell type "Expandite Supercast Waterfoil" or similar approved.

PSG 3.13 Joint Fillers (New Clause)

Joint fillers, where specified on the drawings, shall be of resin bonded cork board having a maximum water absorption of 3% by volume and complying with ASTM D 1752 with regard to recovery, extrusion, expansion and compression.

PSG 4 PLANT

PSG 4.3 Mixing Plant and Vibrations (Subclause 4.3 and 4.4)

Standby mixers and vibrators of adequate capacity and with an independent power unit shall be maintained on the site for immediate use in the event of breakdown of the regular mixers or failure of the power supply.

PSG 4.5.3 Formwork Ties (Subclause 4.5.3)

The use of sleeves for formwork ties through the walls of water-retaining structures will not be permitted. Ties, when cast in, shall have some form of positive anchorage to prevent any rotation when loosening formwork.

PSG 4.6 Formwork: Chamfers and Fillets (New Clause)

All internal and all exposed external angles in concrete work shall have 20 mm x 20 mm fillets and chamfers respectively unless otherwise specified or ordered. The top edge of the slab that is to receive an applied finish shall not be chamfered.

PSG 5 CONSTRUCTION

PSG 5.1 REINFORCEMENT

PSG 5.1.2 Fixing (Subclause 5.1.2)

The welding and the use of heat in cutting high tensile deformed bars (Y bars) shall not be permitted without the approval of the Engineer.

PSG 5.3 Cover (Subclause 5.1.3)

In Subclause 5.1.3(a) amend the words "... or stirrup" to read: "bar, secondary reinforcement, tie stirrup, tying-wire knots or wire ends".

Add to Subclause 5.1.3 : “Tying wire may not encroach on the specified minimum cover by more than a single strand thickness”.

The reinforcement shall be fixed with the minimum cover as specified on the drawings, or as indicated in the following table:

Type of Construction	Min. Cover, mm
1. <u>Slabs and Walls</u> a) Plastered and un-plastered internal work b) Exposed to water pressure c) External walls d) Exposed to backfill or corrosive atmosphere	The greater of 20 or d
Type of Construction	Min. Cover, mm
2. <u>Columns</u> 3. <u>Beams</u> a) End cover beyond hooks b) All other surfaces	The greater of 40 or d The greater of 25 or 2d The greater of 25 or d
4. <u>Piles</u> a) Precast piles and or faces poured against formwork b) On unformed faces poured against ground	40 75
5. <u>All structures in sea water or in marine atmosphere</u>	50
6. <u>Structures in contact with backfilling or corrosive atmosphere</u>	50
7. <u>Footings</u> a) Members cast on a blinding layer b) Members cast in contact with the ground	50 75

In the case of walls and roof slabs, the minimum specified cover shall be attained by one of the following methods, or as approved by the Engineer.

- i) by using "cover blocks" manufactured from dense, strong cement/sand formed in a block with wire ties, cured under water for a minimum period of 7 days.
- ii) by the use of plastic spacers, set in an orientation so that no pockets of air can be trapped beneath them during vibration of the concrete.

PSG 5.1.6 Spacers (New Clause)

Spacers of approved design include approved plastic or other proprietary spacers, or purpose made precast mortar blocks.

The tie wires cast into the spacer blocks shall be fully galvanised, Class A as per SABS 675-1993.

Where mortar blocks are used they shall be properly shaped (60 x 60 mm) so as not to slip out of position and shall be made of the same mix as the mortar of the concrete in which they are to be placed. The mix design for the spacer blocks shall be submitted to the Engineer for approval and no spacer blocks shall be cast until the mix design for the spacer blocks has been approved. The mortar shall be accurately batched and well compacted by means into the moulds to result in blocks free from honeycombing, with a density of at least 2300 kg/m³ and with a durability matching that of the parent concrete. The mortar blocks shall be cured in water for at least 7 days.

Mortar blocks which have not been manufactured and cured strictly in accordance with these requirements, or which are in any other way considered unsatisfactory by the Engineer, will be rejected and shall be removed from the Site.

PSG 5.2 FORMWORK

PSG 5.2.1 Classification of Finishes (Sub-Clause 5.2.1)

Notwithstanding Sub-Clause 5.2.1 finishes shall be classified as rough or smooth, as follows:

(a) A rough finish shall be obtained from formwork constructed of sawn timber, plywood, steel panels or other approved materials arranged without particular regard to pattern or the smoothness of the concrete surface.

(b) A smooth finish shall be obtained from formwork constructed of planed timber, plywood, good quality steel panels or other approved materials all with close fitting square edges arranged in neat uniform patterns and imparting a smooth uniform surface to the concrete. The surface classification is Class 2 – Rubbed Finish.

PSG 5.2.2 Design of Forms

- i) Forms shall conform accurately to the shape, lines, levels and dimensions of the concrete as shown on the drawings.
- ii) The design of the formwork and supports shall be the responsibility of the Contractor and shall be designed and detailed by a registered professional engineer, if required by the special conditions of contract, and submitted for approval by the Engineer.
- iii) Forms shall be so designed as to support their self mass, the load exerted by the wet concrete and by the vibration, construction or other loads to which they may be subjected. Where the concrete is to be prestressed, the formwork shall be constructed in such a manner that the elastic compressive shortening of the concrete during the tensioning of the tendons is not unduly hindered. The maximum deflection of any formwork component shall in no case exceed 1/360th of its span. Form soffits shall be built to a camber corresponding to their probable deflection under load so that the finished concrete shall conform accurately with the lines and dimensions shown on the drawings.
- iv) The inner faces of forms shall be such as will impact the specified finish to the concrete. Solid steel forms may be used for precast beams and circular columns. Elsewhere, except where otherwise specified or the written consent of the Engineer has been obtained, only wrought timber or approved shuttering boards shall be used for forms in contact with exposed concrete faces.
- v) All timber shall be free from holes, loose knots, cracks, splits, warps or other defects likely to affect the strength or appearance of the finished structures.
- vi) Wedges and clamps shall be used in preference to nails for securing the form components and wire ties or tie bolts in reinforced concrete must be capable of complete removal after use, except as otherwise specified.
- vii) In the cases where the accommodation of traffic during the construction period is required, false work shall be designed to span underlying road systems with a minimum headroom of 5,0m unless otherwise specified.

PSG 5.2.3 Cleaning Before Concreting

All dirt, sawdust, chips and other foreign matter shall be removed from between the forms before any concrete is deposited

PSG 5.2.5 Removal of Formwork (Sub-Clause 5.2.5)

Add the following:

Removal of forms shall be determined by means of cubes cast with the concrete and cured in accordance with the S.A.B.S. 863. The removal shall be carried out under the personal supervision of the Foreman only after the permission of the Engineer has been obtained and in such a manner that the concrete is not jarred, vibrated or otherwise damaged.

Where test cubes to determine stripping times are not made, the minimum periods which shall elapse between the time of the placing of the concrete and the time of removal of the forms shall, unless otherwise agreed with the Engineer, be in accordance with the table hereunder, where each day covers a full 24 hour period.

Delete Table 2 and replace with the following:

Minimum Stripping Time in Days

*Average daily temperature of the atmosphere adjacent to the concrete as measured by a maximum and minimum thermometer. When the average daily temperature is between 5°C and 15°C the minimum stripping times shall be interpolated from the Table.

The table assumes that the member concerned is not subjected to any heavy construction loads and that the total force to be supported is not more than half the design load. Where heavier loads are to be carried, no stripping of soffits shall be permitted until the concrete has attained its full strength. Any days during which the average temperature was below 2°C shall be completely disregarded.

PSG 5.4 Pipe Box-Outs

Unless otherwise shown on the drawings, the infill to pipe box-outs shall be constructed as follows:

- a) Reinforcement shall be cut at centre of box-out and bent around pipe.
- b) Existing concrete shall be scabbled to expose sound concrete and all loose material removed.
- c) Concrete surfaces shall be saturated with water for 24 hours, and a cement/sand slush applied prior to concreting the infill.
- d) Infill concrete shall be grade 30 MPa with nominal 13 mm stone, have a slump of 100 mm, and be well compacted.

PSG 5.5 CONCRETE

PSG 5.5.1.1 General (Subclause 5.5.1.1)

The concrete mix design for strength concrete must be prepared in an approved laboratory and the results of actual test mixes must be submitted for approval together with 7-day and 28-day strength test results. Special attention is drawn to the fact that the concrete mix must provide a very dense and impervious concrete.

No concrete shall be cast until the mix designs have been approved by the Engineer. The Engineer may call for revised mix designs at any stage during the Contract.

PSG 5.5.1.4 Chlorine Content (Subclause 5.5.1.4)

With reference to Table 4, efflorescence will not be acceptable on any exposed concrete surface.

PSG 5.5.1.7 Strength Concrete (Subclause 5.5.1.7)

All concrete for the Works shall be considered to be strength concrete in terms of Subclause 5.5.1.7. No concrete shall be cast until the mix designs have been approved by the Engineer. The Engineer may call for revised mix designs at any stage during the Contract.

PSG 5.5.2 Batching (Subclause 5.5.2)

Batching of strength concrete shall be by mass.

Concrete from a central concrete production facility (Subclauses 5.5.3.2 and 7.3)

Concrete from a central concrete production facility other than on the Site of construction will be permitted and test results obtained by such a production facility as part of its quality control system are acceptable for evaluation in terms of Subclause 7.3.

Casting of concrete in excavation (Subclause 5.5.5)

Structural concrete shall not be cast directly against the side of any excavation without the use of formwork unless prior approval has been obtained in writing from the Engineer.

Concrete used in pipe trenches for encasement may be cast directly against the side of the excavation. Concrete for thrust/anchor blocks shall be cast directly against the side of the excavation.

PSG 5.5.3.2 Ready-Mixed Concrete (Sub-Clause 5.5.3.2)

The Contractor may elect to use ready-mixed concrete subject to the prior approval of the Engineer.

Ready-Mixed concrete shall not be delivered to site before the Contractor has furnished the Engineer with a copy of his letter to the Supplier in which he has included the following:

- i) The compressive strength of concrete at twenty-eight days.
- ii) The nominal maximum size of aggregate.
- iii) The type of cement.
- iv) The required slump at the point of delivery; being the site; and
- v) An instruction to the Supplier to provide details of the admixture proposes to use, if applicable.

The Contractor shall have delivered with each truck load of ready-mixed concrete a delivery note from the Supplier on which the following information is noted:

- i) The compressive strength of the mix.
- ii) The actual concrete mix proportions.
- iii) The slump.
- iv) The time at which water was added to the mix.
- v) The time of arrival of the truck on site.
- vii) The time the concrete discharge is completed, and
- viii) The quantity of concrete supplied.

These delivery notes are to be kept on site, being available for inspection at any time.

A maximum delivery period of 90 minutes from the time water is added to the concrete mix to the actual discharge of concrete on site shall be permitted. The discharge period including placing of the concrete shall not exceed 30 minutes.

The use of ready-mixed concrete shall in no way relieve the Contractor of any of his responsibilities for providing concrete complying with the specifications.

PSG 5.5.7 Construction Joints (Subclause 5.5.7)

a) General

The edge of joints, exposed to view in the finished structure, shall be formed with suitable beads to provide a straight edge true to line and level.

As soon as practical, but not before 15 hours after placing, the construction joint surface shall be prepared to receive fresh concrete. This preparation, as specified in 5.5.7.3(a) to (d), shall be such as to remove all latency or inert and strengthless material which may have formed and the specified chipping or sand blasting shall be such as to produce a roughened surface all over.

When concreting is interrupted concrete surfaces shall be protected from the sun as specified in Subclause 5.5.8(d) or by means of hessian kept damp until concreting is resumed.

All constructional joints (both designated and non-designated, see PSG8.1.4), (i.e all joints other than movement, contraction and expansion joints) shall be dealt with as specified in Subclause 5.5.7.3.

Unless construction joints between designated joints shown on the drawings are authorized by the Engineer in writing, concrete in the floor and wall shall be cast continuously between the designated joints shown on the drawings.

Only the joints indicated on the drawings shall be deemed designated joints.

Should the Contractor wish to introduce additional joints to facilitate his construction procedure, such joints shall be deemed non-designated joints and shall be in positions and of types as approved by the Engineer.

b) Formed Joints (Generally vertical or near vertical)

Formed joints will be considered to be designated joints as defined in Subclause 2.4.3.

Each joint shall be formed as shown on the drawings, complete with shear key rebates, waffle formwork, V-feature, waterstops, "Flexcell" or similar joint filler, dowel bars and their PVC tubes, etc as indicated.

c) Non-designated Joints

Any non-designated joints shall be identical to designated joints, as shown on the drawings, which would be used in similar positions and perform the same function.

d) Unformed Joints

Unformed joints, whether shown on the drawings or not, whether ordered by the Engineer or not, will not be considered to be designated joints as defined in Subclause 2.4.3.

e) Joints between floors and walls and pillars

Construction joints between foundations or footings and walls, or piers standing on them, shall not be made flush with the supporting surface, but shall be made at a distance above the floor or footing on the drawings or approved by the Engineer. The "kicker" (starter stub) shall be cast as an integral part of the bottom, floor or footing.

f) Fibreboard

Fibreboard shall be provided between concrete sections wherever shown on the Drawings. Fibreboard shall be impregnated and treated with a special bituminous compound to protect it from weathering e.g. "Flexcell", as manufactured by Fosroc (Pty) Ltd or a similar approved board of comparable composition, which shall be securely fixed in position to avoid distortion or displacement while concreting operations are in progress.

g) Joint Former

Joint former for use in joints shall be approved by the Engineer. It shall consist of a highly resilient closed cell polymer foam (the resiliency shall not be less than 90% recovery after compression to half original thickness), capable of giving effective support to sealing compounds in movement joints, and able to withstand permanent immersion in water without disintegration.

Minimum required specifications:

- Normal density : 100
- Elongation at break point : 98%
- Tensile strength at 70% : 782kPa
- Tear strength of width : 5.4N/mm

h) Waterstops

Polyvinyl chloride (PVC) and/or rubber waterstops shall be of approved manufacture and shall be provided with lugs and fixing. The minimum elongation at break point shall be 360% at 25°C. In the case of PVC waterstops, regenerated PVC will not be accepted. The waterstops shall be of the size and shapes shown on the drawings and as scheduled. Prior to use all waterstops shall be carefully stored to avoid damage or contamination by oil, grease, the sun etc.

i) Polyurethane Joint Sealants

The joint sealant shall be a two component polyurethane complying with SABS 110/73 and the cured material shall have the following properties :

(i) a service temperature range of -50°C to +80°C

(ii) it shall not flow

(iii) hardness shall be ± 25 Shore A (by method 6.12.2.1 of SABS 110-73)

(iv) movement must never exceed 25% of neutral width of joint

(v) adhesion to the specified surface shall be such that failure takes place within the material and not at the contact face

(vi) it shall not be affected by sewage, water, dilute acids and alkalis, fats, vegetable oils and petroleum products

(vii) it shall be extremely resistant to atmospheric oxidation

Surface preparation : Before the joint sealer is applied, the surfaces of the joint shall be thoroughly cleaned and primed in accordance with the manufacturer's instructions.

Approval : Before any joint sealers are applied, approval by the Engineer in writing shall be obtained. The material shall be applied strictly in accordance with the manufacturer's instructions and any cleaners or primers applied as required.

j) Joints with Waterstops

Where shown on the Drawings, joints shall be formed in concrete work embodying waterstops embedded in the concrete. It is essential that the waterstops are held securely during concreting by using suitable shuttering and a clamping device for holding the waterstop in position, nailing not being permitted except through the lugs provided for the purpose. The concrete adjacent to the waterstop shall be carefully placed and compacted to avoid honeycombing and to ensure full contact between the waterstop and the adjacent concrete.

After one half of the waterstop has been set into concrete and before the concreting of the succeeding section is commenced, the faces of the concrete against which the succeeding section is about to be cast shall be thoroughly cleaned by brushing with a wire brush, care being taken not to damage the waterstop.

k) Movement Joints

Joint recesses to receive sealing compound are to be formed to the dimensions and shapes indicated on the Drawings. These recesses are to be formed with rough sides and so shuttered that the shuttering can be removed without any timber having to be left in the recesses. Shuttering shall be left in the joints until the joints are ready for priming and filling with sealant. After the removal of the shutters, joints shall be cleaned by mechanically operated wire brushes and all dust removed.

l) Sealing Joints

The sealing of the expansion joints is to be carried out by the Contractor under the supervision of a representative of the specialist firm supplying the sealing compounds and materials. The Contractor is to be responsible for supplying these approved materials, transporting them to site, storing and using them as required, and providing all labour, tools, equipment and everything necessary to prime and fill the joints.

Before priming and sealing, the joints are to be thoroughly cleaned and dried out by a method approved by the Engineer.

No sealing of joint recesses is to be carried out until at least 21 days after the adjacent concrete has been cast. Every care shall be exercised by the Contractor to ensure that the work shall be carried out in accordance with the requirements of this Specification and in strict conformity with any special instructions given by the manufacturers for the proper use and treatment of the sealing materials provided by them.

All internal joints in the floors and the external joints in the roof shall be sealed either with an approved sealant or alternatively, if instructed by the Engineer, with a 190 mm wide butyl rubber strip of 3 mm nominal thickness (Expoband or similar approved) consisting of two laminations, one layer being fully vulcanised rubber and the other layer being unvulcanised rubber.

The concrete surface onto which the butyl rubber strip is to be laid must be sound, dry and dust free and must be fully cured and free from curing compound. The concrete surfaces on either side of joints shall be finished smooth and level and free from all dirt, dust, laitance, loose material and irregularities with no vertical misalignment between each side of the joint to be sealed. Any portions that are not so finished shall be ground down at the Contractor's expense. The butyl rubber strip is to be installed strictly in accordance with the manufacturer's instructions and adhered to the concrete surfaces so as to form a permanently watertight joint.

Payment for the construction joints shall be measured per linear metre for the various types of construction joints. The rate shall include for all shuttering at the joints, scabbling of the concrete surface and the supply and installation of either an approved sealant or a butyl rubber strip, adhesive, and everything necessary to achieve the objective of a watertight joint.

PSG 5.5.8 Curing and Protection (Subclause 5.5.8)

a) Curing compound

The use of membrane curing compounds will be allowed on vertical faces or steeply inclined faces (i.e steeper than 45° to the horizontal) of cast in-situ members of the structures subject to the Contractor producing sufficient, satisfactory cube crushing strength test results where the crushing strength of cubes which have been cured with the proposed membrane shall be at least 85 % of the crushing strength of the water cured cubes.

Before any membrane curing compound is used, each batch shall be tested on a trial surface to ensure that it forms a satisfactory membrane, and any compound which is unsatisfactory in the opinion of the Engineer, shall be rejected. Curing membranes will be disallowed if permanent discolouration of the concrete takes place. Surfaces where curing membranes are used shall be treated in such a manner that the final concrete texture and colour blends in with the rest of the concrete work. Furthermore, the Engineer shall, at his discretion, require the Contractor immediately to adopt an effective alternative means of curing any area of the structure to which a membrane has been applied which, in the opinion of the Engineer is unsatisfactory. The curing compound used shall be to the approval of the Engineer. Wax based curing compounds will not be permitted.

PSG 5.5.9.2 Hot-weather Conditions (Subclause 5.5.9.2)

No placing of concrete shall take place if the ambient temperature exceeds 32°C, or is likely to rise to above 32°C during the casting period or within eight hours after casting is completed.

If concrete is to be cast during times of high ambient temperature or hot drying winds, the Contractor shall be responsible for taking the necessary steps to keep the placement temperature as low as possible. Such steps include the spraying of the course aggregate with water, the painting of silos with a reflecting aluminium paint, the insulation of tanks and pipelines, and the protection of concrete ingredients against the direct rays of the sun. The area of the pour shall be shaded before and during concreting and the concrete shall be shaded from the time of mixing until eight hours after placing. Wind breakers shall be erected if necessary.

PSG 5.5.9.2 Prevention and Repair of Plastic Shrinkage Cracks

The Contractor shall take whatever measures are necessary to prevent plastic shrinkage cracking in the concrete. Particularly on dry windy days or hot sunny days the Contractor shall make provision for fine spraying of the concrete surface with water within one hour of casting or covering of the concrete with black plastic sheeting. It may be necessary to change the aggregate or the concrete mix proportions.

If plastic shrinkage cracking occurs, the cracks shall be closed up by re-vibrating the concrete with a poker vibrator, within about three hours of casting. Once the cracks have been closed, the concrete shall be kept thoroughly wet, or covered with plastic sheeting for at least a further three hours.

PSG 5.5.10 Concrete Surfaces (Subclause 5.5.10)

a) Screeded Finish

After placing and compacting, the concrete on a top (unformed) surface shall be struck off with a template to the designated grades and tamped with a tamping board to compact the surface thoroughly and to bring mortar to the surface, leaving the surface slightly ridged but generally at the required elevation. No mortar shall be added, and noticeable surface irregularities caused by the displacement of coarse aggregate shall be made good by rescreeding after the interfering aggregate has been removed or tamped.

b) Wood-Floated Finish (Subclause 5.5.10.1)

Where wood-floating is ordered or scheduled, the surface shall first be given a finish as specified in PSG 5.13.1) (Subclause 5.5.10.1) and, after the concrete has hardened sufficiently, it shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface free from screeding marks.

c) Steel-Floated Finish

Where steel-floated is specified or scheduled, the surface shall be treated as specified in PSG 5.13.1) except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screeded surface shall be steel-trowelled under firm pressure to produce a dense, smooth, uniform surface free from trowel marks.

d) Power Float Finish

Where power floating is specified or scheduled the surface shall be treated as specified in PSG 5.13.2) except that when the moisture film has disappeared, and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screeded surface shall be power floated to produce a dense, smooth and uniform surface free of all trowel marks. In corners and areas of restricted access the concrete surface shall be finished by steel floating in accordance in PSG 5.13.2).

The timing of power-floating is critical to its success. Power-floating steel shall not commence until the concrete can support the weight of a man without indentation and until the moisture sheen has disappeared. Thus several hours will have to elapse after concreting has been completed before this operation can commence. Night work may therefore be required.

PSG 6 TOLERANCES

PSG 6.1 Permissible Deviations (Subclause 6.1.1)

Degree of Accuracy II shall apply except that abrupt changes in a continuous surface shall not be more than 3 mm.

PSG 7 TESTS

PSG 7.1 Frequency of Sampling (Subclause 7.1.2)

One sample shall consist of three concrete test cubes.

For each sample taken the position in the structure shall be recorded where the batch represented by that sample is placed.

Sampling of concrete of a particular grade shall be as specified in Subclause 7.1.2 with the following frequency of sampling referred to in Subclause 7.1.2.2 being amended to read as follows:

“A minimum of 4 samples per day of each grade of concrete placed or 6 samples for pours in excess of 10 m³ shall be taken”.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1 Reinforcement (Subclauses 8.1.2.2 and 8.1.2.3)

Notwithstanding the method of measuring and paying for reinforcement specified in Subclauses 8.1.2.2 and 8.1.2.3, reinforcement will be measured and paid for as scheduled.

PSG 8.1.3.3 Concrete (Subclause 8.1.3.3)

The rates for concrete shall also cover:

- a) the cost of meeting the requirements of PSG 3.4,
- b) the cost of the preparation of design mixes by an approved laboratory and submission for approval by the Engineer.
- c) The cost of non-designated joints (see PSG 2.4)
- d) Screed finish of unformed surfaces as specified in PSG 5.13.2), and
- e) Wood-floated finish to exposed surfaces as specified in PSG 5.13.2).

PSG 8.2.7 Formwork (New Clause)

Edges of blinding layer and filling of overbreak in hard rock

No separate payment will be made for formwork to the edge of the blinding layer, nor for the filling-in of overbreak in hard rock. The rates tendered for concrete to the blinding layer shall cover the cost of such formwork and extra concrete needed to fill in the overbreak.

PSG 8.2.8 Kickers (New Clause)

Formwork to the edges of kickers will be measured with the formwork for the portion of the structure for which they provide the start (not as narrow widths).

Unformed surface finishes (Subclause 8.4.4)

The rates for unformed surface finishes shall cover the cost of providing the respective surface finish as specified in PSG 5.13.

PSG 8.5 Joints (Subclause 8.5)

Only designated joints as shown on the drawings will be measured for payment according to the length of each of joint constructed (see PSG 2.4).

The rate shall cover the cost of all materials, labour and plant required to construct each type of joint specified on the drawings, including the cost of all shuttering, treatment of the joint as specified in Subclause 5.5.7.3, the provision of chamfers as specified where concrete is exposed, as well as testing and repairing where necessary.

Non-designated joints will not be measured for payment.

PSGA **CONCRETE (SMALL WORKS)**

PSGA 3 **MATERIALS**

PSGA 3.2.1 Applicable Specifications

Add the following to this Subclause:

“Notwithstanding the contents of this Subclause, where reference is made in this specification or the standard specifications to any cement specification, it shall be replaced with the following specification, SANS EN 197-1-Cement-Part 1: Composition, specifications and conformity criteria for common cements.

On this Contract cement grade CEM I 42,5N shall be used.”

PSGA 3.8 **CURING COMPOUND**

Curing compound shall be white pigmented natural resin based liquid curing compound complying with ASTM C 309 Type 2 Class B.”

PSGA 4 **PLANT**

PSGA 4.4.2 Finish

The finish to all exposed concrete shall be smooth and that to buried or backfilled surfaces, rough.

PSGA 5 **CONSTRUCTION**

PSGA 5.4 **Concrete**

PSGA 5.4.1 Quality

PSGA 5.4.1.5 **Strength Concrete**

Add the following:

“The Contractor shall, when requesting approval of a mix design, submit the constituent proportions of the proposed mix together with the results of compressive strength tests carried out. Reliable test records made from the same materials and mix proportions will, without prejudicing the requirements of this subclause, be accepted as a basis for approving a mix design”.

PSGA 5.4.2 Batching

Notwithstanding the requirements of this subclause, the method of batching shall be subject to approval. If volume batching is allowed only full standard 50kg bags of cement may be used to make up a batch.

PSGA 5.4.3 Mixing

Add the following:

“All site mix concrete shall be mixed in a rotary type mixer and the minimum size of mixer that may be used shall have the capacity to mix a batch comprising one standard 50kg bag of cement”. (SANS ENV 197 CEM 1 42.5 Black bag.)

PSGA 5.4.6 Compaction

Replace “or (if approved).....forking” in the first sentence of subclause 5.4.6.3 with “using approved vibrators”.

PSGA 5.4.7 Curing and Protection

Notwithstanding the requirements of this subclause, all cast insitu concrete shall be cured in accordance with the requirements

of this subclause using a white pigmented natural resin based liquid curing compound complying with ASTM C 309-74, except where the surface to be cured is to receive further concrete, in which case curing shall be carried out in accordance with one of the methods described in subclause (a) and (b).

PSGA 7 TESTS

PSGA 7.1 Facilities and Frequency of Sampling

PSGA 7.1.2 Frequency and Sampling

Notwithstanding the requirements of this subclause the Contractor shall take note that he is responsible for taking an adequate number of tests to ensure that the concrete being used complies with the Specification. The Engineer's Representative will only carry out such check testing as he requires.

PSGA 8 MEASUREMENT AND PAYMENT

Delete the contents of this Clause. Measurement and Payment would be done in accordance with the Standard Preambles.

PSL MEDIUM PRESSURE PIPELINES

PSL 1 SCOPE

PSL 1.1 *Add the following:*

"This specification shall also cover the installation of the cross-connection and pipework inside the tower."

PSL 2 INTERPRETATIONS

"PSL 2.1.3* Drawings

Wherever the aforementioned drawings are referred to, the appropriate of the details shown on the Employer's Agent Drawings shall apply."

PSL 2.4 ABBREVIATIONS

Add the following:

"HDPE: High Density Polyethylene."

PSL 3 MATERIALS

PSL 3.3 CI PIPES, FITTINGS AND SPECIALS

Add the following:

"CI fittings and specials for use with uPVC pipes shall be class 16."

"PSL 3.7.3* uPVC pipes

uPVC pipes and fittings shall be provided with spigot and socket rubber ring joints and shall be manufactured to standards acceptable to the Employer's Agent. Solvent welded fabricated fittings will not be acceptable."

PSL 3.8.3 Flanges and accessories

Add to Subclause 3.8.3:

"The insertion piece shall be such as to cover the full face of the flange (i.e. the O/D). Drilling shall conform to SABS 1123/1600/3.

PSL 3.8.4 Loose flanges

Bolts and nuts shall comply with SABS 135.

PSL 3.9.1 CI pipes and specials

Notwithstanding the provisions of this subclause, all CI pipes, fittings and specials shall be coated internally and externally using "Rillsan". The coating shall be 250 – 300 microns thick and shall be applied by an approved applicator.

PSL 3.9.2 Steel pipes

Notwithstanding the provisions of this Sub-Clause, all steel pipes and specials to be installed shall be heavy duty hot dipped galvanized complying with the requirements of SABS ISO 1461 and shall **not** be passivated.

After the galvanizing process, all steel pipes and specials shall be cleaned, scrubbed and washed down firstly with a suitable solvent and then with clean water. Immediately thereafter, the pipes and specials shall be internally and externally coated as scheduled below, all in accordance with the manufacturer's instructions.

Coat	Product	DFT (µm)		
		Min	Nominal	Max
1	Holding Primer Sigmacover or approved equivalent	45	50	75
2	Sigma TCN 300 (Brown) or approved equivalent	125	150	175
3	Sigma TCN 300 (Black) or approved equivalent	125	150	175
Total DFT		295	350	425

All coats shall be in contrasting colours and no DFT reading may be less than nor more than the minimum and maximum values specified. The overall average DFT shall not be less than the nominal DFT specified.

Application shall be by airless or conventional pressure pot spray systems and thinners shall be used strictly in accordance with the manufacturer's instructions. All critical areas like edges and welds shall be given an extra stripe coat.

Note:

The drilling patterns for flanges shall be SABS 1123/NP1600/3 and all pipes, specials and fittings shall be supplied complete with all necessary stainless steel bolts, washers and nuts as well as appropriate insertion pieces applicable to diameter and material.

All stainless steel items shall be Grade 316 material.

Fabrication of austenitic stainless steels shall comply with the recommendations in "The Stainless Steel User Manual" issued by Columbus Stainless. Compliance with publications from equivalent authorities will be acceptable.

Stainless steel fabricators shall use permanently dedicated storage and fabrication areas and shall use machines, tools and handling equipment which are suited and permanently dedicated to this type of material.

Fabrications shall be pickled and passivated over their full surface to achieve an even colour. If grinding is required before pickling, the final grinding shall be done with a fine disc in order to remove coarse grinding marks.

PSL 3.9.6 Corrosive soil

All buried flanged joints, together with their bolts, shall be protected by means of "Denso" paste and then wrapped to give a covering of at least three layers of "Denso" impregnated tape, or other means of inhibiting corrosion approved of by the Employer's Agent. Denso tape must be carefully moulded over the paste and fitting in order to expel all voids.

“PSL 3.9.7* Corrosion protection for valves and Hydrants

All gate valves and hydrants shall be fusion-bonded epoxy coated internally and externally to SABS 1217 or DIN 30677”.

PSL 3.10 VALVES

Notwithstanding the provisions of this Subclause, the following shall apply with respect to the various valves specified on the drawings and scheduled:

PSL 3.10.1* Gate Valves

Gate valves shall comply with the following:

Gate valves shall be AVK Series 43/60 or approved equivalent gate valves which conform to the requirements of SABS 664 and shall be of the resilient seal type. All valves shall have a working pressure rating of at least 16 Bar and shall be clockwise opening with non-rising spindle and cap top unless otherwise specified. The wedge shall be fully encapsulated with NBR rubber internally and externally. The wedge nut shall be of the “fixed nut” concept allowing no movement and manufactured from dezincification resistant high tensile navy brass. The primary seal for stern sealing shall be a NBR rubber hydraulic U seal (Manchette type) and the secondary seal shall consist of at least two NBR O rings inside and two outside of a Nylon Bush. The body of the valve shall further bear the SABS mark, trade name, as well as the size and class of valve.

PSL 3.11.1 Bricks

All bricks shall comply with SABS 227 and shall be NFX burnt clay masonry units free of stones, cracks and other defects. The bricks shall be obtained from an approved manufacturer and samples of the bricks shall be submitted to the Employer’s Agent for approval.

PSL 3.11.6 Surface boxes

Delete the contents of this sub-clause and replace by:

“For non-trafficked areas, surface boxes are to be the thermoplastic type.”

PSL5 CONSTRUCTION

PSL 5.1.1 Add the following:

“uPVC pipes shall be laid, cut and jointed strictly in accordance with the manufacturer’s instructions. A pipeline shall further be laid continuously; the leaving of gaps for fittings will not be permitted.”

PSL 5.1.4 Depths and cover

Replace the contents of subclause 5.1.4.1 with the following:

Unless otherwise shown on the drawings or instructed by the Employer’s Agent, cover to pipes shall be as follows:

During construction:

Where construction traffic is liable to cross over pipes, they shall be laid so that there is not less than 0,75m of cover over the pipe. Road crossings shall be constructed after the construction of the road layers has reached the stage where 0,75m cover is available.

Pipes beneath Verges and Open Spaces:

The tops of pipes beneath verges shall be not less than 0,75m and not more than 1,25m below the final verge level.

Supply Connection:

The tops of pipes shall not be less than 450mm and not more than 600mm below the final road surface.

Pipes beneath existing roadways:

The tops of pipes beneath a road shall not be less than 1m and not more than 1,25m below the road level.

“PSL 5.1.4.6* The top of the spindle of a gate valve shall not be less than 75mm nor more than 600mm below the level at which the top of the valve box is to be set. To ensure the aforementioned, valve spindle extension pieces shall be fitted by the Contractor.”

PSL 5.3 SETTING OF VALVES, SPECIALS AND FITTINGS

Add to Clause 5.3:

“The hydrant shall be bolted to the tee such that the outlet is in line with the pipeline. Valves shall be positioned opposite the erf splay peg at intersections.”

“PSL 5.11* KOUGA LOCAL MUNICIPALITY WATER MAINS

The Contractor shall not operate any valve on the Kouga Local Municipality (KLM) water mains. When a section of the existing network is required to be isolated, the Contractor shall request the KLM Water Division to close the necessary valves. Any work on an existing main shall also only be carried out with the knowledge of the KLM Water Division, and if required, under the supervision.”

“PSL 5.12* SUBSEQUENT MAINTENANCE

Should leaks develop during the maintenance period or any defects need attention, these will be rectified by the Municipality (KLM) at the Contractor’s expense, including the cost of retesting and subsequent sterilisation.”

PSL 5.13* MARKERS FOR VALVES AND FIRE HYDRANTS

An appropriate marker shall be placed by the Contractor at the position of each valve, fire hydrant and on pipes (bends and pipeline lengths exceeding on bulk pipelines at 80m intervals).

The markers shall be manufactured and installed in accordance with the details shown on the drawings.”

PSL 6 TOLERANCES

PSL 6.2 CONTROL POINTS

Add the following:

“Valves shall be located as indicated on the plan layout opposite the boundary peg of the erf, and to within a longitudinal tolerance of 100mm.”

PSL 6.3 ALIGNMENT (PLAN & LEVEL)

Add to the last sentence:

“, provided this does not result in a reversal of the grade of the pipeline.”

PSL 7 TESTING

PSL 7.1 GENERAL

Notwithstanding the provisions of this subclause, the Contractor shall take note that an official of the Municipality’s Water Division shall witness each successful leakage test carried out. Visits to the site of this official to witness a test will be charged at a rate determined by the Water Engineer per visit after the initial visit, which monies shall be payable by the Contractor.

PSL 7.3.1 Test pressure and time of test

Add to sub-clause 7.3.1.1:

“The Contractor’s test equipment shall be connected directly to the flange of a hydrant tee – not through the hydrant’s screwed outlet – or through a specially adapted end cap or a short, discardable pipe. Alterations may have to be made to the Contractor’s test equipment to allow the placing of a Water Division’s “in-line” check pressure gauge. If necessary, this will be requested by the Employer’s Agent prior to the start of a leakage test.

With reference to subclause 7.3.1.2 the maximum working pressure shall be the pressure rating of the pipe.

Replace the last line of Clause 7.3.1.3 “less than these points” with the following:

“less than 1,25 nor more than 1,5 times the specified maximum working pressure.”

Delete Subclauses 7.3.1.3 and 7.3.1.4

Add to sub-clause 7.3.1.5:

“Water used by the Contractor to fill the reticulation and during testing shall be water drawn from the Municipal mains and transported in a clean container. A metered connection may be installed by the Water Division upon the request of the Contractor and upon the payment of the prescribed fee. The bleeding off of air trapped within the reticulation shall only be carried out via the hydrants, erf connections or at the prescribed connection points to the existing reticulation by:

- (1) a bleeder system fitted to the end caps, or
- (2) a bleeder system fitted to a short length, say 500mm, of a pipe included at the end of the new reticulation.

PSL 7.3.3 Permissible Leakage Rates

“When testing reticulations made up of different types of pipes, the arithmetical sum of the respective calculated leakage rates for the various pipe types, diameters and lengths shall be taken as the maximum allowable leakage. Alternatively, the Contractor may request that each section be tested separately in which case the additional tests, witnessing and connecting fees shall be at his expense.”

“PSL 7.3.4* Witnessing of a Successful Leakage Test by an Official of the Water Division

The Contractor shall take note that the Employer’s Agent Representative is required to ensure that an Official of the Water Division (KLM) witnesses a successful leakage test of the whole new reticulation being put forward for acceptance. Visits to site of this official to witness the test after the initial visit will be charged at a rate determined by the Municipality.

This amount shall be payable directly to the Municipality by the Contractor prior to each subsequent visit.

“PSL 7.3.5* Removal of Test Equipment

Upon the successful completion of the leakage test the new reticulation will be deemed to be Municipal property and the Contractor shall not carry out any work on the pipes apart from the disconnection of his pump, the completion of the backfilling to the pipeline and construction of the hydrant and valve chambers and connecting in the new reticulation as soon as possible and the Contractor shall supply such materials, pipes and specials as detailed by the Employer’s Agent. The completion of backfill at the connection points and the surface restoration / reinstatement shall be carried out by the Contractor.”

“PSL 7.5* DEFECTS LIABILITY PERIOD

Should leaks or defects develop during the Defects Liability Period they shall be rectified by the Municipality at the Contractor’s expense. This will include the cost of re-testing and subsequent sterilization. During the Defects Liability Period the Municipality may carry out further pressure tests on the whole or part of the new reticulation and any necessary remedial work shall be carried out at the Contractor’s expense.”

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.1 GENERAL

Replace the second sentence of this subclause with the following:

“No payment will be made for depths of excavation in excess of those specified unless ordered in writing by the Employer’s Agent.”

Amend the heading of subclause 8.2.1 as follows:

“PSL 8.2.1 Collect, lay, joint, bed and test pipes complete with couplings and including disinfections
.....Unit: m”

Add the following:

“Couplings shall be held to include compression couplings required to join lengths of HDPE pipeline.

The rate tendered shall further cover the cost of the work provided for under 8.2.4, and with respect to testing, the supply and installation of all equipment, fittings and specials required, as well as the cost of water drawn (Refer PS 6.1). The measured quantity of pipe length will not, except for the payment of materials on site, be measured for payment until the length under consideration has been accepted in terms of subclause 7.3, PSL 7.3.1 and PSL 7.3.3. Refer also PS 8.3.”

Amend the heading of subclause 8.2.2 as follows:

“PSL 8.2.2 Extra over 8.2.1 for the supplying, laying, jointing, bedding and testing of specials complete with Couplings
..... Unit: No

Add the following:

“The rate tendered shall also as applicable cover the cost of the provision of corrosion protection as specified in PSL 3.9.1, PSL 3.9.6 and PSL 3.9.7.”

PSL 8.2.3 Extra over 8.2.1 for the supplying, fixing and bedding of valves Unit: No

Add the following:

“The rate tendered shall also as applicable cover the cost of the provision of corrosion protection as specified in PSL 3.9.1, PSL 3.9.6 and PSL 3.9.7”.

Replace the heading and contents of subclause 8.2.13 with the following:

“PSL 8.2.13 Chambers

a) Valve Chambers, etc. Unit: No

Valve chambers, etc., will be measured as complete units for which separate items will be scheduled for each type of chamber of overall depth not exceeding 1,5m from soffit of roof to floor level complete as detailed on the Drawings.

The tendered rate shall cover all materials, plant and labour necessary for the complete construction of the chambers, including ladders, doors, manhole covers and frames, handrails, the lifting davit as well as the compaction of the bottom of the chamber excavation to 90% of modified AASHTO maximum density as well as for building in of the pipes through the wall, for frames and concrete pedestals, as and when required.

b) Extra over for chambers of depth exceeding 1,5m Unit: No

Additional depths of chambers in excess of 1,5m will be measured in increments of 0,5m depth for each type of chamber.

The rate tendered shall cover the cost of the complete construction of each extra 0,5m additional depth as well as for additional step irons, brickwork and uPVC pipe as required.”

“PSL 8.2.16* Supply and install valve and hydrant markers.....Unit: No

The rate tendered shall cover the cost of the supply of the markers complying with the details shown on the drawings, as well as the cost of all labour and equipment required to install the markers as specified in PSL 5.13, or as directed.”

“PSL 8.2.17* Connection to Existing Mains.....Unit: No

An item will be allowed in the Schedule of Quantities for the connection to existing mains by the Contractor after acceptance of the reticulation.

The rate tendered shall cover the cost of isolating the main, cutting into the main, connect fitting, dewatering the excavation, taking steps to prevent the ingress of ground, stones and other material into the main, as well as for making good any damage to the existing main.

The excavation to expose the main, the supply, laying, bedding, coupling up and testing of valves and specials used in the connection, as well as the provision of bedding, will be measured for payment under the appropriate items provided for this in the schedule.”

PSLB BEDDING (PIPES)

PSLB 2.3 DEFINITIONS

Flexible pipe

Add the following:

“uPVC pipes shall be classified as flexible pipes.”

PSLB 3 MATERIALS

PSLB 3.1 SELECTED GRANULAR MATERIAL

Replace the contents of Clause 3.1 with the following:

“Selected granular material shall be an aggregate, sand or granular material, all being a non-cohesive material that is free of vegetation, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0.075mm sieve and has a compactability factor not exceeding 0,4.”

PSLB 3.3 BEDDING

Add the following:

“For the purposes of this clause uPVC pipes shall be classified as flexible pipes.”

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).”

“PSLB 3.5* BEDDING IN WATERLOGGED CONDITIONS

Where ordered by the Employer’s Agent a bedding cradle of the specified thickness, comprising of 6,7mm concrete stone complying with SABS 1083, shall be used in waterlogged conditions.”

PSLB 5 CONSTRUCTION

PSLB 5.1.1.2 Bottom

Add the following:

“Where expansive clay is encountered in the trench bottom, the selected fill blanket shall comprise of selected granular material.”

PSLB 5.2 PLACING AND COMPACTING OF RIGID PIPES

Stormwater pipes shall be bedded as specified for rigid pipes unless otherwise indicated on the drawings or ordered by the Employer’s Agent.

PSLB 5.3 PLACING AND COMPACTING OF FLEXIBLE PIPES

Notwithstanding the provisions of this subclause, the bedding for flexible pipes shall be constructed to the dimensions shown on the Drawings and by using the bedding material specified (refer also PSLB 5.1.2).

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1.3 Volume of bedding materials

Notwithstanding the provisions of this subclause, the volume of bedding will be computed from the dimensions shown on the Drawings.

Replace the last sentence with the following:

“No allowance will be made for bulking of material or any additional volume of bedding material required due to over break or any other cause.

Further, the volume of bedding displaced by the pipeline will not be measured for payment.”

PSLB 8.1.5 Disposal of displaced material

Replace the contents of this Clause with the following:

“Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage shall be payable for such material.”

PSLB 8.2.2.3 From commercial sources

(c)* 6,7 mm concrete stone to SABS 1083Unit: m³

Add the following to the end of this Clause:

“Commercial sources shall include off-site sources located by the Contractor.”

PSLB 8.2.4 Encasing of pipes in concreteUnit: m³

The item volume for concrete encasement to the pipes will be computed from the dimensions of the concrete as given on the drawings.

The concrete shall be 20 MPa concrete with 19mm stone. The rate shall cover the cost of dealing with any excavation (in all material including disposal of surplus) that is additional to that measured under the item for pipe trench excavation, the cost of encasing the pipe in concrete including the cost of formwork (if any), etc., and the cost of formwork to form flexible joints at each pipe collar or joint.

“PSLB 8.2.6* Supply and install geofabric material (Kaytech A2 or similar approved) Unit: m²

The unit of measurement shall be the square metre, measured in accordance with Subclause 8.2.4 of SABS 1200 DK.

PSLK VALVE INSTALLATIONS. (SPEC LK)

PSLK 3 MATERIALS

PSLK 3.1 GENERAL

The applicable detail sheets found in Part C3.2 of this tender document are to be filled in for all the relevant valves.

PSLK 3.2 AIR VALVES

Air valves shall be as detailed on the drawings or similar approved. Each air valve shall be fitted with a flanged resilient seal gate valve with handwheel. All air valves shall have a PN 16 pressure rating and shall be flanged and drilled in accordance with the relevant tables of SANS 1123.

PSLK 3.3 GATE VALVES

PSLK 3.3.1 General

The resilient seal gate valves supplied under this Contract shall be constructed in accordance with SABS 664 for CI waterworks gate valves, be double flanged, anticlockwise closing, with non-rising spindle type fitted with hand wheels. The direction of closing must be shown clearly on the valve. The valve shall be drop-tight when tested in accordance with BS 5163.

The design of the stuffing box shall be such that the rubber or neoprene "O" rings can be replaced while the valve is in service without having to remove the valve dome. Gate valves shall be “AVK” or similar approved.

The valves shall be capable of being operated manually under maximum unbalanced operating conditions.

PSLK 3.3.2 Operating condition – Resilient seal gate valves

The resilient seal gate valves will be used as isolating valves on the air valve installations.

PSLK 3.4 Protection against corrosion. (Subclause 3.14)

The isolating and non-return valves shall be internally and externally epoxy painted in accordance with SPEC HP and PSHP.

PSLK 8 MEASUREMENT AND PAYMENT

PSLK 8.1 VALVES - SUPPLY AND INSTALL

PSLK 8.1.1 General

Measurement and payment for equipment to be supplied and delivered to Site shall be in accordance with Subclauses 8.1(c) and 8.2.1. The tendered rates shall include for all items specified in Subclause 8.2.2.

PSLK 8.1.2 Installation, site testing and commissioning

The installation of the valves will be measured by number.

The tendered rates shall cover the costs of handling, installing, site testing and commissioning of the valve together with the cost of any cutting, turning, and jointing of pipes required to locate the valves, as well as for the construction of the valve pedestal block, other supports, plant and labour.

No separate payment will be made for the repairs to paintwork in the event of damage to the valves.

The tendered rates shall cover the cost of supply and delivery to Site of all the necessary bolts, nuts and jointing material and the storing of the valves in an approved manner.

PSME SUBBASE

PSME 1 SCOPE

Add the following:

"All the requirements as specified for the construction of subbase shall, except where otherwise stated or ordered, apply to the stabilization of the in- situ material as new subbase."

PSME 3 MATERIALS

PSME 3.2 PHYSICAL PROPERTIES

PSME 3.2.1 Subbase material

Replace the contents of paragraph (a) with the following:

"(a) The maximum particle dimension of the gravel shall not exceed 63 mm."

Replace the contents of paragraph (d) and (e) with the following:

"(d) The CBR at specified density shall be 45 for unstabilised as well as for stabilised material prior to stabilisation or as directed by the Engineer.

The UCS at 7 days of each cement-stabilized material shall at 100% modified AASHTO maximum density be as follows:

- For C3 cemented natural gravel : 1,50 MPa minimum and 3,00 MPa maximum
- For C4 cemented natural gravel : 0,75 MPa minimum and 1,50 MPa maximum"

(e) The ITS (Indirect Tensile Strength) for cement-stabilised material shall at 100% modified AASHTO maximum density be as follows:

- For C3 cemented natural gravel : 250 kPa minimum
- For C4 cemented natural gravel : 200 kPa minimum"

PSME 3.3.1 General

Add the following to this subclause:

"Where reference is made in this specification or the Standard Specifications to the cement specifications, e.g. SABS 471: Portland cement and rapid hardening Portland cement, it shall be replaced with the new specification:

SABS ENV 197-1: Cement-composition, specifications and conformity criteria.
Part 1: Common cements.

Furthermore, where reference is made in this specification or the Standard Specifications to different cement types, the following new names shall be used as a guide but must be confirmed by the Engineer.

Cement Grade	Cement Type	Approximate product name	old	New Alpha	New Blue Circle	New NPC	New PPC	New Slagment
52.5	CEM I	Rapid hardening		Rapid Hard	Duracast	Eagle Super		-
42.5R	CEM I	Rapid hardening		-	-	-		-
42.5	CEM I	OPC*		Portland Cement	Duratech	-	OPC	-
	CEM I	LASRC		-	-	-	LASRC	-
	CEM II A-S	PC15SL		-	-	Eagle Plus	-	-
	CEM II B-S	RH30SL		-	-	Eagle Plus	-	-
32.5R	-	-		-	-	-	-	
32.5	CEM II A-V	PC15FA		All - purpose cement	-	-	Surebuild	-
	CEM II A-W	PC15FA		-	-	-	Surebuild	-
	CEM II A-L	-		All purpose cement	-	-	Surebuild	-
	CEM II B-V OR W	PC25FA/PFAC*		-	Structcrete	-	Surecrete	-
	CEM II B-V OR W	PC25FA/PFAC*		-	Duracrete	-	Surecrete	-
	CEM III A	PBFC		-	BFC	Eagle Pro	-	PBFG
	CEM III A	RHSL		-	-	-	-	RHSL
22.5	MC 22.5X	PFAC***		Multi-purpose cement	Durabuild	-	-	-
	MC 22.5X	PFAC***		-	Buildcrete	-	-	-
12.5	MC 12.5	Walcrete		Mortar cement	Walcrete	-	Masonry	-
	MC 12.5	Mortacem		-	-	-	-	-

PSME 5 CONSTRUCTION

PSME 5.1 PRECAUTIONS

Add the following to this subclause:

"No stabilization shall be carried out during falling temperatures when the ambient air temperature falls below 7°C or during rising temperatures when the ambient air temperature is below 3°C.

The surface temperature of a compacted stabilized layer shall not be allowed to fall below 1°C during the first three (3) days after stabilization. The Contractor shall be responsible for taking the necessary measures in this connection, and especially to refrain from stabilizing when such temperatures become probable.

When a sudden unforeseen temperature drop to a level below this limit occurs, the stabilized layer shall be covered with the material required for the next layer to be constructed.

All stabilized layers damaged by frost or by the formation of ice in the layer shall be removed and replaced by the Contractor at his own expense.

The Contractor shall make allowance for these requirements in his construction programme, and no claims in this connection will be considered.”

The Contractor shall at all times supply all workers exposed to chemical stabilizing agents with approved protective apparel, eyewear and masks, and no person without such apparel, eyewear and masks shall be permitted to work with or be exposed to the chemical agents. Precautionary measure shall also be taken to ensure that any livestock and the public will not be exposed to the chemical agents blown by the wind or under similar circumstances”

PSME 5.2 EXCAVATION

PSME 5.2.2 Borrow pits

Insert the words "designated by the Engineer and" between the words "pits" and "established" in the first line.

PSME 5.4.1 Placing

The compacted thickness of the subbase for the various areas shall be that shown on the drawings.

PSME 5.4.4 Compaction

Notwithstanding the requirements of Clause 5.4.4.2 the subbase shall be compacted to 96% of modified AASHTO maximum density, as the case may be.

PSME 6 TOLERANCES

PSME 6.1 DIMENSIONS, LEVELS, ETC.

PSME 6.1.1 General

Add the following to subclause 6.1.1:

“For layers, constructed of subbase quality material, on which the bituminous surface will be placed, the tolerance for dimensions and level shall be as set out in SABS 1200 MF Subclauses 6.1.2 to 6.1.6 inclusive.”

PSME 6.3 STABILIZATION

Add the following:

“The coefficient of variation shall not exceed 0,3 (30%) for mixing in place and 0,2 (20%) for plant mixed material, calculated as follows :

$$\frac{S_n}{X_n} \quad \times \quad 100$$

Where:

Xn is the average and

Sn is the standard deviation of stabilizing content per lot”

"PSME 6.4* DIMENSION AND LEVEL CONTROL

The requirements of PSM 6.4 shall apply."

PSME 7 TESTING

PSME 7.3.3 Strength tests for stabilized material

Amend the contents of this clause to read as follows:

"The Contractor shall carry out tests on the stabilized material at the frequency specified in 7.2.1 and 7.2.2 and check that the material complies with PSME 3.2.1 (d) and (e).

PSME 8 MEASUREMENT AND PAYMENT

PSME 8.1 BASIC PRINCIPLES

Insert a semicolon in the first line of paragraph (b) after the words "will be paid for once only" and delete the rest of the paragraph.

Add the following to clause (d):

"A commercial source shall be held to include any off-site sources or borrow pits located by the Contractor. Further that no additional payment will be made for the temporary stockpiling of material from commercial sources, class of excavation, method of processing (except stabilizing), or for overhaul."

Add the following new clause after (d):

"(e)* The requirements of PSM 8.2 shall apply. The Contractor shall further make provision in the rates tendered for the construction of the subbase, for the cost of his own process control testing and the cost of complying with PSME 6.4."

PSME 8.3 SCHEDULED ITEMS

Replace the heading and contents of Clause 8.3.2 with the following:

"8.3.2 Construct subbase using material from stockpile Unit: m³

The rate tendered shall cover the cost of basic selection, loading from stockpiles, transporting, spreading, watering, compacting, final grading, complying with the tolerances, and testing.

No additional payment will be made for difficult work or hand operations in confined areas."

Replace the heading clause 8.3.3 with the following:

"PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources"..... Unit: m³

Add the following paragraph:

"No additional payment will be made for difficult work or hand operations in confined areas."

PSME 8.3.9 Overhaul (haul exceeding 2 km):

Replace the contents with the following:

"No haul will be paid."

PA TO PV: BUILDING WORKS

PARTICULAR SPECIFICATION – BUILDING WORKS

PA SECURITY AND FENCING

PA.1 GENERAL

The specification for Fencing shall be that as published by the South African Bureau of Standards, CKS 451-1976 entitled Specification for Anti-Intruder Fences, with the following specific requirements:

PA.2 SECTION 3.1.1

The material of the posts, extension arms (cast integrally with the posts) and stays shall be pre-stressed concrete).

PA.3 SECTION 3.1.5

The material of the wire (other than barbed wire) shall be galvanised and plastic coated mild steel wire.

PA.4 SECTION 3.1.6(A)

The mesh shall be of 2,4 m width.

PA.5 SECTION 3.1.7

The barbed wire shall be double-stranded mild steel wire of diameter 2,5 mm with first class galvanised coating.

PA.6 SECTION 3.2.2

The extension arm shall be a single straight arm cast at an angle to the post of +/- 135°

PA.7 SECTION 4.1.1

The fence shall be erected in the position indicated on the drawing or as directed on site.

PA.8 SECTION 4.1.3

There shall be at least 5 straining wires.

PA.9 SECTION 4.2.6

The bottom of the mesh shall be attached to the ground by the following method:

A continuous trench of depth and width approximately 100mm shall be provided between the posts. The bottom of the mesh shall be positioned at a depth of at least 50mm in the trench. Anchor pegs shall be attached to the bottom row of apertures of the mesh at spacing not exceeding 1,0 m and their free ends driven into the base of the trench to a depth of at least 40 mm. The trench shall be filled with earth or other suitable material, well rammed.

PA.10 MEASUREMENT AND PAYMENT

Measurement shall be by the linear metre of the fence and the price tendered and paid shall cover the full cost of supplying and erecting the fence completed, as specified.

PA.11 IDENTIFYING PAINTWORK

A horizontal bar of paint approximately 200 mm wide shall be painted centrally on all security fencing and gates with an approved quality paint in accordance with specification PU2.8

PB STOCKPROOF FENCING

PB.1 SCOPE

This specification covers the requirements for stock proof fencing and gates.

PB.2 SUPPORTING SPECIFICATIONS

The specification shall be read in conjunction with the following specifications published by the South African Bureau of Standards.

CKS 451 - 1976 : "Specification for Anti-intruder Fences"

PB.3 MATERIALS

PB.3.1 Straining posts, gate posts and stays

Straining posts, gateposts and stays shall be of timber and comply with the relevant requirements of SABS 457. The straining posts and gateposts shall have a minimum diameter of 125 mm and shall be 2,15 m long. The stays shall have a minimum diameter of 100 mm and shall be 2,15 m long.

PB.3.2 Intermediate posts (standards)

Intermediate posts (standards) shall be steel Y-section posts and capable of withstanding a bending moment of 700 Nm imposed over their length. These standards shall be 1,86 m long and have a mass per unit length of 2,5 kg/m.

PB.3.3 Intermediate posts (standards)

Intermediate posts (standards) shall be steel Y-section posts and capable of withstanding a bending moment of 700 Nm imposed over their length. These standards shall be 1,86 m long and have a mass per unit length of 2,5 kg/m.

PB.3.4 Droppers

Droppers shall be of steel T-sections and have a ridged crosspiece. Droppers shall be 1,4 m long and have a mass per unit length of 550 g/m.

PB.3.5 Wire

All wire shall comply with the relevant requirements of SABS 675 and shall be light class galvanised.

Barbed wire shall be double stranded mild steel of 2,5mm diameter.

Plain wire shall be 2,24 mm diameter high tensile.

Tie wire shall have a diameter of 1,6 mm.

PB.3.6 Bolts, nuts and washers

Strain eyebolts, hinge bolts, bolts and nuts shall comply with the relevant requirements of SABS 135. Washers shall comply with the requirements of SABS 1149.

The nominal diameter of the bolts shall be M10 in the case of strain eye bolts, M12 in the case of bolts for bolting stays to straining posts, and M16 in the case of hinge bolts for gates.

PB.3.7 Pedestrian and vehicular gates

Pedestrian and Vehicular gates shall be Type A (general purpose single gate) with tubular frame and strained wire filling. Pedestrian gates to be 1,2 m high and 800 mm wide. Vehicular gates to be 1,2 m high and 3,6 m wide.

The main frame and bracing shall be manufactured of ductile weldable mild steel tubing with nominal internal diameters of 25mm and 20mm, respectively.

The gate frame and fittings shall have a hot-dip galvanised finish and the corners of the main frame shall be round.

Strained wire filling shall be of galvanised steel wire complying with the requirements of SABS 675 for mild steel wire with Class C (light) galvanised, spaced to suit the fence.

PB.3.8 Concrete

All concrete used in foundations shall have a minimum compressive strength of 10 MPa and shall comply with SABS 1200 GA.

PB.4 ERECTION

PB.4.1 General

The fence shall have a nominal height of 1,20m. Both the bottom and the top strands of wire shall be barbed wire with alternating strands of plain and barbed wire between (6 strands barbed wire and 5 strands plain wire).

The bottom strand of wire shall be fixed nominally 100mm above ground level, the next 5 strands shall be fixed 100mm apart with the remaining top strands being 120mm apart.

PB.4.2 Foundations

Each straining post, gate post, intermediate post and stay shall be embedded to full depth in a foundation hole of the following minimum dimensions:

- (a) Straining Post and Gate Post : 450 x 450 x 800 mm deep.
- (b) Intermediate Posts : 300 x 300 x 500 mm deep.
- (c) Stays : The hole shall have a length of 500 mm along the line of the fence and a width of 300 mm. The stay when in position, is to be approximately 45° to the post.

All foundation holes shall be at least half filled with concrete, except in the case of gate posts where the concrete shall be brought up to the height of approximately 50 mm above ground level.

The holes half filled with concrete shall be backfilled with soil, which shall be well rammed and consolidated.

PB.4.3 Posts

Straining posts shall be provided at all corners and other changes of direction, at acute variations in the level of the fence and along straights at minimum 500 m centres. Intermediate posts shall be spaced at 16 m centres.

Droppers shall be spaced at 4 m centres and shall be attached to the fence by tie wires using three full turns.

Gates shall not be hung on straining posts; instead, two additional posts shall be provided as gate posts at each gate.

PB.4.4 Stays

In general, two stays shall be bolted to each straining post. Straining posts at pedestrian access points and gateposts shall have only one stay. All stays shall be at 45° to the main posts, behind the wire and on the line of the fence.

PB.4.5 Barbed and plain wire

Each strand of wire shall have one end taken at least twice around a straining post, or passed at least twice through the eyebolt, with the free end twisted at least three times around the strand itself.

The wire shall be secured to each intermediate post by a tie wire, and the tie wire shall be secured to the barbed or plain wire by at least three complete turns on both sides of the post.

PB.4.6 Bolts, nuts and washers

One washer shall be placed under all nuts, and the end of bolts shall be burred over after erection has been completed.

PB.4.7 Vehicular gates

Vehicular gates shall be erected such that:

- (a) There is a gap of not less than 25 mm and not more than 50 mm between the hinge stiles and the gatepost.
- (b) There is a clearance of not less than 75 mm and not more than 150 mm between the bottom horizontal frame members and the ground.
- (c) When closed, there is a space of not more than 75 mm between the closing stile and the gatepost.

PB.5 MEASUREMENT AND PAYMENT

PB.5.1 Fence

Measurement shall be per linear metre of fence, with deductions made for all openings or gaps, and the price tendered and paid shall cover the full cost of supplying and erecting the fence complete, as specified.

Gates will be measured separately by number.

PC CONCRETE BLOCK PAVING (INTERNAL ROADS, PARKING AND PATHS)

PC.1 MATERIALS

PC.1.1 Bed Sand

Sand shall be a sharp washed sand containing not more than 3% of silt by weight and with not more than 15% retained on a 2,36 mm sieve.

PC.1.2 Jointing Sand

Jointing sand shall pass a 1,18 mm sieve and contain 90% material passing the 75 µm sieve. The sand shall be free of all soluble salts or contaminants likely to cause efflorescence or staining.

PC.2 CONSTRUCTION

PC.2.1 Sand Bed (Laying Course)

The laying course of sharp sand as specified shall be screeded to level between screed rails set to precise levels on the basecourse. Care is to be taken to avoid uneven compaction of the screeded sand and workmen should not be permitted to walk over the screeded area either during or after the screeding operation.

The road is to be screeded to a surcharge level to allow for compaction. In order to establish the correct level, an allowance of 1,4 x compacted thickness is generally adopted by to ensure that the surcharge is correct the final road level must be checked after the first few metres of blocks have been laid and vibrated into place. If the level is incorrect the blocks must be lifted and the sand raked and re-screened to the correct level.

To help maintain uniformity the sand should be obtained from a single source and allowed to drain before use and covered over to minimise moisture changes.

PC.2.2 Surface Course

The blocks are to be laid in a herringbone pattern unless they are of an interlocking type.

The positioning of the first blocks demand extra care and they should be placed at the correct angle against a firm starting edge such as a kerb or channel.

The order of laying must ensure that the blocks can be placed easily and in such a way that it is not necessary to force a block between those already laid.

Each block must be placed firmly against its neighbours, being held slightly above the laying course so as not to disturb the sand until the block is in its correct position. Any damaged or disturbed blocks should be rejected.

All blocks must be laid so that they fit closely together. If joints begin to open they should be knocked together with a wooded mallet. Care must be taken not to tilt the blocks on the leading edge by standing on them.

Blocks up to and including 80 mm thickness are to be vibrated to their final level with a plate vibrator having an area of 0,2 to 0,4 m² and a centrifugal force of approximately 7 to 16 kN at a frequency of 75 – 100 Hz. For greater thickness the plate vibrator shall have an area of 0,35 to 0,5 m² and a centrifugal force of approximately 16 20 kN at a frequency of 75 – 100 Hz.

The vibrator should be passed at least 3 times over the whole area and should not be brought closer than 2m to the working face where blocks are unrestrained.

After this initial vibration, dry jointing sand as specified shall be brushed over the surface of the blocks and vibrated into the joints by a further 2 or 3 passes of the plate vibrator. After all the joints are filled surplus sand is to be swept away.

The finished surface of the paved area shall be uniform, true to cross-section and level and shall have not broken blocks or joint openings greater than 5 mm in width. When tested with a 3 mm straight edge the surface shall not vary from the underside by more than 10 mm. Levels of adjacent blocks shall not differ by more than 3 mm and the line of the pattern shall not deviate more than 15 mm from a 3 m straight edge.

PC.2.3 Edge Restraints

Adequate edge restraint in the form of kerbs, channels or concrete edgings suitably bedded and haunched in concrete must be provided around the paved areas.

PC.2.4 Infill at Edges

Areas against kerbs, manholes, etc, requiring infilling and which exceed 25% of the full block unit shall be filled with units cut to size using an approved cutting machine. Infill areas constituting less than 25% of a full block area and of 25 mm minimum dimension shall be filled with 25 MPa concrete. Smaller areas shall be filled with a 4:1 sand cement mortar.

PC.2.5 Laying Blocks Around Curves

The herringbone pattern should not be disturbed in an attempt to follow curves.

PC.3 MEASUREMENT AND PAYMENT

Measurement and payment shall be per m² of block paving laid. Payment shall include for the supply of blocks, bedding and jointing sand and all labour, tools and plant involved in spreading the sand, placing the blocks, compaction and filling joints, and for the cutting of blocks where necessary.

PD EARTHWORKS

PD.1 EARTHWORKS

Before commencing any earthworks the Contractor shall satisfy himself as to the accuracy of any levels indicated on the drawings as no claim will be entertained at a later date for any alleged inaccuracy in such levels.

Excavation to trenches, bases, etc., is measured the net width of concrete or other foundations and no allowance is made for battering sides. In measuring excavations this rule will be adopted irrespective of the size and extent to which excavations may have been executed.

Any excavations for trenches and holes taken out too deep shall be made up to the correct level with concrete (Class 20A) as later specified at the Contractor's expense, backfilling and ramming will not be accepted.

Rates are to include for trimming sides and stepping, levelling and ramming bottoms.

Unless otherwise described, the surplus material from the excavations, except when required for filling, is to be wheeled, deposited and spread on site as directed, within 100 metres of the perimeter of the building.

PD.1.1 Pickable material

Pickable Material is understood to include sand, earth, clay, gravel, soft shale, loose boulders less than 75 mm diameter, made up ground, etc., which is removable with pick and shovel.

PD.1.2 Soft rock

Soft Rock is understood to include outcrop, hard shale, mountain overburden, decomposed and weathered rock or rock of similar hardness and loose boulders from 75 mm diameter up to 0.03 m³.

PD.2 HARD ROCK

Hard Rock is understood to include granite, quartzite, sandstone, mountain stone or rock of similar hardness.

PD.3 BLASTING

In the event of the Contractor deciding to resort to blasting for the loosening of the ground to be worked, he must conform to the relevant Government Regulations governing blasting and must indemnify the Employer against any possible claims which might arise.

PD.4 MEASUREMENT OF EARTHWORKS

The method which has been adopted in this Bill of Quantities for the measurement of earthworks is that the site has been first excavated to the new formation levels. The foundation excavations have then been measured below such formation levels. This method will be adhered to in all measurements of excavations, and should the Contractor wish to perform them in any other order or by any other method, he must allow for so doing in his rates.

PD.5 CARTING AWAY SURPLUS MATERIAL

The item measured for carting away of surplus excavated material is to include for loading onto transport and removing completely from the site. The volume measured is net as excavated, and the Contractor is to allow for bulking in his rate.

When an item is measured for carting away surplus excavated material and the Engineer's permission has been obtained to use such surplus material in the mixing of plaster, mortar, etc., the measured volume of material to be carted away will be adjusted accordingly.

PD.6 KEEP EXCAVATIONS FREE OF WATER

Allow for keeping excavations free from water and mud accumulating by seepage, rain, storms, floods, or any other water by pumping or baling or as maybe necessary.

PD.7 RISK OF COLLAPSE OF EXCAVATIONS

The items measured hereafter to the superficial area of the sides of the excavations (all sides measured) are to be priced by the Contractor to include for maintaining the sides of these excavations by such methods as he may choose to adopt, either by cutting back the soil to its natural angle of repose, or by open or close planking and strutting, or for any risk incurred by his failure to adopt any of the preceding methods.

Should any ground fall in other than that required to be excavated, owing to omission or inefficiency of planking and strutting, it will not be paid for as excavation and must be dug out and deposited on site or carried away, returned and refilled as directed by the Engineer.

Where excavations exceed 1,5 m deep the Contractor shall maintain all excavated faces in accordance with Government Regulations, as separately provided for.

PD.8 EARTH FILLING

Filling under solid floors and over site is to be executed with approved dry earth, free from clay and spread in layers not exceeding 200 mm thick, well watered, rammed and consolidated to optimum density. Prices for filling over site are to include for forming to falls, slopes, banks, etc.

When in the opinion of the Engineer, the density of the natural ground under surface beds is insufficient for the duty required, the surface shall be scarified to a depth of 150 mm with a mechanical ripper or other approved equipment watered as necessary and re-compacted as specified.

In fills, if the final layer required to bring the level of the surface up to that specified is less than 75 mm thick the preceding layer shall be scarified to a depth of 100 mm, the final layer spread on the scarified surface and the whole compacted as described.

PD.9 GARDEN SOIL FILLING

Garden soil filling shall be rich, selected, well-sifted soil containing proper proportions of loam and leaf mould, and shall be lightly compacted.

PD.10 HARDCORE

Hardcore filling to be composed of hard broken bricks, stone or other approved hard material (not less than 25 mm and not exceeding 75 mm in section), evenly spread and levelled with the finer material on top, well consolidated by ramming and levelled off under solid floors, steps, landings, etc.

PD.11 PROTECTION AGAINST TERMITES

Ant-proofing under solid or suspended floors is to be executed by an approved and registered specialist firm of pest exterminators, who will be required to provide a written guarantee to the Engineer, that no subterranean termites will appear within the treated area, for a minimum period of 10 years. Particular care is to be taken in treating the soil on both sides of foundations, walls, piers, etc., and to ensure that the ground surface treated is not ruptured. Should the poisoned layer be ruptured at any point, it shall be made good and the affected area treated again.

PE FORMWORK

PE.1 STANDARD SPECIFICATION

All work involving formwork in the construction of concrete shall conform with the requirements of SABS 1200 G except where otherwise specified.

PE.2 DESIGN OF FORMWORK

The Contractor shall be wholly responsible for the design, sufficiency and strength of the formwork. If required, the Contractor shall submit design calculations and formwork proposals to the Engineer for approval before construction.

All formwork shall be constructed of timber, sheet metal or other approved material. The soffits of beams shall be erected to an approved upward camber, which shall not be less than 1 in 1000 except where windows are fixed directly to beam soffits in which case the soffits shall be level unless otherwise specified. The maximum deflection of any formwork component supporting wet concrete shall not exceed 1/360 of the span of that component. Gumpoles used as props shall not be less than 100 mm at any diameter.

No timber shall be used which shrinks or warps or swells to such an extent that the corners of concrete members will be damaged before the concrete has set hard.

On formwork to faces which will be permanently exposed, all horizontal and vertical formwork joints shall be so arranged that joint lines will form an approved uniform pattern on the face of the concrete. Where the Contractor proposes to make up the formwork from standard sized manufactured formwork panels, the size of such panels shall be approved by the Engineer before they are used in the construction of the Works. The finished appearance of the entire elevation of the structure and adjoining structures shall be considered when planning the pattern of joint lines caused by formwork and construction joints to ensure continuity and vertical lines.

Faces of formwork in contact with concrete shall be free from adhering foreign matter, projecting nails and the like, splits or other defects, and all formwork shall be clean and free from standing water, dirt, shavings, chippings or other foreign matter. Joints shall be sufficiently watertight to prevent the escape of mortar or the formation of fins or other blemishes on the face of the concrete.

Formwork shall be provided for the top surfaces of sloping work where the slope exceeds fifteen degrees from the horizontal (except where such top surface is specified as spaded finish) and shall be anchored to enable the concrete to be properly compacted and to prevent flotation. Care shall be taken to prevent air pockets being trapped against the upper shutter.

Openings for inspection of the inside of the formwork and for the removal of water used for washing down shall be provided and so formed as to be easily closed. Before placing concrete all bolts, pipes or conduits or any other fixtures which are to be built in shall be fixed in their correct positions, and cores and other devices for forming holes shall be held fast by fixing to the formwork or otherwise.

All exterior angles on the finished concrete of 90 degrees or less shall be given 20 mm by 20 mm chamfers unless otherwise shown on the drawings or as ordered by the Engineer.

No nails shall be driven nor ties or bolts or other devices shall be built into the concrete for the purpose of supporting formwork without the prior approval of the Engineer. The whole or part of any such supports shall be capable of removal so that no metal part remaining embedded in the concrete shall be nearer than 50 mm from the surface in

the case of reinforced concrete and 150 mm in the case of unreinforced concrete. Small tubes of fibre cement maybe used up to the shutter. Holes left after removal of such supports shall be neatly filled with well rammed dry-packed mortar.

PE.3 CLASSES OF FORMWORK

Formwork may be of steel or timber and will be specified for use in accordance with the following classifications:

Class 1 - Rough formwork intended for use in forming concrete faces which will be covered by earth or brickwork, e.g. foundations, external faces of retaining walls and the like.

While the concrete faces resulting from the use of this class of formwork may be rough, the joints shall nevertheless be sufficiently tight to prevent leakage of mortar from the concrete.

Class 2 - Formwork intended for use in forming concrete faces which will be plastered or covered with tiles, mosaic or other similar finishes shall be such as to impart to the resultant concrete face a finish equal to that which would be obtained by use of sawn timber or ordinary steel plates.

Class 3 - Formwork intended for use in forming concrete faces which will not be covered other than by painting, if at all, shall be such as to impart to the resultant concrete face a finish equal to that which would result from the use of plywood faced shutter boards or special steel forms which are new when concreting commences and are thoroughly cleaned after each use. The concrete surfaces shall be free from porosities, blowholes and surface aggregate. If not attained after stripping of formwork, the Contractor shall achieve the specified finish and tolerance by the proper use at the correct time of carborundum blocks or other approved means.

When this class of formwork is used to form the soffits of slabs or the faces of walls or columns, no wire ties passing through the face of concrete shall be used and the arrangement of panels shall be symmetrically set out from edges or centre lines. Odd dimension fill-in panels shall be cut to size and symmetrically placed in approved positions. All joints between shutter panels shall be straight and tight to approval.

Class 4 - Special formwork for forming kerbs, pedestals and the like. This formwork shall be in the form of special moulds and shall be made of a non-staining material with a smooth unblemished surface such as sanded plywood, hard compressed fibre board or purpose made steel forms.

The finish shall be as for Class 3 formwork and trial casts shall be made with the forms and the Engineers approval obtained in writing before the forms may be used.

PE.4 TOLERANCES

Concrete surfaces resulting from the concrete have been cast against the formwork shall not depart from the intended lines or plane surfaces shown on the drawings by more than the following distances. Gradual departures from plane surfaces being defined as the out-of-true measurements of the concrete surfaces falling between the ends of a 3 metre long straight edge placed against such surfaces in all directions. Abrupt departures shall include lips between successive casts of concrete, fins and the like shall be brought to within tolerance by grinding or other acceptable means at the Contractor's expense.

In particular the departures from the levels of soffits of beams and slabs shown on the drawings shall not exceed the tolerances shown in the following table.

Formwork	Tolerance on positions of formwork	Gradual Departures	Abrupt Departures	Soffit Tolerances (Beams and slabs)
1		15 mm	10 mm	+ 15 or - 15
2	As per SABS	8 mm	5 mm	+ 10 or - 0
3	1200 G	5 mm	1,5 mm	+ 10 or - 0
4		3 mm	1,5 mm	-

A tolerance of 3 mm or 1/2 of 1%, whichever is the larger, shall be permitted on cross-section dimensions of structural members. For concrete stairs, the maximum variation permitted in successive dimensions between nosings shall be 3 mm vertically and 6 mm horizontally.

PE.5 SOFFIT GROOVE FORMERS

Where specified, forming strips of approved extruded plastic or similar material shall be inserted between adjacent formwork elements forming the soffit shutters to slabs or the face shutters to walls, in such a manner as to form grooves in the concrete soffits or faces along the formwork joints. The resultant groove shall have the shape of an inverted letter V and shall be 10 mm deep and 10 mm wide at the bottom. The grooves shall be straight and arranged in patterns to the Engineer's approval. Alternative shapes for the grooves will be considered.

PE.6 HORSING UP

Unless otherwise stated all horsing up under formwork is exceeding 1,5 metres and not exceeding 4,5 metres high.

PE.7 ADEQUATE SUPPORT FOR PROPS

Where props must be supported on filled material or on the natural ground, suitable precautions shall be taken to prevent settlement of the props. All vertical strutting and propping shall be founded on earlier construction which will afford the required support without settlement or damage. Particular care shall be taken with the propping of cantilevered beams and slabs in successive stories of construction. Props shall be placed vertically above one another and all props shall remain in position or be replaced immediately after striking the soffit formwork until all floors have been constructed.

In structures having in whole or part, two or more reinforced concrete floors, props to the approval of the Engineer, shall be provided under the soffits of beams and slabs or any floor which is being used to support the formwork and wet concrete of the floor above. These props shall not be removed until the formwork supporting the concrete of the floor above has been struck.

No formwork, however, is to be removed without the prior consent of the Engineer.

PE.8 RE-USE OF FORMS

Immediately after stripping, forms intended for re-use shall be thoroughly cleaned and re-conditioned and, in the case of steel forms, be oiled to prevent rusting. They shall be neatly stacked and protected from damage until required for re-use. Any formwork elements which have become damaged or distorted to such an extent that their re-use, will, in the opinion of the Engineer, result in the concrete or the surface of the concrete not complying with the requirements of this Specification, shall be removed from the Site.

PE.9 FORMWORK MOULD OIL

Formwork in contact with the concrete shall be treated with an approved non-standing mould oil to prevent adherence of the concrete, except where the surface is subsequently to be rendered. The Contractor shall ensure that the mould oil is completely compatible with the concrete surface treatment to be used, paint work and the like. Every precaution shall be taken to prevent the oil from coming in contact with the reinforcement or with concrete at construction joints. Surface retarding agents shall be used only when ordered by the Engineer.

PE.10 HOLES FOR ELECTRICAL WORK

Should steel formwork to be used by the Contractor must either allow the Electrical Specialist to drill holes through the formwork for fixing of junction boxes, or make other arrangements so that the junction boxes can be properly fixed.

PE.11 PRICES

Prices for formwork are to include for all straight cutting and waste, beam columns and wall intersections, fixing, horsing and wedging, also for easing, striking and removing, except where described as "left in".

**PF STEEL REINFORCEMENT
PF.1 STANDARD SPECIFICATION**

All work involving steel reinforcement in reinforced concrete shall conform with the requirements of SABS 1200G.

PF.2 DEFINITION

Reinforcement shall mean all or any of the following: steel wire, round twisted or deformed steel bars and steel wire fabric mesh which are to be embedded in concrete for the purpose of assisting the concrete to resist forces which may be imposed on it or to prevent its cracking.

- (a) Reinforcing bars shall be of the grades specified on the drawings and in accordance with the "Standard Specification for Steel Bars for Concrete Reinforcement" SABS 920.
- (b) Steel wire fabric mesh shall be of the grade specified on the drawings and in accordance with SABS 1024.

PF.3 STORAGE OF REINFORCEMENT

Further to the requirements of SABS 1200 G the Contractor shall stack separately and label different types of reinforcement for positive identification.

Care shall be taken in stacking the reinforcement to avoid bending or twisting the bars or cages at the bottom of the stack due to the weight of the steel in the upper part of the stack.

PG PRECAST CONCRETE WORK

Cement, sand and stone shall be as described under the Concrete Work.

The manufacturer of precast units shall be so arranged as to ensure that the concrete units are cured for the correct time before handling.

Precast concrete units shall, where appropriate be constructed in accordance with British Standards as follows, being hydraulically pressed where possible.

<u>Type of Unit</u>	<u>Standard</u>
Concrete blocks	BS 2028
Concrete kerbs and the like	BS 340
Concrete flags	BS 368
Concrete cills	BS 1237
Concrete lintels	BS 1239

Other precast concrete units shall be manufactured from class 30 concrete or the class of concrete and to the sizes and details shown on the drawings, and the concrete shall comply in every respect with the provisions of the Contract whether such units are manufactured on Site or obtained from approved manufacturers.

The Contractor shall satisfy himself that the reinforcement detailed on the drawings is adequate to deal with the stresses which are likely to be imposed on the units by the method of handling, lifting and transporting adopted.

Units shall be adequately protected during storage, handling, lifting and transporting to avoid any straining or damage to the units. Any units so strained or damaged shall be rejected and replaced at the Contractor's expense. Projecting reinforcement, bolts, etc., shall be protected so that they are maintained in their correct position.

All units shall be clearly marked with date of manufacture and identification marks so that the marking will not be visible on the final structure.

PG.1 TOLERANCES

All units shall be within the tolerances below:

PG.1.1 Length

For dimensions not exceeding 300 mm	+ 3 mm to 0 mm
For dimensions exceeding 300 mm but not exceeding 3 m	± 3 mm
For dimensions exceeding 3 m	+ 3 mm to 6 mm

PG.1.2 Squareness

When considering the squareness of a corner, the longer of two adjacent sides being checked should be taken on the base line. The shorter side should not vary in its distance from a perpendicular from the corner by more than 6 mm.

PG.1.3 Twist

Any corner should not be more than the tolerance stated below from the plane containing the other three corners:

PG.1.4 Flatness

The maximum deviation from a 1,5 m straight edge placed in any position on nominally plane surfaces, shall not exceed 3 mm.

PG.1.5 Warpage

Warpage shall not be more than 1 mm for each 600 mm ran.

PG.1.6 Absorption

Total water absorption shall not exceed 6,5% by weight.

Care must be taken during manufacture that no damage or staining or finished surfaces is caused by any releasing agents.

Prices are to include for all casing and moulds and for reinforcement as described. Unless otherwise described, finished work is to be finished to the proper surface described in the moulds.

All units shall be laid, bedded, jointed and fixed in accordance with the lines, levels and other details shown on the drawings.

Pre-stressed concrete lintels are to precast stock lengths wherever possible, but in all cases, are to have a minimum bearing of 220 mm each side of opening. Prices for lintels are also to include for propping in accordance with the manufacturer's instructions.

PH BLOCKWORK

PH.1 SAND

Sand shall be as obtained from an approved source and shall conform with the requirement of SABS 1090 - 1976 and be well graded from 5 mm down, in accordance with table 1 therein.

PH.2 LIME

All lime used shall be hydrated bedding mortar lime complying with the requirements of SABS Specification for Building Lime 523.

PH.3 CEMENT

Cement is to be as described under "Concrete Work".

PH.4 MORTAR PLASTICS

Mortar Plastics shall comply with BS 4887 and shall be used in the proportions and manner recommended by the manufacturer.

PH.5 LIME MORTAR

Unless otherwise described, lime mortar shall be composed of four parts sand to one part lime by volume and allowed to slake for at least ten days before use. The mortar shall be kept moist until required for use by covering with wet sacks or other approved means.

PH.6 CEMENT MORTAR

Unless otherwise described, cement mortar shall be composed of 6 parts sand to 1 part cement by volume mixed in small batches which can be reasonably used up within half an hour of mixing. No mortar is to be retained and subsequently re-used the following day by the mixing in of additional cement.

PH.7 COMPOSITION MORTAR

Unless otherwise described, composition mortar is to be composed of 12 parts sand to 2 parts lime and 1 part cement by volume, the cement added to the mixture in small batches, immediately before use.

PH.8 AGGREGATES FOR BLOCKS

Aggregates for blocks shall be obtained from an approved source, shall be hard, durable and chemically inert, shall conform with the requirements of SABS 1083 and shall be washed clean.

PH.9 WATER

Clean fresh water from the Local Authority supply is to be used throughout the Works. Where there is no such supply the water shall be clean and free from injurious amount of acids, alkalis, sugar and other organic substances.

PH.10 CONCRETE BLOCKS

Unless otherwise described, concrete blocks are to be good, hard, sound, dry and well cured and shall comply with SABS 527. All soft wet or insufficiently cured blocks will be rejected and samples of all blocks are to be submitted to the Engineer and approved by him before the blocks are delivered on site in bulk. Blocks for foundations are to be selected for hardness.

All blocks used will be Class B unless otherwise approved by the Engineer.

Unless otherwise described, all blockwork is to be in stretcher bond with galvanised wall ties in accordance with SABS 28 built in between skins and evenly spaced at a density of not less than 4 ties per m² of wall area. Blocks shall under no circumstances be wetted in any manner before laying and at the stoppage of work at any time the top of the wall shall be covered to prevent moisture entering the blocks. The blockwork is to have the joints flushed up at every course solid throughout the whole width of each course and to be laid on a solid bed of mortar. The joints of all walls to be plastered are to be raked out as the work proceeds to form key for plaster. All walls to be carried up regularly so that no part be built more than 1,5 m higher than the adjoining walls. Mortar joints generally are not to exceed 10 mm thickness.

The price of blockwork is to include for all plumbed angles, forming reveals, and all square cutting. Where the building is of the concrete cage or frame construction and the blockwork is mostly in large panels between the concrete columns and beams, prices are to include for packing up against columns and under beams as required. Where concrete columns and beams are built before blockwork, prices are to include for packing blockwork up against columns and under beams as required.

Unless otherwise described, the skins of hollow walls are to be tied together with and including wall ties in accordance with SABS 28. Wall ties are to be 150 mm longer than the width of the cavity, staggered vertically and spaced not more than 1 m apart in every third course of blockwork. Prices are to include for keeping the cavities free of rubbish, mortar droppings, etc. Openings are to be left as required for this purpose and afterwards built up and made good.

Cross wall shall be built up flush against the existing wall with a control joint at the link. If the cross wall is of hollow concrete blocks, the two walls shall be tied together with metal anchors, starting at the first course above the damp-proof course and spaced at a vertical distance not exceeding 1 200 mm. The anchors shall be at least 3 mm thick, at least 30 mm wide and approximately 700 mm long, with a 50 mm right angle bend at each end, and these bends shall be embedded in mortar or concrete that is placed in the cores. If the cross wall is of solid blocks, the two walls

shall be tied together with strips of 0,65 mm minimum thickness expanded metal reinforcing mesh placed in every second horizontal joint, stretching across the vertical joint between the walls. The strips shall be at least 450 mm long and of such width that there is mortar cover of at least 20 mm over the edges of the strips.

PH.11 CUTTING OF BLOCKS

Where cutting is necessary, blocks shall be cut with a bolster or, for facing work, preferably with a mechanical cutting disc. Where hollow blocks are cut and cavities or grooves are exposed at ends, angles, joints, reveals or elsewhere, the cavities shall be filled with mortar and finished flush with the block face.

PH.12 RAKING BACK OF BLOCKWORK

Corners and other advanced work shall be raked back and not raised above the general level of the remaining blockwork by more than 1 m at one lift.

PH.13 CORNERS

All corners shall be accurately constructed and the height of courses shall be checked by a gauge rod as the work rises. The bonding of corners shall be done in such a way as to preserve symmetry in the appearance of the work.

PH.14 REVEALS

The depth of reveals and rebates shall conform as far as practicable to the block size, in order to maintain the strength of the masonry and to avoid cutting of blocks.

PH.15 JOINTING AND POINTING

As the work proceeds mortar joints on the face of the wall shall be compacted to give a (concave, or, trowelled, or, V, or, flush) joint. Tooling shall be delayed until the mortar has stiffened slightly.

When joints are to be subsequently pointed, the face joints shall be raked out to a depth of from 13 to 20 mm and later refilled with mortar and pointed to give an approved joint. Tooling shall be delayed until the mortar has stiffened slightly.

PH.16 STORAGE OF BLOCKS

Blocks shall be carefully unloaded and handled so as to prevent chipping and breakage. Blocks shall be stacked on a level site. The top of each stack shall be kept covered at all times during rainy weather.

PH.17 BAGGING

Bagging down blockwork and exposed faces of concrete occurring in block walls, is to include for filling all joints, crevices and any defects with 3 : 1 sand and cement mortar and then rubbing over with wet rough sacking or brushes soaked in liquid 5 : 1 sand and cement grout.

PH.18 B LOCK REINFORCING FABRIC

Unless otherwise described, blockwork reinforcement is to be of approved S.A. manufactured welded high-tensile steel wire reinforcing fabric of the widths stated, cut to lengths and lapped full width at angles and passings. Rates are to include for building into block walls.

PH.19 HOOP IRON CRAMPS

Cramps to wood frames to be 2 mm galvanised hoop iron 30 mm wide and 230 mm girth with one end twice screwed to frame and other end built into blockwork in cement mortar and turned up into brick joint.

PH.20 HOOP IRON ROOF TIES

Ties to roof rafters is to be 4 mm galvanised wire 1 500 mm girth with one end wrapped around and spiked to roof timbers and other end built into head of block wall in cement mortar, or embedded into concrete beam or slab.

PH.21 WATERPROOFING CODE OF PRACTICE

The Contractor will be required to construct the work measured under the Blockwork trade in accordance with the requirements of SABS 021-1973 "The Waterproofing of Buildings".

PH.22 CLEANING DOWN

Acid shall not be used to clean down concrete masonry walls.

PH.23 REMOVAL OF MORTAR DROPPINGS

Mortar droppings which fall on the wall ties in a cavity wall shall be removed and temporary openings shall be provided to permit the removal of the droppings from the bottom of the cavity.

PH.24 WEEPHOLES

Where required to drain away moisture, and where detailed on the drawings, weepholes shall be located in the first course above any damp proof course or bond beam, or the like, the holes being approximately 50 mm high and located in each end.

PH.25 DAMP-PROOF COURSES

The block course on which a damp-proof course is to be laid shall be flushed up with mortar to form an even bed free from projections liable to puncture or damage the damp-proof course.

Where a damp-proof membrane is extended over the full thickness of a hollow masonry wall not less than 150 mm thick, the membrane may be regularly pierced over the centre of each cavity in blocks forming the wall. The piercing shall not exceed 40 mm in diameter and the surface of the membrane adjacent to the piercing shall be depressed towards the piercing.

PH.26 BLOCKWORK OVER OPENINGS

All masonry built over openings shall be adequately supported for not less than 7 days.

Where hollow blocks are used the cores adjacent to the openings shall be filled with concrete (Class 20).

Lintels over openings shall bear on the full thickness of the wall with a bearing length, at each end, of at least 150 mm. Lintels may be of precast reinforced concrete, or may be formed in situ by the use of special lintel blocks filled with concrete and reinforced near the bottom with at least two 12 mm diameter mild steel rods.

PH.27 BEARING PLATES ON BLOCKS

Bearing plates on blocks shall be bedded in mortar similar to that used for the masonry and shall be set level.

PH.28 CONTROL JOINTS

Control joints shall be provided at positions indicated on the drawing and shall be constructed as shown.

PH.29 PROTECTION AGAINST DAMAGE

Finished masonry shall be protected where necessary to avoid damage during the building operations.

PH.30 PROTECTION OF NEW WORK

In order that the hardening and strength development of the masonry will not be adversely affected, all new work shall be suitably protected from rain and against the possibility of the work drying out rapidly.

PH.31 BRACING DURING CONSTRUCTION

Masonry walls constructed in locations where they may be exposed to high winds during erection shall not be built higher than ten times their thickness unless adequately braced, or until provision is made for the prompt installation of permanent bracing at the floor or roof level immediately above the storey under construction. Back-filling shall not be placed against foundation walls until they have been braced to withstand the horizontal pressure.

PI BRICKWORK

PI.1 SAND

Sand shall be as obtained from an approved source and shall conform with the requirement of SABS 1090-1976.

PI.2 LIME

All lime used shall be hydrated bedding mortar lime complying with the requirements of SABS specification for Building Lime 523.

PI.3 CEMENT

Cement is to be as described under "Concrete Work".

PI.4 LIME MORTAR

Unless otherwise described, lime mortar shall be composed of four parts sand to one part lime by volume and allowed to slake for at least ten days before use. The mortar shall be kept moist until required for use by covering with wet sacks or other approved means.

PI.5 CEMENT MORTAR

Unless otherwise described, cement mortar shall be composed of 6 parts sand to 1 part cement by volume mixed in small batches which can be reasonably used up within half an hour of mixing. No mortar is to be retained and subsequently re-used the following day by the mixing in of additional cement.

PI.6 COMPOSITION MORTAR

Unless otherwise described, composition mortar is to be composed of 12 parts sand to 2 parts lime and 1 part cement by volume, the cement added to the mixture in small batches, immediately before use.

PI.7 BRICKS

Unless otherwise described, bricks are to be good, hard, sound, well burnt commons and shall comply with SABS 227. All soft or inferior bricks will be rejected and samples of all bricks are to be submitted to the Engineer and

approved by him before the bricks are delivered on the site in bulk. Bricks for foundations to be selected for hardness.

Unless otherwise described, all brickwork is to be in stretcher bond with galvanised wall ties in accordance with SABS 28 built in between skins and evenly spaced at a density of not less than 6 ties per m² of wall area. Bricks are to be well wetted before laying the next course. The brickwork is to have the joints flushed up at every course solid throughout the whole width of each course and to be laid on a solid bed of mortar. The joints of all walls to be plastered are to be raked out as the work proceeds to form key for plaster.

All walls to be raked out as the work proceeds to form key for plaster. All walls to be carried up regularly so that no part is built more than 1,5 m higher than the adjoining walls. Mortar joints generally are not to exceed 10 mm thickness.

The pricing of brickwork is to include for all plumbed angles, forming reveals and all square cutting. Where the building is of the concrete cage or frame construction and the brickwork is mostly in large panels between the concrete columns and beams, prices are to include for packing up against columns and under beams as required.

Unless otherwise described, the skins of hollow walls are to be tied together with and including wall ties in accordance with SABS 28. Wall ties are to be 150 mm longer than the width of the cavity, staggered vertically and spaced not more than 1 m apart in every third course of brickwork. Prices are to include for keeping the cavities free of rubbish, mortar droppings, etc. Openings are to be left as required for this purpose and afterwards built up and made good.

PI.8 BAGGING

Bagging down brickwork and exposed faces of concrete occurring in brick walls, is to include for filling all joints, crevices and any defects with 3:1 sand and cement mortar and then rubbing over with wet rough sacking or brushes soaked in liquid 5:1 sand and cement grout.

PI.9 BRICK REINFORCING FABRIC

Unless otherwise described, brickwork reinforcement is to be of approved SA manufactured welded high-tensile steel wire reinforcing fabric of the widths stated, cut to lengths and lapped full width at angles and passings. Rates are to include for building into brick walls.

PI.10 HOOP IRON CRAMPS

Cramps to wood frames to be 2 mm galvanised hoop iron 30 mm wide and 230 mm girth with one end twice screwed to frame and other end built into brickwork in cement mortar and turned up into brick joint, or shot-bolted to concrete as necessary.

PI.11 HOOP IRON ROOF TIES

Ties to roof trusses to be 1,6 mm galvanised hoop iron 30 mm wide and 300 mm girth with one end wrapped around and spiked to roof timbers and other end built into head of brick wall in cement mortar, or embedded into concrete beam or slab.

PI.12 WATERPROOFING - CODE OF PRACTICE

The Contractor will be required to construct the work measured under the Brickwork trade in accordance with the requirements of SABS 021-1973 "The Water Proofing of Buildings".

PI.13 FACE BRICKWORK

Facing bricks generally to be best quality sound facing bricks, size approximately 222 x 106 x 73 mm thick rising four courses to 340 mm, even in size, shape and colour and equal to samples to be submitted to and approved by the Engineer before the signing of the Contract.

Special care must be taken to preserve arises and faces of these bricks during transit and handling. Any facing bricks brought on to the site that are not in accordance with the samples will be rejected by the Engineer, the delivery and removal of which will be solely at the Contractor's expense.

The face bricks are not to be used by the load, but are to be used from several stockpiles to ensure a uniform and even colour mixture. The joints are to be pointed as described while the work proceeds.

All cutting to facings is to be done with a carborundum or other approved saw. Where cutting in faced work is required, it shall be done over three or more bricks in order to maintain the flow of the brickwork.

All face brickwork is to be protected from damage during the progress of the work to the entire satisfaction of the Engineer, and cleaned down at completion, care being taken not to damage finished surfaces. No oiling will be allowed on any face brickwork.

PI.14 QUARRY TILES AND PAVINGS

To be approved quality, manufactured in the Republic of South Africa, even in thickness, truly square, free from cracks, twists and blemishes, uniform in colour and equal to samples to be submitted to and approved by the Engineer. Special care must be taken to preserve arises and faces during transit and handling. Any paving tiles, etc on the site which are not in accordance with the approved samples will be rejected by the Engineer, the delivery and removal of which will be solely at the Contractors risk.

PI.15 POINTING, ETC.

Except where otherwise specifically described, tiles are to be laid with continuous joints in both directions, bedded and jointed solidly in 3 : 1 sand and cement mortar and pointed on all exposed faces with slightly recessed joints with semi-dry cement mortar pressed in. On no account must liquid grout be poured in.

Tiles, etc must be well protected with clean sand or other approved material to prevent all possibility of damage or discolouration and thoroughly cleaned off at completion. No oiling will be allowed.

PI.16 PRICES

Are to include for all general square cutting and fitting. All cutting to tiles to be done with a carborundum or other approved brick saw.

PI.17 CLEANING OFF

Great care is to be taken to keep face brickwork, quarry tiles, etc, free from mortar as the work proceeds and at completion they are to be cleaned down with spirits of salts and water.

PJ WATERPROOFING

PJ.1 GENERAL

Where applicable, damp proofing and waterproofing shall comply in all respects with SABS 021 Code of Practice, "The Waterproofing of Buildings".

PJ.2 DAMP-PROOFING TO WALLS

Unless otherwise described bituminous sheet damp-proof courses are to comply with SABS 248 Type FV sheeting, lapped 150 mm at angles and passings, including cranking up as necessary and all cutting and waste.

Unless otherwise described uP.V.C. plastic sheet damp-proof courses are to be of rippled S.A. manufactured approved plastic sheeting complying with SABS 952 Type B, lapped 150 mm at angles and passings including cranking up as necessary and all cutting and waste.

PJ.3 DAMP-PROOFING TO FLOORS, ETC

Unless otherwise described damp-proofing to floors, etc, is to consist of S.A. manufactured approved plastic sheeting complying with SABS 952 Type C, in wide widths, laid with minimum 300 mm laps at all edges and laps sealed with pressure sensitive tape, all in strict accordance with the manufacturer's instructions.

Prices for all damp proof membranes are to include for all laps and all cutting and waste.

PK ROOF COVERINGS

PK.1 GENERAL

The Contractor is referred to the relevant clauses of SABS 021-1973 dealing with the waterproofing of external cladding, roofing materials and flashings.

PK.2 FIBRE CEMENT ROOFING

Corrugated fibre cement roofing sheets and fittings are to be in accordance with SABS Specification No. 685 and 6,35 mm or 7 mm thick with pitch of corrugations at 178 mm. Roofing to be mitre cut at corners, lapped 44 mm at sides and with end laps as later described, and secured to wood purlins with No. 2 gauge galvanised drive screws 121 mm long each provided with one coned shaped uPVC and one galvanised steel cupped washer including drilling holes (no punching permitted). Roofing to steel angle purlins to be secured with 8 mm diameter galvanised hook bolts fitted with similar washers. Drive screws or hook bolts to be spaced one per sheet per purlin except along eaves, ridge and verges, where two per sheet per purlin are to be used. All roofing to be executed in accordance with the manufacturer's instructions.

Approved pattern fibre cement roofing sheets are to be of the same material and specification as above described except side laps to be 79 mm and drive screws to be provided with one neoprene and one galvanised steel cupped washer. Drive screws or hook bolts to be spaced two per sheet per purlin.

PK.3 CLAY ROOFING TILES

Clay roofing tiles shall be in accordance with SABS 632 of pattern, size and colour described and shall be laid to "broken bond" with vertical joints and bottom edge of each course ranging perfectly straight.

PK.4 CONCRETE ROOFING TILES

Concrete roofing tiles shall be in accordance with SABS 542 except that the concrete in the body of the tile need not be coloured where tiles are to have natural stone granular finish, and of pattern, size and colour described.

Tiling shall be laid in accordance with SABS 062 to "straight bond" with vertical joints and bottom edge of each course ranging perfectly straight.

Corrosion resistant tile clips of the MK 5 type are to be used at all exposed eaves and verge soffits.

PL CARPENTRY AND JOINERY

PL.1 TIMBER

All timber is to be well seasoned and free from sap, reasonably free from wavy edges, large, loose or dead knots, splits, shakes or other defects and to be sawn die square. The scantlings of all sawn timbers to hold full size when sawn.

PL.2 MOISTURE CONTENT

All timber to be kiln dried to a moisture content of 12 per cent.

PL.3 NOMENCLATURE OF TIMBERS

The names used in this Bill for imported timbers are those given in Supplement No. 1, to SABS 02 "Nomenclature of Standard Trade Names of Imported Commercial Timbers used in South Africa" and the Contractor is referred thereto.

PL.4 STORAGE OF TIMBER

All timber delivered to the site is to be properly stacked above the ground, either on rough bearers or platforms under cover and protected from inclement weather.

PL.5 TIMBER DIMENSIONS

For structural timber dimensions shall be of nominal sizes within the tolerances specified in SABS 563 unless net dimensions (actual sizes) are specified.

PL.6 PRE-TREATMENT OF TIMBER

Except where exemption has been obtained from the Division of Plant Control, Timber Control Offices, all permanent timber installed in the Buildings is to be treated before the arrival on site with an approved preservative in terms of Government notice No. R658 of 15 September 1961, in accordance with SABS "Code of Practice for the Preservative Treatment of Timber."

The Contractor is to obtain a certificate from the merchant supplying the treated timber, to the effect that the timber has been treated against wood destroying insects. The Engineer has the right to remove samples of the treated timber for the purpose of having chemical tests carried out by the Division of Entomology or any other authority. The expense of such tests are to be borne by the Contractor, if the penetrations and absorptions do not comply with the standards laid down above.

PL.7 SOUTH AFRICAN SOFTWOOD

Unless otherwise described, all sawn structural timber of cross-sectional size 76 mm x 228 mm and under is to be South African Softwood of "Merchantable Grade" in accordance with SABS 563 and branded accordingly.

South African softwood branding and battens are to be in accordance with SABS 653 if not exceeding 50 mm in width and in accordance with SABS 563 if exceeding 50 mm in width, and branded accordingly.

PL.8 FINGER JOINTING ETC.

Timber for finger-jointing must be free from knots in, and for 100 mm from the finger joint which should be in accordance with the German Specification DIN (A60) 68140. The glue is to be approved for the specific use of the timber. Resorcinal formaldehyde or resorcinal phenolformaldehyde complying with B100 requirements of BSS 1204 - 1956 are suitable glues for all purposes.

Contractors wishing to use finger-jointed timber should supply a guarantee that the finger jointing complies with the above specification and that the glue is suitable for the particular member.

PL.9 FIR

Unless otherwise described, "fir" is to be understood to mean Baltic Red Deal of "Unsorted" quality or "Douglas Fir of Merchantable" quality.

PL.10 OREGAN PINE (DOUGLAS FIR)

Oregon Pine (Douglas Fir) for constructional purposes is to be "merchantable" quality. Oregon Pine (Douglas Fir) for joinery is to be "No 2 Clear and Better" quality specially selected and kiln dried.

PL.11 HARDWOODS

All hardwood to comply with SABS 737, Grade 2 and Better. Red Meranti and Iroko to be best quality, specially selected, well seasoned and free from sapwood. Red meranti to be even in grain and colour, selected from "Standard and Better" quality from Malaya.

All hardwood to be oiled, waxed or varnished, etc, is to be selected to match in colour, grain and texture.

PL.12 LAMINATED TIMBER

Structural glued laminated timber shall be in accordance with SABS 876.

PL.13 PLYWOOD

Plywood to be best quality of South African manufacture free from all blistering, cracking, twisting and other defects and glued with best waterproof glue under pressure.

PL.14 HARDBOARD

Hardboard to be in accordance with SABS 540 and of Tempered Quality unless otherwise described and if in sheets over 0.75 m² in area not sealed to a solid permanent backing internally, and all hardboard permanently fixed externally to be pre-stretched before fixing by thoroughly wetting the boards by scrubbing the screen with water and a stiff brush or broom until a dark chocolate colour is obtained and then stacking the boards screen side to screen side for 12 to 24 hours and then air dried for 1 to 2 hours.

PL.15 BLOCKBOARD

Blockboard to be 21 mm thick 5 ply or 19 mm 3 ply, manufactured from kiln dried South African Pine timber core in 22 mm wide laminations 16,4 mm thick, two 1,5 mm cross grain veneer underlays and 1 mm long grain veneers face and back. All Commercial Hardwood veneers used in the manufacture of boards and shelving to be treated against insect infestation during manufacture of boards and shelving to be treated against insect infestation during manufacture with Boric Acid/Boron in accordance with the recommendations of the Department of Entomology. Bonding throughout is to be by means of heat and hydraulic pressure. All products to be sanded to a smooth finish. Blockboard with decorative veneers on face and back to be as above and faced with

0,6 mm decorative long grain veneers. Decorative veneer one side only blockboard is to be balanced with 1 mm veneer on reverse side. Edge strips to blockboard to be formed with 9,5 mm thick strips to match the face veneer and to be the full thickness of the board.

PL.16 PARTICLE BOARD PRODUCTS

Particle board to be of approved South African manufacture, comprising wood chips of uniform size, impregnated with either urea, poly-phenolic or other approved resin adhesive and bonded under heat and hydraulic pressure. Any work that is warped, twisted, chipped or in any other way defective, will be rejected.

PL.17 DECORATIVE PLASTIC LAMINATES

Decorative plastic laminates are to be of approved South African manufactured decorative melamine faced mica based laminate covering of approved colour, free from all defects and glued to wood or boarding with approved adhesive recommended by manufacturer.

PL.18 GYPSUM PLASTER BOARD AND CORNICES

Gypsum plaster board is to be in accordance with SABS 266. Gypsum cove cornices are to be in accordance with SABS 622.

PL.19 FIBRE CEMENT CELLULOSE SHEETS

Fibre cement cellulose sheets are to be in accordance with SABS 685.

PL.20 JOINERY

All joinery, except that described as "stock", is to be purpose made to detail constructed in accordance with the best approved practice, morticed and tenoned, dowelled, dovetailed, tongued, grooved, housed, glued, pinned, screwed or otherwise fabricated as is best suited for the particular part. All morticed and tenoned joints are to be pinned in addition to wedging and gluing.

Stock joinery is to be the best of its quality and kind and to approval. No joinery is to be primed until it has been inspected and approved.

The Contractor is to allow for sinking and pelleting heads of all nails and screws where exposed in hardwood joinery and for cross tonguing all solid wood sections unobtainable in single widths.

Unless otherwise described all joinery is to be put in hand as soon as possible after the signing of the contract but all final cramping, wedging and gluing up is to be done just before the finished article is required for fixing.

Wherever possible, joinery shall not be placed or fabricated in position until the plaster has dried out.

Should the joints of any joiner's work, open or give before payment of the Final Certificate, such defective work shall be taken down, refitted and redecorated, or new joinery put in its place at the Contractor's expense.

Floor boards, skirtings, cornices and rails of all kinds are to be in long lengths where possible, and are to have splayed heading joints where necessary. Where these occur they shall be made virtually invisible.

All horns of door frames are to be checked and splayed back where frames are fixed projecting or flush with surface and built in.

PL.21 WROT WORK

All wrot woodwork is to be finished smooth and free from tool marks. Sizes of timbers are finished sizes unless otherwise stated.

Exposed woodwork, except where otherwise described, is to be wrought, well glass papered and brought to a smooth and fair face with all roughness of working tools removed.

Only brass screws may be used for hardwood Joiners' work.

The term "angle-rounded" where applied to angles in wrought woodwork denotes anything from 3 mm up to 10 mm radius and includes for housed and mitred joints. The term "arris-rounded" denotes that sharp angles are to be rounded off and only that no mitring is required. All exposed angles of wrought woodwork are to be arrisrounded unless otherwise described.

PL.22 MITRES, ETC

Except where mitres, etc are separately measured, prices for all quadrants, architraves, cornices, skirtings, etc, are to include for all mitred and scribed angles, splays, stops, etc.

PL.23 PLUGS, NAILS ETC.

The prices for woodwork are to include for all plugs, nails, spikes, screws, etc that may be necessary. Where described as plugged, rates for joinery work are to include for plugging with hardwood or approved proprietary plugs to brickwork or concrete as the case may be.

PL.24 SHOT FIXING

Where timbers are described as shot fixed to concrete, rates for this work are to include for securely fixing timbers to concrete with an approved cartridge assisted tool; rates are to include for all nails, spikes, blanks etc.

PL.25 PROTECTION

All joinery liable to injury must be covered with temporary casing to the entire satisfaction of the Engineer. All exposed faces of joinery, which are eventually to be stained, oiled or varnished, must be oiled to preserve them during building operations.

Great care must be taken to protect these surfaces from damage or discolouration.

PL.26 DOORS

Framed, ledged, braced and battened doors are to be formed of stiles, rails, ledges or braces (when required) of the sizes later specified and filled in with 22 mm grooved, tongued and V-jointed boarding in narrow widths tongued on outer edges and fixed in grooves in stiles and top rail to finish flush with outer face of door and twice countersunk screwed at each intersection with ledges, braces and bottom rail, and inner edges of framing and abutting edges of boarding chamfered to form V-joint.

PL.27 FLUSH DOOR

PL.27.1 General requirements

Flush doors shall be solid laminated, semi-solid, chip core or hollow core and shall be capable of withstanding the racking, deflection, puncture and moisture resistance test laid down in SABS Specification 545. All glue used in the manufacture of doors shall comply with the requirements of the above specification.

Unless otherwise specified, face veneers shall be rotary cut, and shall be of timber specified, or where doors are to be painted shall be of timber suitable for painting.

Edge-strips to conceal the vertical edges of doors shall be not less than 10 mm thick and of same timber as face veneer; edge strips to meeting edges of doors in two leaves where edges are to be rebated, shall be not less than 20 mm thick.

Face veneer and edge strips to doors not being painted shall be free from all defects, but small defects in the veneer and edge strips will be permitted in doors that are to be painted, provided they are filled in such a way that the paint finish will not be impaired.

Faces of doors shall be machine sanded to a smooth and even surface.

All gluing together of core strips and gluing on of veneers, edge strips etc, shall be done under hydraulic pressure.

Bow, cup and twist in doors shall not exceed the following:

Bow	: 5 mm in the full height of doors,
Cup	: 3 mm in the full width of doors, and
Twist	: 6 mm

The top and bottom edges of doors showing end grain shall be sealed with lacquer, or other suitable material, before leaving the manufacturer's works and similarly sealed after doors are fitted into frames if the edges of doors are disturbed during fitting.

All timber in doors in services having all timbers treated against infestation by insect pests shall be treated against such pests as laid down in the specification referred to above.

PL.27.2 Construction

The four types of doors shall be constructed as follows:

i) Solid Laminated

Solid laminated flush doors shall have cores built up of vertical strips of well seasoned saligna gum, South African pine or other suitable and approved timber, not exceeding 25 mm in width, glued together into one solid unit without voids of any kind, and cross-banded on both sides with veneer not less than 3 mm thick (before sanding), and faced on both sides with veneer not less than 0,8 mm thick (before sanding). The cross-banding shall be glued to core and face veneer to the cross-banding.

Edge strips shall be provided to both edges of doors, and cross-banding shall stop against the edge strips (face veneer applied after the edge strips).

ii) Semi Solid Core

Semi solid laminated flush doors shall have cores built up of vertical strips of well seasoned saligna gum, South African pine or other suitable and approved timber, not exceeding 25 mm in width spaced apart evenly with similar vertical spacing strips to have a solid face area of not less than 40 - 50%, and with suitable top, lock, bottom and style rails and all glued together into one unit, and cross-banded on both sides with veneer not less than 3 mm thick (before sanding), and faced on both sides with veneer not less than 0,8 mm thick (before sanding). The crossbanding shall be glued to core and face veneer to the cross-banding.

Edge strips shall be provided to both edges of doors, and cross-banding shall stop against the edge strips (face veneer applied after the edge-strips).

iii) Chip Core

Chip core doors shall be constructed with cores of wood chips of uniform size, bonded together under hydraulic pressure with glue, fitted all round with framing of suitable and approved timber, securely glued to cores, and covered on both sides with plywood and face veneer, of a thickness not less than 3 mm (before sanding) and with both vertical edges of doors provided with edge-strips and with both vertical edges of doors provided with edge-

strips and with face veneer taken over the edge of the strips, or two thicknesses of chip board, not less than 12 mm thick, glued to chipwood battens, spaced at not exceeding 100 mm apart and to rebated framing all round, and provided with suitable size lock and hinge blocks as required and with additional framing and/or blocks where doors are to have glazed openings or are to be hung on spring hinges and the like, and covered on both sides with face veneer not less than 0,8 mm thick (before sanding). The framing to vertical edges of doors shall be of the same timber as face veneer and veneer shall cover the edge of the framing.

iv) Hollow Core

Hollow core doors shall have framework of well seasoned South African pine or other suitable and approved timber, comprising stiles and top and bottom rails, not less than 38 mm in width, and intermediate supporting members as required, all of laminated timber glued together for the full length, and provided at one edge with suitable size lock block of similar laminated timber, and filled in with cores of moulded pulp units giving not less than 50% area contact with the plywood covering, or with cores made up of strips and bars arranged horizontally and vertically to form a grid, with the strips or bars at such spacings as will ensure a flat even surface entirely free from undulations to the plywood covering. Additional framing shall be provided to doors having glazed openings.

Doors shall be covered on both sides with plywood and face veneer, of a total thickness of not less than 4 mm (before sanding), and edge-strips shall be provided to both edges of doors; plywood shall stop against edge-strips and face veneer shall stop against or be taken over the edge-strips.

PM FLOOR COVERINGS, PLASTIC LININGS, ETC

PM.1 RESILIENT FLOOR FINISHINGS AND SKIRTINGS

PM.1.1 Semi-flexible Vinyl Flooring

Semi-flexible vinyl flooring is to comply with SABS 581 of the sizes stated and of approved colour and equal to samples to be submitted to and approved by the Engineer.

PM.1.2 Flexible Vinyl (UPVC) Flooring

Flexible vinyl flooring is to comply with SABS 786, of the sizes stated and of approved colour and equal to samples to be submitted to and approved by the Engineer.

PM.1.3 Marble Linoleum

Cork backed linoleum is to comply with Specifications DIN - 51955, 51953, 0100, 51960 and 53389 and VDE 0100. The linoleum is to be of approved colour and equal to samples to be submitted to and approved by the Engineer.

PM.1.4 Laying and Fixing

The flooring is to be laid under guarantee by a firm of specialists on and including a cementing coat applied with a notched trowel, all in accordance with the material supplied and methods recommended by the manufacturer.

RATES: are to include for all straight cutting and waste, preparatory work to screeded floor surfaces (screeds elsewhere), fitting around door frames, joinery fittings and other obstacles and for protection and cleaning off at completion with soap and water.

PN IRONMONGERY

All ironmongery is to be to the Engineer's approval, and unless otherwise described, prices are to include for fixing to softwood or hardwood. Articles are to be fixed with screws of similar metal finish. No two locks are to have interchangeable keys, and all locks are to have duplicate keys. All screws, bolts, spiles, nails, etc., required for the proper completion of the work are to be supplied by the Contractor.

Rates for ironmongery are to include for fixing, oiling and easing at completion.

Rates for ironmongery fixed to steel linings are to include for perforations, and tappings in linings as required. Non-standard lock striking plates and mortar guards when required are separately measured.

Keys to all locks, including duplicates, sub-master and grand-master keys where applicable, are to be suitably labelled and delivered to the Engineer upon completion or when requested.

Where ironmongery is referred to as proprietary types, such ironmongery is to be exactly of such proprietary types unless otherwise approved.

PO METALWORK

PO.1 WROUGHT IRON

Wrought iron is to be of the best quality and to be approved before fixing. It is to be forged clean from the anvil and to be sound and to have full threads to all screw work.

PO.2 NON-STRUCTURAL STEELWORK

All non-structural mild steel sections shall comply with BS4360; 1972 Grade 43A and the requirements of SABS 221 and 222.

All steelwork must be true to drawing, free from warps and twists, and generally constructed to any of the standards specified in Chapter 6 of Standard Building Regulations, as published in Government Gazette No. 2894 of 23rd October 1970, or amendments thereto.

All steel must be cleaned in accordance with SABS 064 to remove scale, rust, oil or grease and unless otherwise described, painted with an approved red lead based Type II Grade I priming coat in accordance with SABS 312 prior to dispatch from the works. Upon delivery to the site and again after erection all bared surfaces shall be made good.

Rates for steelwork are to include for all necessary cutting to lengths, shaping, holing, tapping, threading, forging, turning, fitting, assembling, riveting, welding and filing smooth and also for screws unless otherwise described.

All rails, etc., described as continuous are to be in long lengths with flush welded joints. All screwed work to have full threads. All welding is to be continuous unless otherwise described.

All bends to flat sections of metalwork are across flat unless otherwise described.

The mass of all steel has been calculated according to the theoretical mass list issued by Iscor and Steel Sales Company of Africa (Pty) Limited, and no allowance has been made for rolling margins, binding wire and waste. Any variations in the masses of the steel actually used from the above-mentioned mass list is to be for the Contractor's account and the listed masses will be adhered to in all calculations affecting the mass of steel.

PO.3 HOT DIP GALVANISING TO METALWORK

Metalwork specified to be galvanised shall, after fabrication and before leaving the manufacturer's works, be galvanised by the hot dip process in accordance with SABS 763.

Before being galvanised all surfaces of the metalwork shall be thoroughly cleaned in accordance with SABS 064 of all scale, rust, grease, oil and foreign matter by shot blasting or by pickling, and then fluxed ready for galvanising.

The spelter shall have a zinc content of not less than 98 per cent and the mass of coating per 0,1 m² of surface area of the metal shall not be less than 53,4 g (0,082 mm).

The zinc coating shall be even and continuous over all surfaces including site welds, entirely free of bare spots, dull rough patches, blisters and other imperfections, shall show no signs of peeling and shall be uniform in thickness.

PO.4 PRIMING MANUFACTURED METALWORKS

Steel windows, doors, door frames and other manufactured articles where so described are to be dip or spray primed with zinc chromate primer in accordance with SABS 909 before leaving the manufacturer's works.

PO.5 STEEL WINDOWS

Steel windows and steel doors shall be in accordance with SABS 727 and in addition shall comply with the following requirements:

Side hung and vertically pivot hung sashes shall open to at least 90 degrees, horizontally pivot hung sashes to at least 80 degrees and bottom hung sashes to 30 degrees.

Sashes hung at side to open out in windows above ground floors and not accessible externally shall be hung on cleaning hinges with brass pins and washers.

Industrial type windows shall be glazed from the inside and all other windows from the outside, unless otherwise described.

Suitable weather bars shall be provided where necessary to render the windows and doors perfectly watertight.

Frames of windows and doors where fixed to concrete shall be provided with suitable lugs or screw holes for screwing to plugs at the same intervals as the standard fixing lugs.

Windows, doors and components shall, before leaving the manufacturer's works, be primed unless described as hot dip galvanised.

Windows and doors, unless otherwise specified, shall be of "one piece" construction; those which are to be in more than one unit shall be joined with standard mullion/s and/or transome/s.

After windows and doors have been built in and before glazing they are to be overhauled adjusted and left in good working order.

PO.6 PRESSED STEEL DOOR FRAMES

Pressed steel door frames shall be of approved South African manufacture, constituted of mild steel cold-rolled sheet 1,63 mm thick for single, rebated frames and 1,22 mm thick for double rebated frames. Rebate sizes to be suitable for standard timber doors 44 mm thick.

Head and jamb members to be accurately bent to form the profile. Corners to be mitred and welded and also reinforced with 1,63 mm steel angles. Transomes for fanlights to be left into the jambs and all joints welded solid. Welds to be cleaning off flush, leaving a perfect outside finish. Each frame to be provided with a pair of sturdy channel section tie bars, welded below the frame. Where required for additional strength, cross struts of the same section are to be welded between and at right angles to the main ties.

1,63 mm thick adjustable 228 mm long corrugated lugs with ends split and bent for building in are to be supplied with every frame, three to each side.

Before leaving the factory the linings are to be thoroughly cleaned free from scale, rust, grease, etc, and painted with one coat zinc-chromate primer, unless described as being hot dip galvanised. Linings are to be carefully protected in transit and during erection from twisting and dents.

PO.7 FITTINGS

Each from for single side-hung doors to be provided with the following:

- a) One pair 102 mm 5 knuckle loose pin steel hinges, with a 3-knuckle leaf welded securely onto the frame.
- b) One pair 76 mm 5 knuckle loose pin steel hinges, welded onto transoms, and suitable for a timber bottom hung fanlight.
- c) One adjustable chromium-plated strike plate with mortar guard, suitable for mortice locks of South African or British manufacture.
- d) Three rubber shock absorbers in rebate of lock jamb.

Each frame for double doors to be provided with the following:

- Two pairs 102 mm 5-knuckle loose pin steel hinges, with 3-knuckle leaf welded securely onto the frame.

All hinges to have back plates welded on as reinforcement.

All perforations for bolts, etc, are to be provided with mortar caps welded to linings and all tappings for screws shall be provided with back plates welded on behind screws and fitted with steel countersunk set screws.

PO.8 SIZES ETC

The sizes given are approximate; the widths stated are to suit normal brick and concrete walls plastered on one or both sides and the first dimension stated is the total thickness of the wall and plaster to be lined. Careful references must be made to drawings and buildings for exact sizes and details for ironmongery before ordering. Any errors in this respect will be at the Contractor's expense.

PO.9 FIXING

The fixing and building in of linings is elsewhere allowed for.

PO.10 ALUMINIUM AND ANODISED ALUMINIUM

PO.10.1 Aluminium

Extruded sections are to be of 50 STE or 50 STF alloy in accordance with BS 1474/HE 9 or of KE 45 alloy.

Aluminium sheets and strips are to be of 2SH4, or PO57S-H6 in accordance with BS 1470/SIC or 1470/POS4 respectively.

All alloys are to be anodising quality.

PO.10.2 Anodising

Where aluminium shall, unless otherwise described, be anodised for exterior exposure to a minimum thickness of 25 microns in strict accordance with grade AA 25 of BS 1615.

Anodising is to be of the colours as specified hereafter and equal to samples submitted to and approved by the Engineer. Where described as "natural" colour, anodising is to have a soft textured natural satin finish.

PO.10.3 Chrome-plating

Where described, chrome-plating is to be in accordance with BS 1224.

PO.10.4 Anodised aluminium louvre units

Adjustable glass louvered windows must comply with the Central Standardisation Committee Specification CKS 414/1974 and all suppliers of adjustable glass louvered windows must furnish proof of this compliance before acceptance of their product can be approved.

The sizes given are approximate and are not to be used for ordering purposes, but reference must be made to detail drawings for exact sizes.

Rates must include for all necessary holes, screws, packing pieces, threads and assembling and fixing in accordance with the methods employed and the materials supplied by the manufacturer's of the louvre units.

PO.10.5 Vitreous enamelled chalk boards

Vitreous enamelled chalkboards are to be formed with approved vitreous enamelled steel panels with flanged edges and non-glaring permanent olive green finish, complete with fixing lugs and vitreous enamelled or extruded aluminium chalk rail all as approved. Tenderers to submit a detailed specification.

Prices are to include for hanging panels to fixing lugs spaced at approximately 457 mm centres and for securing lugs and chalk rails to brickwork with special screws and plastic plugging compound as supplied by the manufacturer's of the panels, drilling mortices or wall plugs, rounding off front corner of each end of chalk rail to a 25 mm radius protecting from injury and cleaning down at completion, all in strict accordance with the manufacturer's instructions.

PP PLASTERING

PP.1 CEMENT, LIME AND SAND

Cement to be described under "Concrete Work". Lime to be as described under "Brickwork" and to be slaked and run at least four weeks before being used. Sand to be described under "Brickwork".

PP.2 PROPORTIONS OF CONSTITUENT PARTS OF PLASTER, RENDING, ETC

The mixes stated are proportions by volume. Water is to be accurately measured for each mix to the Engineer's approval.

PP.3 LIME PLASTER FOR WALLS

Unless otherwise described, lime plaster for one coat work is to be in the proportion of 4 parts sand to 1 part lime(4:1). For two coat work the rendering coat is to be in the same proportion and the setting coat is to be white lime putty. The plaster of paris is not to be added to the mixture until immediately before the setting coat is to be applied and then to be thoroughly incorporated in the mixture.

PP.4 CEMENT PLASTER

Unless otherwise described, cement plaster to walls is to be in the proportion of 6 parts sand to 1 part cement for (5:1) internal work and 4 parts sand to 1 part cement for external work (4:1). Cement plaster to concrete ceilings, beams, etc., is to be in the proportions of 4 parts sand to 1 part cement (4:1).

PP.5 PREPARATION FOR PLASTERING GENERALLY

Joints in brickwork are to be raked out and the surface cleaned and wetted to receive plaster or tiling. Prices for plastering or tiling on concrete are to include for hacking if necessary to form key, brushing with a wire brush thoroughly wetting and flushing up with 3:1 cement grout.

PP.6 PREPARATION FOR PLASTER TO RECEIVE MOSAIC TILING

Joints in brickwork are to be raked out and all concrete surfaces are to be roughened by chipping at approximately 150 mm centres in both directions. All surfaces are to be thoroughly cleaned of all foreign and loose material, including grease, etc. and slushed with a wet mixture of Portland cement and a well graded clean sharp river sand in the proportion of one part cement to two parts sand (2:1), thrown on vigorously, left rough and allowed to harden before receiving the plaster coat. The section of brick and concrete surfaces are to be adequately adjusted by properly wetting the surfaces of a minimum of two days before application of the slush.

PP.7 PLASTERING GENERALLY

Plaster on walls shall be not less than 10 mm nor more than 15 mm thick unless otherwise described.

Unless otherwise described, all external plaster to be finished with a wooden float and internal plaster to be finished with a steel trowel, to a smooth, straight and even surface, free from tool marks and other blemishes, and any cracks, blisters and other defects are to be cut out and made good and the whole left perfect at completion.

Rates are to include for forming plain internal angles and internal angles of ceilings covered to not more than 25 mm radius, working around nibs, rafter feet etc. and into corrugations of iron or asbestos-cement sheeting where applicable.

All mouldings, weatherings, etc are to run to detail and prices are to include for dubbing out, forming templates, runners, etc, plastering on faces of flush concrete columns and beams in brick walls has been measured as "on vertical surfaces".

PP.8 RENDERING ON CONCRETE FLOORS

PP.8.1 Code of practice

The Contractor will be required to execute the work described under this heading in accordance with the requirements of SABS 0109-1969 "Floor Finishes on Concrete".

PP.8.2 Preparation of surfaces

Concrete surfaces to receive floor renderings are to be chipped if required, thoroughly cleaned with a wire brush, well soaked with water and to have a coating of neat cement grout applied immediately before the rendering coat is applied.

PP.8.3 Cement screeds

Unless otherwise described, screeds for asphalt and vinyl-asbestos tiling, block floors, linoleum, etc are to be composed of 3 parts sand and 1 part cement (3:1) to the thickness stated and trowelled to a smooth and even surface. Where it is the intention that floor screeds of adjoining rooms or areas shall be on the same level, sufficient brickwork at skirting level is to be omitted in dividing walls to ensure that levels on both sides of such walls are precisely the same.

PP.8.4 Cement rendering

Rendering unless otherwise described is to be composed of 3 parts coarse river and to 1 part cement (3:1) brought up to a smooth hard steel trowelled surface by repeated trowellings as required.

PP.8.5 Granolithic

Granolithic unless otherwise described is to be composed 2 parts approved hard stone chippings or hard coarse sharp washed granitic or quartzite sand, graded to pass a 10mm sieve, and be retained on a 5 mm sieve, ½ part sand and 0.1 part cement (2:1/2:1) brought up to a smooth hard steel trowelled surface by repeated trowellings as required.

PP.8.6 Non-slip granolithic

Granolithic where so described, is to be treated with carborundum chips evenly distributed and rubbed into the upper surface before granolithic has set. The carborundum must be saturated with water and applied at the rate of 1,4 kg m², well rolled in or worked in with a steel trowel, all in strict accordance with the manufacturer's instructions and to the approval of the Engineer.

PP.8.7 Hardened granolithic

Granolithic where so described, is to be hardened by the addition of an approved hardening compound mixed into granolithic in the proportion of 10,5 kg per sack of cement, and in addition, dusted on with equal proportions of cement and well trowelled in (approximately 2 kg of compound per square metre of surface), all in strict accordance with the manufacturer's instructions.

PP.8.8 Generally

All granolithic work and rendering shall be done by experienced workmen, and properly protected and cured, final trowelling to be executed after the bleeding of water ceases and the finish has started to stiffen.

The work is to be laid in panels not exceeding 6 m² in area and finished with small Vjoints or as described in these Bills of Quantities.

In no circumstances will the sprinkling on of dry cement, or a dry mixture of cement and sand be permitted.

Where rendering or granolithic is described as tinted, the requisite quantity of approved colouring materials is to be mixed with the cement. No dusting on of colouring material will be allowed. In no case should over 10 per cent of pigment be added to the cement.

Rates are to include for dressing to falls where required, for forming neat sunk Vjoints to panels, protecting from injury cleaning down, and where tinted for finished with a coat of approved wax polish or stoep reviver well rubbed in at completion.

NOTE:

Mitres, etc.

Except where mitres, etc, are separately measured the prices for all slightly rounded angles, coves, V-joints, fair edges, skirtings, etc are to include for all mirrors, stops, etc.

Defects

All cracks, crazes, blows, blisters and other defects in plaster, granolithic ect, are to be made good the Engineer's approval.

PQ TILING

PQ.1 MATERIAL

PQ.1.1 Cement

Cement shall be ordinary Portland cement complying with SABS 471

PQ.1.2 Sand

Sand shall comply with SABS 1090 for the relevant types of tiling.

PQ.1.3 Glazed ceramic wall tiles

Glazed ceramic wall tiles and fittings shall comply with SABS 22.

PQ.2 PREPARATORY WORK

Surfaces shall be clean and free of oil and thoroughly wetted directly before any tiling is commences. Concrete surfaces shall be slushed with a mixture of one part cement and one part coarse sand or otherwise treated to form a proper key.

Descriptions of tiling shall be deemed to include for the necessary preparatory work. A portion of the tiling described as "on brick walls" (or Block walls) is on concrete column, beams and lintels flush with the face of the wall

PQ.3 TILING

Tiles shall be fixed in accordance with SABS 0107 and pointing shall be with waterproofed white cement. Joints shall be straight, continuous and tightly fitted.

Descriptions of tiling shall be deemed to include for all square cutting.

Descriptions of toilet paper holders, soap dishes, etc shall be deemed to include for building in and forming recesses where necessary.

PR PLUMBING AND DRAINLAYING

PR.1 DIAMETERS

All dimensions of pipes are internal diameters unless otherwise described.

PR.2 REGULATIONS

All drainage, sanitary and general plumbing work is to be executed in accordance with the Drainage and Plumbing Regulations of the appropriate Local Authorities and to the approval of the Engineer, and shall be tested throughout in accordance with the requirements of the Regulations and Engineer's instructions.

PR.3 REGISTERED PLUMBERS

Only registered plumbers are to be employed on any plumbing or drainage work in this Contract.

PR.4 GALVANISED SHEET IRON

Galvanised sheet iron shall be of the specified thickness flat mild steel (before galvanising) and coated with zinc of mass not less than 450g (Class B) per m², both sides included, unless otherwise described. All nailing and screwing shall be done with galvanised iron nails and screws. Rates are to include for clips, welted edges, riveted and soldered seams and joints, wedging and labours in dressing as required.

PR.5 SHEET IRON GUTTERS

Sheet iron gutters shall be of galvanised sheet iron of thickness specified and shall have beaded edges and all joints riveted and soldered.

Gutters shall be laid to proper falls and shall be provided with angles, stopped ends and outlet nozzles as required. Angles shall be strengthened with 50 mm wide strips of 0,60 mm thick galvanised sheet iron soldered over the internal mitres inside the gutters.

Gutters shall be fixed on brackets of galvanised mild steel, of size specified bent to shape of gutters with front end taken up to underside of beaded edge of gutter, and each twice screwed to roof timbers. Gutters shall be bolted to brackets at front with 6 mm galvanised gutter bolts, one to each bracket, and positioned close up to underside of beaded edge of gutter.

Brackets shall be spaced at not exceeding 1 m centres.

PR.6 SHEET IRON PIPES

Sheet iron rainwater pipes shall be of 0,60 mm thick galvanised sheet iron, seamed at back and jointed with slip joints neatly soldered. Pipes shall be provided with offsets, elbows and shoes as required.

The pipes shall be fixed 25 mm clear of finished wall face on galvanised mild steel rainwater pipe brackets as specified spaced at not exceeding 2,4 m apart, and having tails built into walls in 3 : 1 cement mortar.

PR.7 SHEET COPPER

Sheet copper for covering flat roofs and for valley and gutter linings, flashings, soakers, eaves gutters, rainwater pipes and the like shall be cold rolled and of halfhard temper of the specified thickness. All nailing and screwing shall be done with copper or copper alloy nails and screws. Rates are to include for clips, welted edges, riveted and soldered seams and joints, wedging and labours in dressing as required.

PR.8 SHEET LEAD

Sheet lead shall be best milled sheet of the full mass specified, and of equal thickness throughout. All nailing and screwing shall be done with copper or copper alloy nails and screws. Rates are to include for clips, welted edges, tacks, wedging and labour in dressing as required.

PR.9 FIBRE CEMENT RAINWATER GOODS

Fibre cement rainwater goods are to be of approved South African manufacture. Residential half round, O.G. and square section gutters are to be spigot and socketed with both contact ends drilled, primed with an approved sealer, coated with mastic-based compound approximately 6 mm thick, and each joint secured with one 6 x 38 mm galvanised iron verandah bolt with nut and two felt and two galvanised iron washers and steel spring washers if necessary. Industrial gutters also shall be socketed and jointed as before described but with addition of tarred hemp and with the number of 6 mm diameter bolts appropriate for the particular size of gutter.

Pipes are to be spigot and socketed and jointed with tarred hemp and water proofing compound lightly caulked in and pointed in (3 : 1) cement mortar.

PR.10 RAINWATER GOODS

UPVC gutters and downpipes shall comply with SABS 11 "Unplasticised polyvinyl chloride components for external rainwater systems".

PR.11 CONCRETE PIPES FOR STORMWATER

Concrete pipes for stormwater drainage are to be reinforced spun non-pressure S.C. type and Class B unless otherwise described in accordance with SABS 677. The piping may have self centering spigot and socket joints or be in plain lengths with loose collars, and jointed all in accordance with SABS 058, Code of Practice for Sewer and Drain Jointing. All joints are to be wiped clean inside.

PR.12 JUNCTION BOXES

At intersections of concrete stormwater drains, junction boxes are to be formed with chamber of sufficient size to take ends of pipes described and formed of cement concrete (Class 15) bottom and sides not less than 150 mm thick worked around ends of pipes and having a 75 mm thick loose precast concrete cover with at least 75 mm bearing all round.

PR.13 STAINLESS STEEL PIPES

Stainless steel water piping up to 50 mm diameter is to be of 304 grade stainless steel to B.S. 4127. Compression pipe fittings are to be of stainless steel in accordance with BSS 864.

PR.14 GALVANISED MILD STEEL PIPES

Mild steel piping to be in accordance with BSS 1387 galvanised inside and outside of medium class, unless otherwise described, with screwed and socketed joints. The joints made with red lead and hemp to cold water piping and with graphite and hemp to hot water piping and all cut ends properly reamed out to remove burrs.

Fittings to pipes to be galvanised malleable cast iron fittings in accordance with SABS Specification 509.

PR.15 COPPER PIPES

Copper piping to be in accordance with SABS 460 Class 2 for fixing to walls, soffits, etc, and SABS 460 Class 3 for piping buried under ground. Pipes are to be bent in a proper tube bending machine. Compression pipe fittings are to be brass and of the expanded tube and cone type and coupling nuts and rotary sleeve pieces and of approved manufacture. Tenderers to submit specification.

PR.16 LEAD PIPES AND TRAPS

Lead Pipes and traps are all to be hydraulic drawn, of equal substance and full bore throughout. All soldered joints are to be wiped and brass unions must be used for jointing lead to iron.

PR.17 FIBRE CEMENT PRESSURE PIPES

Fibre cement pressure pipes shall comply with the requirements of SABS 286 and shall be of the classes herein specified and shall be provided with bends, tees, crosses, reducers and other fittings as may be required which in the case of cast iron shall comply with the requirements of SABS 546.

Fibre cement pressure pipes and fittings shall be jointed together by means of either:

- (a) cast iron short collar detachable couplings, each comprising, centre collar, rubber ring on each side of collar, and outer flange rings clamped against the rubber rings with bolts evenly tightened,

or

- (b) fibre cement collars fitted over the ends of pipes and each grooved for internally and fitted with rubber centre spacer ring and two rubber gaskets,

or

- (c) with two rubber gaskets only. The gaskets shall have holes all round on the water pressure side which will serve to expand the gaskets hydraulically by the water pressure in the pipes, and pipes shall be machine turned at ends to ensure proper fit between gaskets and pipes.

Cast iron bends, or fibre cement pressure bends conforming in all respects to the straight fibre cement pipes, shall be used at all changes of direction or grade in pipe lines where such changes exceed the angle of deflection permitted in the pipe couplings.

Branch connections 50 mm and less in diameter may be made at joints between pipes by the use of cast iron couplings described in (a) above, but of the long collar type and drilled and tapped for the connections, and branch connections 40 mm and less in diameter may be made in the pipes with saddle piece supplied by the manufacturer of pipes, bolted round the pipes and with pipes drilled and boss of each saddle piece drilled and tapped for the connection and positioned over the hole in the pipe with rubber washer between the boss and the pipe.

The manufacturer's instructions regarding the laying and jointing of fibre cement pressure pipes, including amount of expansion gap to be allowed between ends of pipes in cases where centre spacer ring is not provided, and maximum angular deflection that may be made in a pipe joint, shall be followed in all cases.

PR.18 UPVC WASTE AND VENT PIPES

uPVC waste and vent pipes and fittings are to be of unplasticised uPVC in accordance with SABS 967 and are to be jointed with solvent welded joints.

PR.19 CAST IRON PIPES

Cast iron pipes and fittings to be in accordance with SABS 746 and shall be made with a suitable grade of pig iron with a mixture of clean scrap iron and castings, shall be dark grey on fracture, easily drilled, tapped and filed of approved manufacture, stamped with a trade mark or manufacturer's name and coated inside and out with approved bituminous preservative solution. Pipes must be accurately laid or fixed and closely fitted together and jointed with gaskin and caulked with blue lead.

All bends and other fittings are to be of the same thickness as pipes.

PR.20 FIXING OF PIPES

Galvanised steel pipes are to be fixed to brickwork or concrete with approved galvanised malleable iron holderbats fastened with set screws and with spike cut and pinned or built in (3 : 1) cement mortar, and to roof and other timbers with stout galvanised iron saddle pipe clips screwed on.

Copper pipes are to be fixed to brickwork or concrete with bronze holderbats fastened with brass set screws and with spike cut and pinned or built in (3 : 1) cement mortar, and to roof and other timbers with stout copper clips, brass screwed on.

Lead pipes are to be fixed to brickwork or concrete with cast lead tacks or lugs soldered onto the pipes at not more than 1,3 m centres and fixed to plugs with screws and washers.

uPVC Pipes are to be fixed with approved uPVC pipe clips spaced at not exceeding 1,25 m centres to vertical piping and not exceeding 0.75 m centres to horizontal piping.

Cast iron pipes are to be fixed 40 mm clear of finished brickwork or concrete with cast iron hinged holderbats cut and pinned in (3 : 1) cement mortar and fastened with brass pins or bolts, and to roof and other timbers with suitable bolts through ears cast on to pipes.

Where mild steel or cast iron pipes are to be fixed to soffits or concrete slabs, they shall be slung to falls on 6 x 32 mm galvanised mild steel straps secured around pipes with 6 mm diameter galvanised steel bolts and nuts and with upper end built in, cut and pinned in cement mortar or suitably bolted to concrete.

PR.21 STOP COCKS, BIB COCKS ETC

Unless otherwise described, stop cocks, bib cocks, pillar cocks, etc, are to be brass screw down type of approved manufacture in accordance with SABS 226 and are to be screw jointed to iron pipes with red lead and hemp.

PR.22 BALL VALVES

Ball Valves shall comply with the requirements of SABS 752.

PR.23 SLUICE VALVES

Cast iron sluice valves shall comply with the requirements of SABS 664.

PR.24 PRESSURE GAUGES

Pressure gauges are to be 76 mm diameter with gauge cocks and they are to have full scale reading of 10 bar or 100 metres water gauge. They shall, if required, be fitted in positions shown on the drawings.

PR.25 FIRE FIGHTING EQUIPMENT

Fire Hose Reels:

Non-swinging rotary first-aid fire hose reels to be in accordance with SABS 543 and with solid side discs, 25 mm diameter waterway at bracket, incorporating rotary pressure joint to hose connection at hub, 25 mm screwed malleable iron Saunders Type "A" valve with "S" grade diaphragm and complete with all necessary fixing brackets, etc.

PR.26 FIRE HYDRANTS

Fire hydrants shall be of the wheel valve pattern with instantaneous coupling outlets, size 63,5 mm or 70 mm as described. Hydrants fixed in a horizontal position shall have oblique angle outlets and those fixed in a vertical or inclined position shall have right angle outlets.

The materials used in the manufacture of the hydrants shall be as laid down for the manufacture of couplings, branches, pipes, etc, in SABS 544 and the various requirements of instantaneous couplings, and dimensions of 63,5 mm outlets, shall be as laid down therein; dimensions for 70 mm outlets shall comply with the requirements for Morris instantaneous pattern couplings.

PR.27 SANITARY FITTINGS

All sanitary fittings to be approved by the Engineer before fixing. The Engineer will instruct that all sanitary fittings are to be properly pasted and covered with paper until the building is ready for handing over. The Contractor will under no circumstances whatsoever be allowed the use of various fittings and no fittings are to be finally connected up until the whole of the sanitary system is in position when the jointed up will be authorised.

PR.28 SOIL DRAINAGE

PR.28.1 Glazed Earthenware Pipes

All salt-glazed earthenware drain and sewer pipes and fittings are to be in accordance with SABS 559. The pipes are to be laid with rigid joints and unless otherwise described all in accordance with SABS 058, Code of Practice for Sewer and Drain Jointing. All joints are to be wiped clean inside.

PR.28.2 uPVC Drain Pipes

Unplasticised polyvinyl chloride sewer and drain pipes and fittings shall comply with the requirements of SABS 791 and installed in accordance With SABS 01121971 Code of Practice for "The Installation of Polythelene and Unplasticised UPVC Pipes".

PR.29 DRAIN TRENCHES

The bottoms of trenches are to be well rammed and finished to even falls. The Contractor shall provide all necessary sight rails, boning rods, etc. The bottom of the trenches shall be excavated to even falls and the barrels of the pipes shall rest on solid ground and holes of sufficient size shall be cut around joints to enable the jointing and filleting to be properly performed. Any excavation taken out too deep shall be made up with cement concrete at the Contractor's expense. Fill in any soft and loose places in the trenches and uneven bottoming in rock cutting with similar cement concrete.

PR.29.1 Filling

Carefully fill in and pack with soil free from any rock around and 600 mm above pipes. The trenches are to be filled in layers to such depths as directed and are not to be rammed until the pipes have been covered to a depth of 600 mm. Fill in and ram the trenches to ground level.

PR.29.2 Inspection Chambers - Soil Drainage

Inspection chambers are to be formed by excavating to the required depth in pickable material, and to be constructed of one brick wall of extra hard burnt bricks in (3 : 1) cement mortar on a 150 mm thick cement concrete bottom projecting 114 mm beyond walls all round with the sides rendered internally in (4 : 1) cement plaster finished smooth, and the bottom steeply benched up with cement concrete brought up vertically at sides of channels to level with tops of main drains and then steeply sloped up to walls of chamber and finished smooth with (3 : 1) cement render. The top of chamber to be fitted with cast iron manhole cover as later described with frame of cover bedded in 76 mm thick cement concrete surround, splayed on top and finished with (3 : 1) untinted cement render steel trowelled and with angles rounded. Where necessary the sides of chambers are to be corbelled over in maximum 75 mm steps per course of brickwork or may be constructed with a 102 mm cement concrete (Class 20) properly reinforced slab bearing full width on all walls and rebated for manhole cover and frame.

Inspection chambers exceeding 1,8 m deep are to have a lower chamber of a minimum size 1060 mm x 760 mm internally and with a 150 mm reinforced cement concrete (Class 20) slab over and continued up the remaining height with a 610 x 450 mm shaft, not exceeding 750 mm high.

PR.29.3 French Drains

French Drains are to be 600 mm wide of length and depth below drain inlet specified with rubble walling of large stones laid dry to form a cavity under inlet size 300 x 300 mm from bottom of trench to 50 mm above inlet pipe and cover with and including flagstone or cast cement concrete slab size 800 x 600 x 75 mm thick, and with bottom to falls and fill in up to invert level of drain with clean, hard, broken stone or clinker graded to sizes rejected by 38 mm ring and passed by a 75 mm ring and with a distribution drain 300 mm from bottom formed with 100 mm diameter socketed or plain stoneware pipes laid with loose dry joints or 12 mm wide open joints respectively to same fall as bottom of trench and cover with approved bituminous sheeting laid over the stone filling and lapped 75 mm at joints and fill in over with clean earth to ground level, lightly ram and level off and remove, deposit and level surplus earth on site where directed.

PR.29.4 Soakage Pits

Soakage pits to be size 2 m x 2 m or as described and depth specified below drain inlet with rubble walling of large stones laid dry to form cavity under inlet size 300 x 300 mm from bottom of pit to 50 mm above inlet pipe and cover with flagstone or cast cement concrete slab size 300 x 600 x 75 mm thick, fill in remainder of pit to invert level of drain pipe with clean hard broken stone or clinker too sizes rejected by a 38 mm ring and passed by a 75 mm ring, well graded, cover with approved bituminous sheeting lapped 75 mm at joints and fill in over with clean earth to ground level, lightly ram and level off and remove, deposit and level surplus earth on side where directed.

PR.29.5 Concrete Casing to Pipes

Concrete casing to drain pipes to be cement concrete (Class 15) of a minimum thickness equivalent to the diameter of the drain pipe and to include for casings, etc.

PR.29.6 Rates for Drains and Pipes in Ground

Rate for all pipes described as in ground are to include for excavating in pickable material to the depths stated, laying to even falls, handholes, allowing for risk of collapse of the sides of excavations and filling in and ramming. All pipe laying is to be carried out in accordance with the procedure described in SABS 058.

PR.29.7 Rates for Piping

The rates for all stoneware, concrete, cast iron, black iron, galvanised mild steel and copper pipes are to be included for all short lengths, cutting and jointing as described. The prices for copper, black iron and galvanised mild steel pipes are to include for plain sockets in the length to the pipes of all diameters.

PR.29.8 Keep Excavations Free from Water

The Contractor shall be responsible for keeping all excavations free from water by baling, pumping or otherwise and he must allow accordingly in his rates.

PR.29.9 Planking and Strutting

The Contractor shall be responsible for performing all planking and strutting and shoring that may be necessary to maintain excavated faces and to ensure the safety of the works at all times. He shall accept full responsibility in this connection and must allow in his rates accordingly.

PR.30 DESCRIPTIONS AND PREAMBLES

The Contractor is referred to the previous trade headings for preambles and full descriptions of materials and items not described in this trade.

PS GLAZING

PS.1 GLASS

All clear glass unless otherwise specified is to be of South African Manufacture, "Ordinary Quality" of the various masses and/or thicknesses mentioned, free from bubbles, scratches and other imperfections, and to be cut in panes to suit all glazed openings as required.

All obscured glass to be of type specified and to be free of devitrification, scratches and other imperfections, and must be left perfectly clean on completion. All glass broken before handing over the premises for occupation is to be replaced and surfaces made good by the Contractor.

Polished plate glass for glazing shall be transparent polished plate glass or approved Float Glass of "GG" quality and of the thickness stated. Glass for mirrors shall be of polished plate glass as described but specially selected.

Glazing sizes and thicknesses for sheet glass and plate/float glass shall be in accordance with Tables and 1 and 2 of SABS 0137 - 1978.

PS.2 GLAZING

Glazing generally shall be executed in accordance with SABS 0137 - 1978 Code of Practice for the Glazing and Fixing of Glass in Buildings" in particular the following aspects.

Putty for glazing shall comply with the requirements of SABS 680, of Type 1 for glazing in wood and of Type 2 for glazing in steel windows, doors, etc. Putty used for glazing in varnished, oiled or other natural colour finished wood shall be tinted to match the colour of the wood.

Glass fixed with glazing beads in unpainted hardwood doors shall be bedded on strips of rubber, expanded neoprene, expanded polyethylene or ribbon velvet, turned over on both sides of glass in the rebates to form a soft packing between the glass and the woodwork. In all cases the glass shall be well bedded in back putty in the rebates. Rebates for glass, other than in unpainted hardwood doors, or non-ferrous metals shall be primed before glazing.

The glazing contractor shall where required use an approved mastic type glazing compound, for glazing all aluminium windows. The glazing compound shall have a composition particularly adapted for use with aluminium windows and the methacrylate lacquer with which the windows are coated shall not require painting to protect it from drying out or deterioration.

Glass panes exceeding 0,4 m² in surface area and fixed with putty only in wood doors, sashes and the like shall be secured in addition with glazing sprigs, and in steel windows and doors with glazing pegs or clips inserted in holes in the steel framing.

Prices for glazing of laminated safety glasses are to include for glazing strictly in accordance with the manufacturer's instructions with non-hardening glazing compounds of approved tints and suitable for use with the fabric of the sashes, together with all necessary neoprene setting, spacing and location blocks. The glazing compound must carry the manufacturer's warranty that it is compatible with laminated glass and that it contains no deleterious ingredient which may chemically affect or physically dissolve the vinyl butyryl interlayer of the laminated glass.

Glass panes shall have adequate glazing clearance between the edges of the glass and the rebates.

Putty shall be carefully trimmed and cleaned off with front putty worked to within 2 mm of the sight lines.

All soft or oily putty is to be replaced and all putty is to form a surface crust and have a smooth finish before any paints are applied.

PU PAINTING

All paints, oil stains, varnish, linseed oil, knotting driers, distempers, etc, are to be in accordance with the latest SABS Specification where applicable or of the quality, type and brand and manufacture specified and/or approved by the Engineer. All materials for paint work must be brought on to the site in unopened tins or drums. Unless specifically instructed by the directions or sanctioned by the Engineer, no paints are to be thinned or otherwise adulterated, but are to be used as supplied by manufacturers and direct from tins. Mixing of different coloured paints to obtain special tints may only be done with the sanction of the Engineer.

Where special brands of paints are to be used, the manufacturer's "priming" and all subsequent coats of paint suitable for that particular brand are to be employed, all in accordance with manufacturer's instructions. Wherever possible all paints used in this contract are to be manufactured by a member of the SA Paint Manufacturers Association.

In all cases Test Standards are to be set up under the supervision of the Manufacturer's Representative and such standard of finish maintained throughout the relative work to the full satisfaction of the Engineer. Where for any reason the Test Standard required cannot be achieved, information concerning this should be sought from the Manufacturer's Representative for requisite action. Any extra cost to be considered by the Engineer, on the basis of responsibility of issuing a variation order.

All colours and tints used throughout the work are to be selected and/or approved by the Engineer before painting of any description is commenced. Each coat of paint is to be a distinctive colour.

PU.1 PREPARATORY WORK

PU.1.1 Generally

All plaster, metal, wood or other surfaces which are to receive finishes of paint, lacquer, stain, oil distemper, lime wash or paint work of any other description are to be carefully inspected by the Contractor, or his principal painter, who must satisfy himself that such surfaces are in a fit state to take the paint work specified, before he allows any of this painters to commence the work. The Contractor, will be held solely responsible for all defective work condemned as a result of the Painter's failure to insist on receiving from the other trades, surfaces in the proper condition to allow first class finishes of the various kinds specified being applied to them.

Prior to commencing paint work of any description and before each coat is applied, surfaces are to be thoroughly dry and are to be rubbed down.

PU.1.2 On plaster, bagging, etc

All plaster work, etc, to be painted must be thoroughly brushed down to remove all traces of efflorescence, filled where necessary with suitable stopping or patching plaster and left perfectly dry and smooth.

PU.1.3 On metal

All metal to be painted shall be scraped and cleaned of all dust, rust and other surface incrustations shall be removed and surfaces left smooth. Also all oil and grease shall be removed and perfectly clean surface obtained.

PU.1.4 On wood

All wooden surfaces to be painted shall be properly knotted with best quality knotting, stopped after priming and rubbed down with glass paper. All wooden surfaces to be varnished, stained or oiled only, must have all plaster stains, pencil marks and other surface discolourations and blemishes removed, and must be stopped with tinted stopping to match final stain colour and be rubbed down to a smooth and perfectly clean surface with glass paper. All wooden floor surfaces are to be cleaned and smoothed off with a sandpapering machine before presentation to the Painter for finishing, and he must take all precautions to protect same against damage or discolouration prior to application and during drying of stain and/or oil finishes specified and until final protective wax polish is applied and properly rubbed in.

PU.2 MATERIALS AND APPLICATION

PU.2.1 On plaster, bagging, etc

Unless otherwise described, paint is to be carried into all recesses, reveals, cills, soffits, etc, and around all breaks, projections, etc, occurring within the height specified to be painted.

PU.2.2 Line wash

To be a prepared lime wash powder of South African manufacture mixed with water in accordance with the manufacturer's instructions, or a pre-mixed liquid brand approved by the Engineer.

PU.2.3 Colour wash

Is to be as last and tinted with yellow ochre to bring to a light cream colour.

PU.2.4 Distemper

Prepare as previously prescribed and twice distemper where specified with powder distemper in accordance with SABS 322 and mixed in accordance with the manufacturer's instructions.

PU.2.5 Emulsion paints, internally

Prepare as previously described and one preparatory coat of an approved filler/sealer mixed with the finishing paint in the proportion recommended by the manufacturer and two coats emulsion paint for interior use in accordance with SABS 633 (Grade 1) applied in strict accordance with the manufacturer's instructions.

PU.2.6 Emulsion paints, externally

Prepare as previously described and three coats emulsion paint for exterior use in accordance with SABS 634 (Grade 1) (synthetic polymer base type) applied in strict accordance with the manufacturer's instructions.

PU.2.7 Gloss, flat or eggshell oil paints and high gloss enamel paints

Prepare as previously described, seal with one coat of alkali resisting primer and two undercoats in accordance with SABS 681 (Type 2) and one finishing coat of approved gloss, flat or eggshell oil paint or high gloss enamel paint in accordance with the relative SABS specification, applied in strict accordance with the manufacturer's instructions.

PU.2.8 On metalwork

Prepare as previously described, prime with zinc chromate primer in accordance with SABS 679 (Type 1) followed by the number of undercoats and finishing coats later described.

Galvanised iron and aluminium surfaces are to be pre-treated with a wash primer (Metal etch primer) in accordance with SABS 723 followed by a second primer, and the number of undercoats and finishing coats later described.

Decorative high gloss enamel paint for interior and exterior use is to be in accordance with SABS 630 (Type 1).

PU.2.9 On woodwork

Priming to wood surfaces to be executed with primers in accordance with SABS 678 (Type 1) for exterior work and (Type 3) for interior work. The number and type of undercoats and finishing coats to be as later described.

Decorative high gloss enamel paint for interior and exterior use is to be in accordance with SABS 630 (Type 1).

PU.3 GENERAL

PU.3.1 Making good

All damaged paint work is to be touched up or redone. All painter spots, stains, etc, are to be removed from the floors, walls, doors, windows, etc, and the whole left perfect.

PU.3.2 Mixing paints

The Contractor will not be permitted under any circumstances to prepare or mix paints or similar materials on floors where the finishings are laid complete, and such rooms must not be used as workshops for any trades whatsoever. This clause will be strictly enforced and any damage done in neglect of this precaution will have to be borne by the Contractor to the extent of completely relaying the floor finish where damaged in any rooms or room. Merely cleaning up will not be acceptable.

PV LANDSCAPING AND GRASSING

PV.1 FERTILISER

The fertiliser used shall be one or more of the following types as determined by actual tests of the soil in which the grass or plants are to be planted:

- a) Lime
- b) Superphosphate
- c) Limestone Ammonium Nitrate

PV.2 GRASS CUTTINGS

Grass cuttings (springs) shall be of kikuyu or an approved type of local kweek.

PV.3 GRASS SEED FOR HYDROSEEDING

The grass seed shall comply with the requirements of the Government Seed Act No 20 or 1961.

PV.4 TOPSOIL

Topsoil shall consist of fertile, friable soil of loamy character and the areas from which it has been removed shall have been covered by natural vegetation normal to the region. Topsoil shall not be taken from swampy area unless authorised by the Engineer. Topsoil shall be obtained wherever suitable material exists, either in the road reserve from areas where cuts and fills are to be constructed, or at borrow pits from areas to be cleared. Suitable topsoil shall be stockpiled when clearing is done for construction of the formation or borrow pits and during construction of the formation.

The Engineer shall indicate where topsoil is to be removed. If the Contractor fails to stockpile the topsoil indicated, he shall obtain suitable topsoil from other sources when such topsoil is required, in which case no payment for overhaul or stockpiling shall be made.

In the event that not enough suitable topsoil is obtainable from the above mentioned areas, the Contractor shall obtain topsoil from other sources located by the Engineer.

1. GENERAL

In this Part, the term "Contractor" means the person, firm or company whose tender has been accepted for the work specified in the document of which it forms a part.

2. STANDARD SPECIFICATIONS

All materials and apparatus shall conform to the relevant SABS specifications or British Standard Specifications (if such exist) and interchange ability of similar apparatus is required.

All installation work shall comply with the Code of Practice for the Wiring of Premises, SANS 10142, as amended. The installation shall further comply to the SANS 10400 National Building Regulation.

3. CONTRACT MATERIALS

All contract materials and equipment shall be new and the best of their kind. They shall be protected from damage before, during and after installation. Any damaged, flawed or defaced materials shall be rejected and replaced.

Where makers or catalogue numbers are specified without alternative, no alternative is acceptable: where alternatives are listed; only the named alternatives are acceptable. The phrase "similar and equal to ..." requires that the equipment offered must be closely similar in physical appearance and at least equal in characteristics and performance to the equipment specified: the offer of equipment inferior in either respect will serve to disqualify a tender. Divergences from specified equipment due to non-availability or the like shall be noted by tenderers in the Schedule of Proposed deviations.

4. WORKMANSHIP

All workmanship shall be of the best and shall follow the best modern practice with a good "finish" on all visible parts of the installation. All equipment shall be levelled, aligned, and plumbed. All work shall be done by, or under, the direct supervision of a skilled, qualified artisan. Any sub-standard workmanship condemned by the Consulting Engineer shall be dismantled and replaced.

5. DELIVERY AND COMPLETION

All contract materials and equipment shall be ordered timeously and delivered to site at dates suited to the agreed construction programme.

The successful tenderer for the installation will be required to commence work immediately following notification of tender acceptance and shall thereafter at all times maintain the progress required by the agreed completion programme.

6. FIXINGS AND SUPPORTS

Fixings to concrete and brickwork shall be by means of bolts grouted into the structure or by means of expanding bolts. The necessary holes shall be made by means of carbide-tipped "masonry" drills: percussion drilling is unacceptable. Fixings to brickwork shall be into solid brick and not into joints. Plugs or inserts of wood are not acceptable.

Fixings to steelwork shall be by means of bolts and nuts through steelwork or by bolts in tapped holes in the steel. "Caddy" proprietary fixings are acceptable if specifically suited to the duty involved.

Fixing into hollow tiles and the like shall be by means of "Butterfly" or "Toggie" bolts; the holes shall be formed by means of "masonry" drills.

Power-driven "shot" bolts are not acceptable.

7. CHASING AND CUTTING

Whenever possible, arrangements shall be made with the Principal Contractor for building in the conduits, etc., of a flush installation. If this is not possible all chasing and cutting shall be done under this contract.

All chasing and cutting shall be done with properly sharpened tools, with the minimum possible damage to the building: Power-driven cutting tools shall be used wherever possible. No cutting or chasing shall be done without the express permission of the Architect or the Structural Engineer in charge of the project.

The Principal Contractor will make good all plaster and brickwork damaged in the course of normal chasing and cutting. However, any additional plaster work or making good which has to be carried out due to the Electrical Contractor's inefficient or late installation of conduit, switch boxes, plug boxes or other equipment, will be carried out at the Electrical Contractor's expense.

8. LEVELLING AND PLUMBING

All equipment shall be carefully levelled and plumbed, checked with a spirit level. Should any equipment be unsatisfactorily installed in this respect it shall be dismantled and reinstalled. The costs of making good to damaged structures, plaster and paintwork shall be deducted from the moneys due to the successful tenderer.

It must be noted that boxes for imported accessories must be levelled and plumbed when installed, since the inserts cannot be levelled independently of the boxes.

9. DEFINITION

In this Part, the term "Contractor" means the person, firm or company whose tender has been accepted for the work specified in the document of which it forms a part.

10. ELECTRICAL SUPPLY AND PHASE ROTATION

The electrical power supply details relative to fault levels, voltage and phase rotation are given elsewhere in this Specification.

The phase rotation specified shall be maintained on all overhead lines, cables, transformers, and switchgear and distribution equipment. Where existing connections are to be reconnected to a new system, the phase rotation is to be checked before disconnection and the reconnection made to maintain the same phase rotation.

11. SWITCHING OF POWER SUPPLIES

Any switching of existing power supplies shall be pre-arranged with the appropriate Authority. All possible preparation shall be made in advance, to minimize the time required for re-energizing the system. All such switching shall be carried out by the "responsible person" unless such authority is given to the Contractor by that person, in writing.

12. EARTHING AND BONDING

12.1 Resistance Values

While every effort should be made to obtain an earth resistance value of 1,0 ohm or less, the maximum values of earth electrode resistance acceptable, unless stated to the contrary elsewhere in this specification, are 10 ohm at any minibus or transformer, 15 ohms at any indoor or outdoor switchboard or HV gang links and 20 ohms at cradle earthing points, lightning arresters or other pole mounted equipment. In the case of the earthing of LV feeder and overhead line neutrals the combined resistance to earth of all systems shall not exceed 10 ohms.

Transformer neutral earthing shall comply with the sub-Clause "Transformer Earthing" below.

12.2 Main Substation Earth System

Where this system is not detailed elsewhere in this Specification, it shall comply with the sub-Clause "Earth Systems" elsewhere herein, two separate systems being installed and linked independently to the earth bar.

The main earth bar shall consist of an adequate length of minimum 50mm x 6,3mm tinned copper bar. It shall be supported by means of cycloaliphatic resin insulators in a suitable position on a wall or plinth and shall be readily accessible for inspection. Conductors connecting equipment to it shall be 70mm² copper terminated in compression type lugs. The size of earth bar and number of earth conductors shall depend upon the prospective short circuit current of the system. All connections shall be suitably labelled.

12.3 General Earth Systems

Unless otherwise specified elsewhere in this Specification, the earth systems for distribution transformers, mini subs and ground or pole mounted switchgear, lightning arresters, etc. shall generally comprise two earth electrodes with 1,5m long earth spikes located 6,0m apart, linked with 70mm bare conductor. They are to be located adjacent to pole structures or ends of plinths in the case of mini subs and shall be located at least 1,0m there from.

In the case of transformer earthing, if the neutral earth system resistance is not 1,0 ohm or less, two systems as above are to be installed, one for the LV neutral and the other for the tank and associated equipment in which case they are to be kept at least 6,0m apart and at opposite sides of the transformer position.

The earth system is to be connected with 70mm² insulated earth conductor to the earth bar or transformer tank earth stud as appropriate.

Immediately after installation and before livening up the equipment the Contractor shall test the earth resistance of the earth system, using the respective earth bar or termination as the reference point. If the required value is not obtained, each earth spike, if installed in a sidewalk, shall be increased in length by driving a further length of 1,5m but where located in open ground, two additional spikes are to be installed. These latter spikes are to be perpendicular to the original two, in line with the spike at the point of connection of the insulated earth conductor and each 6,0m there from. After installing the additional spikes, the earth resistance shall again be determined. The Contractor shall submit a report in duplicate confirming the values measured, including the first set if appropriate, to the Engineer.

Where the number of spikes called for does not achieve the required values, the Engineer is to be advised and will give further instructions for the improvement of the values obtained. Where more spikes are necessary to obtain the required value, these shall not be installed within 6,0m of any other spike.

The common leg of the secondary's of CT's, other than the secondary's of summation transformers, shall be effectively earthed to the main earth system.

12.4 Reticulation Feeder Neutral Earthing

At kiosks and fused feeder pillars a 30m length of bare earth conductor of half the size of the phase conductors but not greater than 70mm² shall be laid from each kiosk earth bar towards the source of supply. The neutral bar shall be connected to the earth bar with green insulated conductor of the equivalent size.

At various points not exceeding 150m apart along the length of overhead lines and at tee connections and the ends thereof as indicated on the drawings, the neutral conductor shall be bonded to an earthing point which shall comprise a 1,5m long earth spike. The insulated earth conductor shall be carried in a galvanised sleeve from 500mm below ground to 3,0m above. The connection of the earth conductor to the line conductor shall be made with a connector suitable for the particular line conductor material.

12.5 Earthing of Pole-mounted Equipment

Pole mounted transformers shall be provided with an earth system as described above. The insulated earth connections shall be taken up the pole in a section of galvanised conduit extending at least 500mm below ground level and to a height of 3,0m above.

At cradle earthing points, reclosers, or sets of lightning arresters, one 1,5m long earth spike shall be provided, the insulated earth connection being enclosed in galvanised conduit as described above.

12.6 Operator's Platform

A 1,0m x 1,0m HDG operator's platform complying with the detail shown on the drawing annexed to this Specification is to be installed at each gang-link isolator, unless otherwise indicated in this Specification. The platform is to be erected 150mm above ground level, the legs being cast into mass concrete generally complying with the Clause "Plinths" elsewhere in this Part.

The platform is to be connected "by means of two 40mm" bare earth conductors to an earth system as described above.

A separate 50mm² bare earth conductor is to be used to bond the isolator steelwork to the platform. The steelwork ABOVE the insulated section of the operating rod is not to be bonded.

Where a steel plate in lieu of a platform is specified elsewhere in this Specification, this shall comprise a hot dip galvanised steel plate of 1,0m x 1,0m x 6,0mm steel located at the operating handle position. This plate is to be bonded to the earth system and to the isolator steelwork using two 50mm² earth conductors connected to separate points.

12.7 Earth Spikes

Earth spikes shall comprise 16mm sectional steel core rods with a minimum of 0,25mm pure copper coating molecularly bonded thereto, complying with SABS 1063, and of "Cadweld" or equivalent manufacture. The top of earth spikes and the interconnecting conductors are to be 1,0m below finished ground level.

Under no circumstances are earth spikes to be located closer than 1,0m to any structure or plinth nor are they to be installed in pole holes.

The connections to earth spikes shall be by means of at least two phosphor bronze mechanical clamps of an approved type for this duty, or a "Cadweld" joint. The clamps shall not be attached to the rod but must be installed so that the bolt face is in contact with the rod. Brazing will not be accepted. The connection must be wrapped with two layers of "Denzo" tape. "

A cable marker as described elsewhere in this Part shall be installed above each spike and shall be labelled "Earth Spike".

12.8 Earth Continuity Conductors

Earth conductors shall be hard drawn bare copper wire complying with SABS 182 or bi-coloured green/yellow PVC covered, the PVC being UV stabilised complying with SABS 1411 Part 2, as elsewhere specified herein.

The conductor sizes shall be such that they can carry the short circuit current likely to be imposed upon them but generally shall be half the area of the phase conductors with a maximum size of 70mm² or in accordance with the appropriate Regulations, unless specific sizes are given elsewhere in this Specification. 50mm² conductors shall be 7/2, 65 HD.

Bare earth continuity conductors shall be run with all cables constituting a low voltage distribution system except in the case of township reticulation where an earth system as described in the sub-Clause "Neutral Earthing" above shall be installed at kiosks, etc.

A single conductor may be used where two or more cables run together, provided that the conductor cross-sectional area is based on the largest size cable in the run, and that branch earth wires are solidly connected to the main earth conductor using only "Cadweld" connections. Earth continuity conductors shall be connected to main earth bars.

Bare earth conductors shall not be less than 500mm below ground level. Above this level all earth conductors shall be green insulated carried in a PVC conduit sleeve except where galvanised conduit is specified elsewhere herein.

A terminal lug shall be crimped onto the end of the main earth conductor for bolting to the main earth bar of a substation or mini-sub or other outdoor equipment. Two mechanical clamps shall be used for connection onto cradles or other equipment, as appropriate.

Earth connections shall be so made that in the event of any connections being removed the earth connection to the rest of the equipment will not be affected.

12.9 Bonding Generally

All metallic parts of the installation are to be bonded to the earth system as required by the appropriate Regulations.

All iron roofs, gutters, down pipes water and waste pipes, as well as all steel structures, are to be bonded to earth. The maximum resistance of any such point to the earthed end of the earthing lead shall not exceed 0.2 ohm.

12.10 Bonding of Equipment

Where equipment is bolted together, as in the case of an HV or LV switchgear panel, there is to be a 32mm x 4mm copper earth strap extending the whole length of the equipment. All earth bars shall be run in one continuous length as far as possible and shall not be bent or formed in any way that requires hammering or severe distortion. Any joints shall be lapped with at least two bolts with nuts and washers of suitable size. The lapped ends shall be pre-tinned. If multiple straps are used, they shall be bolted and fixed together at not more than 75mm intervals. All connections shall be made using brass or stainless steel bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels, mini subs and outdoor equipment. Connections to indoor equipment may be made with cadmium plated steel bolts, nuts and washers, with a steel spring washer.

All steelwork on a pole is to be bonded using 25mm² solid copper conductor. This requirement applies to cross-arms, all insulator supports and any other hardware.

Where equipment is also mounted on the pole, the bonded metal is to be earthed to an earth spike as elsewhere specified herein, using a 50mm² bare copper conductor.

12.11 Bonding of Steel Lighting Poles

Steel streetlight and site lighting poles shall be bonded with a continuous earth continuity conductor of half the area of the phase conductor, but a minimum size of 4mm², laid with the cables. This conductor shall be connected to the pole earth stud. At the last pole in a run the neutral conductor shall be bonded to earth.

12.12 Supplementary Requirements for Building Services

The main earth system is to comply with the Supply Authority's requirements. Earth spikes, mats and conductors shall be installed as early as possible in the building program, and the onus is on the Contractor to arrange this with the Building Contractors to avoid later disturbance of completed construction. Before proceeding, however, the attention of the Engineer is to be drawn to the exact proposals and approval obtained.

Bare earth conductors complying with the requirements of the Wiring Code shall, unless otherwise specified elsewhere in this Specification, be drawn into conduits together with the current carrying conductors, between all main, sub-main and sub-distribution boards.

Ends of earth conductors shall be terminated in lugs securely bolted to switchboard frames or trays.

Unless otherwise specified elsewhere in this Specification, bare copper earth wires complying with the Wiring Code shall be run with all socket outlet, water heater, stove and other power outlets. Bare earth wires shall also be run in all ceiling and skirting trunking to bond all light fittings, socket outlets and the trucking lengths themselves. Such conductors shall also be run in all non-metallic conduits. In aluminium trucking, the earth wire shall be insulated with green PVC.

Earth conductors run outside flexible tubing, where this has been permitted, shall be run neatly along the tubing, and shall be held in place by approved cable ties. Such conductors shall not be wound around the tubing.

13. MINIATURE SUB-STATIONS

13.1 General

The units to be provided under this Contract shall comply with SABS 1029 & 1030 and shall all be of the same manufacture.

Overall dimensions are to be the same as far as possible and the height shall not exceed 1,5m. The colour of the units shall be in accordance with SABS 1029 unless otherwise specified.

Each unit shall be of steel construction with plate thickness not less than 2,5mm except that if a fully galvanised unit is offered, the plate thickness shall not be less than 3,0mm. The top canopy shall have vertical sides and shall be removable. The unit shall be mounted on a 6,0mm hot dip galvanised steel channel underbase for bolting down onto a concrete plinth.

The HV compartment enclosure shall be easily removable without having to disturb the equipment. The transformer shall be readily removable and replaceable by a similar transformer of any standard rating up to 400 kVA.

The HV compartment shall be provided with hinged front access doors and hinged side access panel measuring 600mm x 600mm with levered latching on the inside, The LV compartment shall have front and end fully opening access doors. All doors shall be provided with three points latching suitable for padlocking and shall be fitted with a 3CR12 or stainless-steel restraining device to prevent whipping when opened. The units shall be so designed that no back access is necessary.

The unit shall be well ventilated and rodent proof and its construction and installation shall prevent the ingress of rain and sand. Should it be found over time that this requirement has not been met, the final retention monies will not be released until the remedial work has been proved to be effective.

Each unit shall be bonded to the other with a copper strap and to an earth bar run the full length of the LV unit. This shall be not less than 25mm x 6mm to which all items are to be bonded. The bar is to be earthed as further detailed in the Clause "Earthing and Bonding" elsewhere in this Part.

13.2 Finish

Unless otherwise specified elsewhere in this Specification the entire minisub, except the transformer tank, shall be either hot dip galvanised in accordance with the Clause "Hot Dip Galvanising" elsewhere in this Part or otherwise cooling tubes shall be galvanised and the rest shall be zinc metal sprayed to a thickness equivalent to that called for in the latter clause. The paint finish is to comply with the requirements set out in the Clause "Transformers" elsewhere in this Part.

Under no circumstances will an inferior quality finish be accepted and evidence of such will result in the Engineer requiring the minisub to be completely re-painted at the Contractor's expense.

13.3 Installation

The minisub shall be installed on a concrete plinth constructed as specified in the Clause "Plinths" elsewhere in this Part. It shall rest on two layers of 5 ply malthoid which shall be trimmed flush.

13.4 HV Compartment

Unless otherwise specified, one 3-way non-extensible ring main oil switch unit complete, comprising two oil switches and one HRC fused switch tee-off for connection to the transformer HV terminals, shall be provided. This unit shall comply generally with the Clause "HV Switchgear" elsewhere in this Part. The spare fuses shall be located in "Terry" clips within the compartment.

The connection between the live side of the tee-off switch and the transformer HV bushings shall be made using single core XLPE trailing cable tails which shall be so installed that a separation of 50mm is maintained between phases and to earth. No separators shall be used on the HV tails. All connections to bushings shall be puttied and taped.

Where no switchgear is called for, 11kV cable termination boxes shall be similar or equal to GEC Henley type 104L. Two mounting brackets suitable for the latter cable boxes shall be provided. The connection between cable boxes, and between the boxes and transformer bushings shall comprise 70mm² Cu XLPE insulated tails. The latter connection shall be long enough to allow termination to either of the boxes, i.e. from the front or the back box to the transformer.

In the case of 22kV or XLPE cable terminations, a "Raychem" type termination shall be used, wooden cleats being provided for support of the cables. Such terminations shall comply with the Clause "Outdoor Terminations" elsewhere herein.

A sheet of perspex shall be installed between the HV compartment door and the HV cable boxes or cable terminations covering the whole door opening, to avoid accidental contact with the HV cable terminals. The minimum distance between the perspex sheet and the cable terminals shall be 250mm. The wording "DANGER EXPOSED HV TERMINALS", in both official languages, minimum 75mm high and in red, shall appear in the centre of the perspex sheet.

Cable connections shall not be puttied and taped.

13.5 Extended HV Compartment

Where the configuration of HV circuits requires a switching station in a position near to a minisub, a non-standard minisub with extended HV compartment shall be used and the switching station and minisub combined to form a single unit. Such units may incorporate up to five extensible oil switches or oil fuse switches or combinations of these.

Switches in minisubs with extended HV compartments shall be Reyrolle Switchgear Type RS, GEC Alstom, Hawker Sidderly type Tiger or equivalent. Fused switches feeding external circuits shall be capable of carrying 90A, 356mm fuses.

Switches shall be enclosed in a steel cubicle of the same cross-section as the minisub to which it forms an extension. The cubicle shall be so arranged that each switch has a door in front of it and removable rear doors measuring 600mm x 600mm for terminating cables. Rear doors shall be removable by means of catches levered from the inside. The arrangement of switchgear and enclosing cubicle shall be such that cable terminations can readily be made.

Proof will be required that any minisubs of this type have been obtained from a Supplier who has previously manufactured similar units which have been operating successfully in the field for not less than two years. At least one such unit shall be made available for inspection locally before approval for the use of the proposed make is given.

Transformer Compartment

The transformers shall be of the hermetically sealed type complying generally with the Clause "Transformers" elsewhere in this Part.

The transformer accessories, ie: rating plate, tap-change switch, dial type thermometer, etc., shall be located such that they are safely accessible from the LV compartment.

13.6 LV Compartment

All equipment contained in the LV compartment shall be accessible from the front and shall be arranged such that any items of equipment may be easily removed or installed on Site.

At the bottom of the LV compartment, but high enough above the base of the minisub to allow adequate working space, minimum 3,0mm thick galvanised steel gland plates shall be mounted on suitable brackets.

The gland plates shall be in 250/300mm lengths for ease of removal and shall be bonded to the main earth bar using minimum 70mm⁵ bare copper conductor fixed with minimum 12mm brass bolts and nuts. The plates shall be pre-drilled for glands of the appropriate size for the total number of cables, present and future, as specified or indicated on the drawings.

The neutral busbar of minimum 50mm x 6,3mm hard drawn copper shall be mounted above the gland plate and shall be connected to the neutral terminal of the transformer using minimum 70mm² insulated copper conductor.

The neutral and earth bars shall be kept electrically separate until connected in accordance with the requirements of the sub-Clause "Transformer Earthing" elsewhere in this Part.

A chassis shall be provided above this neutral bar suitable for mounting six 15kA 200A TP MCB's at a minimum height of 400mm above the gland plate. The actual number and type of the MCB's to be provided in the minibus shall be as stated elsewhere in this Specification or on the drawings.

Moulded case circuit breakers shall comply with SABS 156 with time delay tripping on low overloads and high-speed tripping on short circuit. Except where larger rupturing capacity MCB's are elsewhere specified, these shall be Class 5kA 240V or 415V, as applicable, and where various current and breaking capacities are required, all MCB's are to be of one make throughout the installation. The Engineer will not accept a mixture of circuit breakers from various manufacturers to meet the various duties required.

Where MCB's are required to be connected to cables larger than 70mm², the terminals shall be of the stub busbar or rear connecting stud types, fitted with suitable phase barriers. For all other cables, box type terminals shall be provided.

A set of three 65mm x 6mm hard drawn copper busbars, colour coded for the respective phases, shall be provided above the circuit breaker chassis. The bars shall have a minimum of 32mm between them and 25mm to earth. They shall be held in position by insulated supports so sized and spaced that they will prevent busbar distortion under maximum short circuit conditions. At all connection points busbars shall be plated and the connection made with brass bolts, nuts and washers. Flat washers shall be provided on both sides of the connection and star washers beneath the nuts. Busbars shall be pre-drilled and plated for connection to the maximum number of circuit breakers. All connections from transformer to busbars and busbars to equipment are to be made with colour coded PVC insulated copper conductors terminated with hydraulically crimped lugs where applicable. The connections to the transformer bushings shall be puttied and taped.

The busbars shall be protected from inadvertent contact from above and by a removable shroud in front. The shroud shall be made from 6,0mm "Masonite Weatherboard" and shall be labelled "Danger Live Busbars".

A hinged steel panel shall be provided with three CT operated maximum demand reading ammeters and a voltmeter and selector switch installed thereon. These instruments shall be as specified elsewhere in this Part. The current transformers for the ammeters and other equipment shall be readily accessible.

Adjacent to this panel a fixed panel shall be provided with sufficient space for the mounting of street lighting equipment. This equipment will comprise a set of three 80A HRC fuses with shrouded holders and bases similar to GEC "Red Spot" fuses, 3 single phase kWh meters, a 60A TP contactor, a by-pass switch supplied through a 5A HRC fuse and up to 6 single pole, 30A CBI type 'SF' MCB's to discriminate with the type ST1 MCB's in the streetlight poles. Control shall be from a "National" thermally actuated photo-electric cell type ZS-2OAR installed in a vandal-resistant enclosure mounted under the roof at the rear of the minibus. The equipment itself shall only be provided if called for elsewhere in this Part.

13.7 Compartment Labelling

The doors of all compartments are to be provided with labels and notices as required by the Occupational Health and Safety Act, and as specified in the Clause "Labels and Notices" elsewhere herein.

14. DISTRIBUTION KIOSKS AND FEEDER PILLARS

14.1 Construction

The enclosure shall be of the type specified elsewhere and shall be of a size suitable to accommodate all the equipment specified hereunder and elsewhere in this Specification. All kiosks used on a particular installation shall, unless otherwise specified, be of the same size. All sizes will allow for a minimum of 15% spare capacity for future extensions and upgrades.

The unit shall be well ventilated, and its construction and installation shall prevent the ingress of rain and sand and it shall be rodent proof. Should it be found over time that this requirement has not been met, the final retention monies will not be released until the remedial work has proved to be effective. Cognisance shall be taken of the site conditions and the kiosks, and all equipment provided therein shall be selected to prevent deterioration under these conditions.

All units shall be provided with a robust and approved front door which shall be labelled as specified in the Clause "Labels and Notices" elsewhere herein. The door shall be provided with a restraining device of non-ferrous components to prevent whipping when opened, approved 3 point latching for larger and 2 point for 6 way and smaller units, and padlocking facilities. The external components shall be heavy duty die cast aluminium.

All hinges shall be stainless steel. All locking rods, guides, striker plates and similar accessories shall be hot dip galvanized mild steel.

14.2 Contents and Equipment

The equipment in the kiosks shall be mounted on a 9,5mm "Masonite Weatherboard" panel. This panel is to be supported on a galvanized steel frame which is to be fixed to the kiosk main frame. No equipment is to be attached to the removable kiosk enclosure.

Unless stated to the contrary elsewhere in this Specification, the panel shall have sufficient space for nine 80A SP Curve 1 (orange handle) 5kA MCB's, one maximum demand energy meter and one main circuit breaker rated at least 300A mounted in three rows of three units. The actual equipment to be provided in the kiosk is detailed elsewhere in this Specification.

Kiosks shall be pre-wired for all specified equipment whether supplied with the kiosk or not. All bare wire ends for future equipment on the front of the panel shall be heat shrink capped. Any other equipment mounted on the front of the panel shall be suitably shrouded.

Four plated HD copper bus bars minimum 25mm x 6mm mounted vertically on colour coded stand-off insulators shall be provided on the back face of the panel. They shall be provided with 12mm brass bolts, nuts and washers for the termination of the feeder cables and with 8mm brass bolts, nuts and washers for the total number of service connections for which the kiosk is designed.

The bus bars shall extend downward below the bottom insulator a sufficient distance to enable the incoming and outgoing main feeder cables to be connected vertically above one another.

Where MCB's are required for feeder cable protection they shall comply with the Clause "LV Circuit Breakers" elsewhere in this Part.

A 2mm thick galvanized metal gland plate shall be bolted to the abovementioned frame above the root. The gland plate shall extend the full length and width of the kiosk. The section of the gland plate behind the panel shall be for the main kiosk feeder cables whilst the remaining portion of the gland plate shall be for the outgoing service cables.

The gland plate shall be pre-drilled for the feeder cables specified and for the total number of service cables for which the kiosk is designed, regardless of the number utilised at this stage.

The gland plate shall be provided with two 75mm long brass or stainless steel bolts with the stud facing upwards, one of 12mm dia. for the feeder cable earth conductors and one of 8mm dia. for the service connection earth conductors. The bolts shall be held by nuts and washers to the gland plate and each lug shall be individually bolted to the stud. The neutral bar shall be connected to the 12mm stud with 70mm² PVC insulated earth conductor.

14.3 Steel Kiosks

The enclosure shall either be constructed of 3CR12 low grade stainless steel as manufactured by Southern Cross Steel or of hot dip galvanized steel.

Unless otherwise specified, the following minimum plate thicknesses shall be used:

3CR12	-	2,0mm
HDG Steel	-	3,0mm

The actual type of steel to be used in the construction of the kiosks is detailed elsewhere in this Specification.

The manufacturer shall, upon request, provide mill certificates for the stainless steel used in the manufacture of 3CR12 kiosks. All welding of 3CR12 kiosks shall be done using MIG welding. All welded areas shall be pickled and passivized after welding. Hot dip galvanising shall be in accordance with the Clause "Hot Dip Galvanising" elsewhere in this Part.

Steel kiosks shall be provided with a 50 x 50 x 6mm hot dip galvanized channel under base for bolting down onto a concrete plinth as specified in the Clause "Plinths" elsewhere in this Part. The top of the plinth shall be located as for roots under the sub-clause "Construction" above.

Kiosks shall be painted to a colour, specified elsewhere, as follows:

3CR12 -	Heat fused electrostatically applied epoxy powder coating to a thickness of 70 microns.
HDG -	One undercoat and two coats of suitable outdoor type enamel paint applied after approved passivation and priming.

14.4 Fused Feeder Pillars

Fused feeder pillars for outdoor use shall be housed in a kiosk of similar construction to that for distribution kiosks described above. The kiosk shall be large enough to accommodate all the equipment described hereunder and shall have a min. 2,0mm thick galvanized steel gland plate running the full width of the kiosk, and a 25mm x 6,3mm HD copper earth bar.

All equipment shall be mounted on a galvanized steel frame which shall be welded to the gland plate such that the kiosk enclosure may be removed without disturbing any of the enclosed equipment. Where required for the mounting of instruments, etc., a solid pine cored blackboard, bolted to the steel frame, shall be used.

The feeder pillar shall contain the number of units called for elsewhere in this Specification. Each unit shall comprise three HRC fuse bases with insulated fuse bridges and a bare neutral link, in their formation. The units shall be of a standard factory-made type similar or equal to those produced by GEC Alstom.

The units shall be mounted side by side and linked with 500A rated copper bus bars across each horizontal line of fuses and neutral links. A 500A rated bolted isolating link shall connect the end of each of the phase bus bars to an insulator to which the main incoming cable tails are to be connected. All connections are to be made using brass bolts, nuts and washers.

Three metering current transformers of the ratio elsewhere specified shall be provided, one on each phase tail of the incoming cable. Three maximum demand reading ammeters and a voltmeter and selector switch shall be mounted adjacent to or above the fuse units. The instruments shall be as specified elsewhere in this Part.

The fuse bases and bridges shall be suitable for HRC fuses from 30A up to 300A complying fully with SABS 173. One complete set of fuses of the sizes elsewhere specified shall be fitted and two sets of spare fuses of each size shall be provided, mounted in stainless steel clips attached to the back of the door. Fuses shall be HRC type complying fully with SABS 172. The breaking capacity shall be AC20 and the fusing factor Class Q1.

Where a fused feeder pillar is required for use inside a substation building, it shall be generally as described above, except that there shall be no enclosure and the equipment shall be mounted on a frame which shall be fixed to the floor and the wall of the substation. All live parts shall be shrouded to prevent accidental contact.

15. PLINTHS

15.1 Location

The plinth shall be located at the position shown on the drawings. Where the location is in a hollow susceptible to pounding of water, an alternate position shall be obtained from the Engineer.

15.2 Foundation

All vegetation, organic material, rubbish and other objectionable material shall be removed. Stumps and roots, including matted roots, shall be removed to a depth at least 200mm below the cleared surface. The earth mat required in terms of the Clause "Earthing and Bonding" elsewhere in this Part, shall then be installed.

The surface shall be moistened to optimum moisture content and thoroughly compacted with a vibrating pan compactor.

When the cleared surface is below the required founding level, the level shall be raised by backfilling with approved material.

The material shall be placed in horizontal layers not exceeding 150mm in depth, and each layer shall be moistened to optimum moisture content and compacted to a density of not less than 93% of Modified AASHO density (100% for sand).

An approved impermeable sheet, with a plan area not less than the plinth area, shall be laid over the completed founding surface before placing of the reinforcement, shuttering and concrete for the plinth.

When the founding surface is rock, all loose material shall be removed, shuttering and reinforcement erected, and the concrete shall be placed directly on to the rock surface which shall be moistened before concreting commences. Under these conditions the Engineer's instructions regarding the earth system shall be obtained.

15.3 Construction

The plinth shall be 300mm thick and of sufficient dimension to allow 150mm clear around the edge of the equipment, with a steel reinforcing mesh, Ref. No. 395, extending its full length and width. The top of the plinth shall be 200mm above top of Kerb or, where no kerbs are installed, 350mm above road level.

The shutter shall be erected such that no displacement can occur during concreting. Suitable pockets for bolts (except in the case of mini subs) and holes for cable entry shall be provided. Shuttering shall not be stripped within 24 hours of concreting.

The reinforcement shall be supported in its correct position by approved spacers. Reinforcement shall conform to Standard Specification CKS 102, "Welded wire mesh for concrete reinforcement".

The concrete shall be batched by volume and the following mix proportions shall be used.

		Aggregate		
Condition of Fine Aggregate	Cement kg	fine m ³	coarse m ³	Maximum added water Litres
Dry	50 (1 pocket)	0,065	0,100	26
Moist	50 (1 pocket)	0,080	0,100	20
Wet	50 (1 pocket)	0,085	0,100	15

The coarse aggregate shall be 20mm nominal size.

Aggregates shall conform to SABS 1083.

Water shall be suitable for drinking without further treatment.

Concrete shall only be placed after the forms, reinforcing steel, and preparations for casting have been inspected and approved by the Engineer or Clerk of Works. It shall be placed promptly, with a minimum of handling, to avoid the segregation of aggregates or the displacement of reinforcement.

Each plinth shall be completed in a continuous operation with no interruption. The concrete shall be deposited in the form as near to the final position as possible; it shall not be deposited in a heap and worked into position in the process of compacting.

All concrete shall be worked into intimate contact with the reinforcing steel and shuttering without displacing it. No plastering of surfaces will be allowed.

The concrete shall be compacted by rodding and spading to ensure that all voids are eliminated.

15.4 Curing

During the first stages of hardening, concrete shall be protected from the harmful effects of sunshine, drying winds and cold, and also from running or surface water.

No concrete shall be placed when the temperature is at or below 10°C or is likely to fall below 5°C within the next twenty-four (24) hours. During cold weather, when the temperature remains below 7°C for extended periods, the concrete shall be protected by means of tarpaulins, straw covering or similar means for at least five (5) days after placing.

For purposes of strength attainment and shrinkage crack prevention, concrete shall be cured in one of the following ways:

- (a) Maintaining the concrete in a continual wet condition for at least seven (7) days after the placing of the concrete by covering with moist sand at least fifty (50) millimetres thick

or

- (b) Utilisation of a proved and approved non-bituminous pigmented liquid compound conforming to the requirements of AASHTO Specification M.148, Type 2. The compound shall be applied strictly in accordance with the recommendation of the manufacturer.

15.5 Surface Finish

On completion of placing and compacting of the concrete as specified above, the top surface shall be stamped with a tapping board to compact the concrete thoroughly and to bring mortar to the surface, leaving the surface slightly rough but generally at the correct elevation. It shall then be finished with a wooden float to a smooth even surface without any unevenness of more than three (3) millimetres showing under a straight edge. The outside edge shall be bevelled to 50mm wide. Plastering will not be permitted under any circumstances.

15.6 Holding Down Bolts

Holding down bolts will be required to fix the switchgear to the concrete plinths. The size, number, type and position of the bolts are dependent on the type as well as the make of the equipment.

The bolts shall be installed in one of the following ways: -

- (a) Grouted into previously constructed recesses
- (b) Role bolts or similar fastenings

15.7 Finishing Off

After the forms have been stripped, the surrounding ground shall be built up to the top surface to ensure that water is led away from the plinths.

16. MAIN DISTRIBUTION SWITCHBOARDS

These are defined as boards controlling the main supplies, either incoming and/or outgoing, by air break or moulded case circuit breakers, or the outgoing supplies with fused-switch units. Where elsewhere specified, the incoming supplies may be controlled by - isolators.

Such boards may be termed main or sub-main distribution boards. The boards are to comply with BS 5486, with particular regard to testing.

Where specialist manufacture of boards is called for elsewhere in this Specification, under no circumstances will such boards be accepted unless supplied by a manufacturer who uses components, the majority of which have been designed and tested by his own firm and carry approved Testing Authority Certificates relating to the performance of such components. Relief from this condition will only be given by the Engineer in extreme circumstances, and must be in writing, such relief must be obtained before submission of a tender.

The switchboards shall be suitable for the supply voltage, frequency and phase arrangement as detailed elsewhere in this Specification and shall be of the flush fronted cubicle type, floor mounted and arranged for back access, built up of standard factory made units to form an easily extensible board. The cubicles shall comprise a welded or bolted framework of steel sections with minimum 1,6mm thick steel panel cladding. The panels shall be either hinged or removable for ease of access. Securing of panels shall be by means of square key latches with bottom locating pins in the case of fixed panels. The edges of all doors and removable panels shall be so constructed that they can readily accept a rubber gasket, should dust and damp proofing be required.

All equipment shall be mounted behind removable fascia plates; only switch toggles, etc., protruding. Doors over the toggles shall only be provided when asked for elsewhere in this Specification.

Air break or moulded case circuit breakers shall comply with the Clause "LV Circuit Breakers" elsewhere in this Part. All incoming circuit breakers of 800A or larger shall be withdraw-able pattern. All incoming and outgoing switches shall be provided with means for padlocking in the "OFF" position. Three maximum demand reading ammeters and a voltmeter and selector switch, as specified in the Clause "Instruments, Meters and Protection Relays" elsewhere in this Part, are to be provided for each incoming supply circuit breaker.

No board shall exceed 2,4m in height nor shall any operating handle, button or switch be mounted higher than 1,8m. No part of any equipment shall be mounted closer than 300mm to the floor.

The bus bars shall be mounted at the top of the board, enclosed by the removable full height panels at the back, removable top panels and removable front panels covering the bus bar section only. Droppers from the enclosed bus bar chamber shall pass through insulating barriers located as necessary. Where bus bars are exposed in cubicles requiring access for operation or maintenance, they shall be shrouded with a suitable insulating material.

The bus bars shall be of high conductivity copper bar of adequate section for the current and short circuit rating. The current density shall not be more than 185A per square centimetre at the current rating specified.

Bars shall have a minimum spacing of 32mm between bars and 25mm to earth. Where multiple bars are used, the air gap between bars shall be the same as the bar thickness. Bus bars shall be securely supported by insulators of a size and so spaced that they will prevent bus bar distortion under maximum short circuit conditions. Equipment shall be arranged to connect to the bus bars with solid copper connections of adequate section to resist short circuit stresses imposed by faults up to the maximum breaking capacity of the associated switchgear. Joints between bus bars and the equipment shall be tinned and connected using phosphor bronze or stainless steel nuts and washers above a fault level of 20kA or cadmium plated steel below this rating.

Flat washers shall be provided on both sides of the connection and spring lock-washers beneath the nuts. Bus-bars shall be pre-drilled and tinned at both ends for future extensions and removable plates shall be fitted at either end of the bus bar chamber to enable such extensions to be made. Suitably drilled and tinned fishplates for later coupling of the bars shall be provided.

Air-break fused-switch units shall be provided with best quality dust and damp-proof ironclad cases, arranged for flush mounting. The switch shall be of the double break type, with the speed of operating being independent of the operator. In the case of tiered construction, insulating barriers are to be installed between all fused-switch units. The doors of the fused-switch units shall be hinged and interlocked with the mechanism so that the case cannot be opened with the switch closed or the switch closed with the case open. With the case open, no live parts shall be exposed. Switches shall have definite "ON" and "OFF" positions, which shall be clearly marked. All switches shall be provided with means for padlocking in the "OFF" position. The number of poles shall be as specified on the drawings. The current rating shall not be less than the current rating of the fuses as specified on the drawings, except that 160A HRC fuses may be fitted into 150A fused-switch units.

Fuse holders shall be of the shrouded type and shall comply with SABS 173.

Fuses shall be of the HRC type and shall comply fully with SABS 172. The breaking capacity shall be AC20 and the fusing factor Class Q1. The current ratings shall be as elsewhere specified. Six (6) spare HRC fuses for each switch used in the switchboard shall be supplied and the value included in the tender price, except that a maximum of 6 spare fuses of any one size are required per switchboard. All such spares shall be mounted in stainless steel clips in a special compartment attached to the board, this being marked "Spare fuses". The metal clad covers of the fused-switches shall be provided with labels indicating their purposes. Where retractable type units are used, both the carriage and the panel are to be labelled.

Cabling arrangements shall be such that outgoing feeder ends can be made off with the board live at all times. This shall be provided for by means of a 2mm galvanized gland plate in close proximity to the outgoing terminals of the switchgear. All gland plates shall be bonded to the earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

The underside of the board shall be rendered vermin proof by means of similar plates to the gland plates above.

The outgoing connections from tiered equipment are to be brought out to separate terminals behind each switch for ease of making the outgoing connections.

The whole switchboard is to be suitable to control the circuits shown on the drawings, but the actual arrangement of the board is left to the Tenderer so that the most cost effective arrangement for the type offered will be obtained. Space shall be left to allow access to the rear of the board. The board must be designed to fit into the space available and be of suitable dimensions to enter through the doorways provided. The board must be suitably located to permit future extension at either end and must be bolted to the floor.

Provision must be made for the future addition of further outgoing switches to the switchboards. The board must be so designed as to allow space for the addition of these units.

Unless otherwise specified elsewhere in this Specification the number to be allowed for shall be the nearest whole number above 20% of the number of each type of switch unit actually supplied on each board. The current rating to be allowed for each future unit shall be the same as that of the largest outgoing switch of which more than one is actually supplied on each board.

A continuous earth bar sized to match the specified fault rating of the board but of not less than 25mm x 6,3mm cross-section shall be run along the entire length of the board and shall be provided with minimum 10mm cadmium plated bolt for connection of the earth conductor.

All metal surfaces of the boards shall be epoxy powder coated to a thickness of 70 microns to SABS 1274 and of an approved quality and colour. No hammer tone or similar finishes will be acceptable, and the final colour of the board shall be a standard SABS colour. Before painting, all boards shall be bonderized or given some similar rustproof treatment to approval. It is the Contractor's responsibility to ensure that when handed over, the board finish is in first class condition. Under no circumstances will boards be accepted if not finished to a first-class standard at handover.

17. MCB MAIN, SUB-DISTRIBUTION BOARDS AND CONTROL PANELS

In general, such boards shall comply with SABS 1180 where applicable, or alternatively with BS 5486, and in particular, with the requirements of this Clause.

Larger MCB distribution boards and motor control panels shall be floor standing and arranged for front access unless elsewhere stated in this Specification. Such boards shall be bolted in position. No board shall exceed 2,4m in height nor shall any meter scale, operating handle, button or switch be mounted higher than 1,8m or lower than 600mm from the floor. No part of any equipment shall be mounted closer than 300mm to the floor.

Minor types of main and sub-distribution boards and control panels shall consist of sheet metal trays, suitably built in or secured on the surface in the positions shown on the Engineers drawings.

All structural elements of main and sub-distribution boards and the complete construction of motor control panels shall be of minimum 2,0mm thick material. Non-structural elements shall be of 1,6mm material.

Minor bonding trays shall be of 1,2mm material and all bonding trays shall be galvanized. All boards to be mounted outside or specified as being weather-proof shall be constructed of 2,0mm 3CR12 sheet, epoxy powder coated to a thickness of 70 microns to SABS 1274.

The boards shall be of the minimum sizes to accommodate all the equipment specified plus future circuit breakers. Where single phase breakers are used in three phase boards, there must be arranged in three vertical rows, one for the breakers in each phase. Space for the nearest whole number above 20% of each type of circuit breaker installed is to be provided for unless otherwise specified. Unless made specifically to clip in from the front, blanking plates shall be fixed with short cadmium plated bolts and nuts. All openings for future equipment shall be covered with blanking plates fixed on the inside of the opening.

Sufficient outgoing terminals shall be provided for the future equipment. Cognisance must be taken of the heat dissipated by equipment and adequate ventilation must be provided.

Copper bus bars are to be provided for each phase and are to be mounted on suitable insulators or fixed to the terminals of the miniature circuit breakers and be of sufficient length to accommodate future breakers. Bus bar and other connections shall be made using cadmium plated steel (or brass in Coastal areas) bolts, nuts, flat and spring washers.

Copper bars are to be used on MCB type main boards. The main neutral feed to the bus bar shall be connected by a lug bolted to the bar, as described above. In sub-distribution boards the neutral bus bars shall be solid brass with two per-way pinching screws and sufficient ways for the feed and all the circuits connected, including spare ways to the same number as the spare circuits.

HRC fuses are to comply with SABS 172 and fuse holders, which shall be shrouded, with SABS 173. A spare set of HRC fuses for each switch-fuse unit or set of fuse holders installed shall be supplied and the value included in the tender price, except that a maximum of 6 spare fuses of any one size is required. All spares shall be handed to the Employer's representative at the time of the handover inspection.

The equipment on these boards shall be mounted on chassis behind sheet metal panels with operating handles, toggles and control buttons, etc., only protruding through slots cut in the panels. The isolating device for all motors situated remote from the control panel shall be lockable in the "OFF" position. The panels shall be either hinged or removable for ease of access to the wiring, etc. Securing of panels shall be by means of square key latches with vertical locating pins in the case of fixed panels. Sub-distribution board fascia panels shall have moulded knobs for ease of removal of the panel.

The interior of the boards shall be arranged for easy access to all wiring and components. Transformers for low voltage supplies and all low voltage wiring shall be separated by metal barriers from the medium voltage circuits. Positions of transformers are to be indicated by labels attached to the face of the board.

All equipment on the boards shall be back-connected and no wire or cable shall be visible from the front. PVC insulated wiring shall be used throughout, the current rating being not less than the rating of the circuit breaker or aggregate rating of the bank of circuit breakers which it connects.

Wiring of the boards shall comply generally with the Clause "Control Equipment and Wiring" elsewhere in this Part.

Distribution boards shall be at least 115mm in depth unless otherwise approved. A maximum of two rows of conduit shall enter the horizontal edges of boards and the width of the board must be sufficient to accommodate all conduits entering.

Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to the entire back of the board. The trays of flush boards shall be built in or suitably secured to the brickwork in the specified places, and shall be installed in good time to prevent delay to the

Principal Contractor. Each shall be mounted with the upper edge at a height of 2,0m above floor level, unless otherwise specified.

Unless otherwise specified elsewhere in this Specification, boards contained in cupboards shall be surface mounted and all conduits shall drop into them neatly, vertically and evenly spaced, in a single row, if possible. Metal doors shall only be fitted if so specified.

Unless otherwise specified elsewhere in the Specification, surface and flush boards shall be provided with doors. All control panel doors shall be fitted with dust and damp-proof seals. All instruments, meters, pilot lights, etc., and the main isolator must be operable with the doors closed unless otherwise specified. Flush boards in walls shall be provided with a separately attached metal frame and door which is adjustable so that it may be set plumb.

This is to be positioned only after preliminary wall finishes adjacent to the board are complete. Doors shall be secured by a neat flush catch. Boards with a width of 600mm or greater shall be fitted with double doors, the left-hand door to be secured with brass barrel bolts, top and bottom, which are readily accessible. Hinges shall be "Barker and Nelson" or "Piranha".

All metal surfaces of the boards shall be epoxy powder coated to a thickness of 70 microns to SABS 1274 and of an approved quality and colour. No hammer tone or similar finishes will be acceptable, and the final colour must be readily match able. Before painting, all boards shall be bonderized or given some similar rustproof treatment to approval. It is the Contractor's responsibility to ensure that when handed over, the board finish is in first class condition. Under no circumstances will boards be accepted if not finished to a first-class standard at handover.

In the case of MCB Main Boards cabling arrangements shall be such that outgoing feeder ends can be made off with the board live at all times. This shall be provided for by means of a 2,0mm galvanized gland plate in close proximity to the outgoing terminals of the switchgear. All gland plates shall be bonded to the earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

The underside of the board shall be rendered vermin proof by means of similar plates to the gland plates above.

Where boards are to be mounted in damp situations or where otherwise specified elsewhere in this specification, black heat anti-condensation heaters are to be fitted. The heaters are to have a separate protective device and are to be so constructed and fitted that they cannot be inadvertently touched.

The heater rating is to be such that it will maintain the board at a suitable temperature to prevent the occurrence of condensation while not rising to an excessive temperature.

Boards shall be labelled in accordance with the Clause "Labels and Notices" elsewhere in this Part.

18. LV CIRCUIT BREAKERS

18.1 General

The supply voltage, normal current, fault capacity and type, as well as any special characteristics required of circuit breakers, shall be as stated elsewhere in this Specification.

All main circuit breakers shall be equipped with adjustable instantaneous magnetic and inverse time delay thermal overload releases on each phase and shall be arranged for flush mounting. They shall be connected to the bus bars with solid copper connections of adequate section to resist short circuit stresses that may be imposed by faults up to the maximum rupturing capacity of the breaker.

Where circuit breakers are used to control supply taken directly from the Supply Authority, they shall be of a make approved by that Authority and shall be set to trip within the specified limits laid down by that Authority.

18.2 Air Circuit Breakers

Air circuit breakers shall comply with the requirements of BS 4752. Unless elsewhere specified, air circuit breakers of 800A or larger shall be of the rack-out type. Interlocking shall ensure that racking in or out can take place only with the circuit breaker open. The connecting device between the incoming cable and the breaker and between the circuit breaker and the outgoing bars shall be fitted with shutters which are automatically closed and locked by the action of racking out.

18.3 Moulded Case Circuit Breakers

Moulded case circuit breakers shall comply with SABS 156 with time delay tripping on low overloads and high-speed tripping on short circuit. Except where larger rupturing capacity MCB's are elsewhere specified, these shall be Class 5kA 240V or 415V, as applicable, and where various current and breaking capacities are required, all MCB's are to be of one size throughout the installation. All MCB's are to carry the SABS Mark to ensure that they comply with Compulsory Specification VC 8036.

The Engineer will not accept a mixture of circuit breakers from various Manufacturers to meet the various duties required.

In the case of motor control, all MCB's shall be supplied with "slow" tripping curve (Curve D or curve 1) except that those MCB's controlling motor starters located in the same control panel shall not have over current trip elements, this feature being provided by the adjacent starter overload device, magnetic high current protection only being required.

Where MCB's are required to be connected to cables larger than 70mm², the terminals shall be of the stub bus bar or rear connecting stud types. For all other cables, box type terminals shall be provided. Three phases MCB's shall be fitted with suitable phase barriers.

MCB's shall be fitted with purpose made terminal shrouds where no fascia plate is provided.

19. ELECTRICAL ENERGY METERS

Electrical energy meters shall be installed with the specified CT's on the main incoming feeder cable feeding the distribution kiosk/switchboard. Correct programming will be done by the supplier of the electrical energy meter and the contractor will be responsible to determine from the supply authority the correct tariff characteristics for the applicable connection.

20. INSTRUMENTS, METERS AND PROTECTION RELAYS

20.1 General

All indicating instruments and meters shall have 5A HRC fuse protection on all voltage connections.

All meters and instruments shall have labels fitted below, stating in which circuit they are installed and the multiplying factor, where appropriate.

All instruments shall have a red line marked on the scale at the normal or maximum operating point as appropriate.

The cases of all meters shall afford complete protection from dust and damp and shall be suitable for the attachment of seals.

Selector switches shall be rated at 16A and shall be similar to Sprecher and Schuh, Telex, Krause and Naimer or equivalent. They shall be provided with an "OFF" position.

All instruments and meters shall comply with the appropriate British Standards Specification.

The Tenderer shall submit full details of the meters, instruments and control switches offered in his tender, including connection diagrams for all equipment.

Protective circuits will operate at 30V DC unless otherwise herein specified elsewhere.

20.2 Potential Indicators

Potential indicators shall comprise three neon indicating lamps each energised from a capacitor bushing connected to indicate that the incoming cable or the bus bars, as elsewhere specified, are alive.

20.3 Protection Relays

Protection relays shall be supplied in accordance with the following requirements unless otherwise detailed elsewhere in this Specification. All relays not covered herein will be specified in detail elsewhere in this specification.

Over current and earth fault relays shall be of the static type with either inverse definite minimum time characteristic adjustable from inverse to extremely inverse or definite minimum times of 2,4 or 8 seconds selectable on the relay.

Over current settings shall be adjustable from 50% to 200% in 2,5% steps and time settings from 5 to 100% of the DMT. Earth fault current settings shall be adjustable from 10% to 40%.

Generally, two over current and one earth fault relay shall be mounted in a common housing. A suitable relay would be the GEC type MCGG52. Any other relay offered must be an approved equivalent to this unit.

Sensitive earth fault relays shall be of the static type. Current settings shall be from 0,5% to 8% in 5 steps. The time delay unit shall be adjustable from 0,1 to 9,9 seconds in 0,1 steps or 10x these times, selectable on the relay. A suitable relay would be GEC type MCSU. Any other relay offered must be equivalent to this unit.

20.4 Current Transformers

Current transformers shall be epoxy-resin encapsulated. The rated burden shall be not less than 10VA, unless specified otherwise elsewhere. They shall comply with BS 3938 and shall comply with the following table.

Application	Primary Current	Class
Indication	All	5
Protection	All	3
Metering	Up to 250A	1
Metering	250 - 600A	0,5
Metering	600 - 800A	0,2
Metering	800A and above	0,1

20.5 Voltage Transformers

Voltage transformers shall comply with BS 3941 Class 0.5 accuracy and shall be 3 phase oil filled units mounted on top of the HV switch panel, arranged for horizontal draw-out. The output shall be 50VA per phase at 110V phase to phase unless otherwise specified. Fuse protection shall be provided on both primary and secondary.

Such transformers shall not be affected by single-phasing on the HV side.

20.6 Indicating instruments

All instruments shall be square format industrial accuracy grade to BS 89 and shall be flush mounted. All main instruments shall be 96mm square, meters for individual drives or in modular panels being 72mm square.

Ammeters:

All ammeters, including whole current ammeters, shall be calibrated to 120% of the rated current. The overload capability shall be 10 x rated current for 1,0 second. Those reading in excess of 100A shall be CT operated with 5A full scale deflection.

Instantaneous reading ammeters shall be of the moving iron type, one instrument being provided, connected via a phase selector switch with "OFF" position.

Maximum demand reading ammeters shall be of the combined maximum demand and instantaneous type, one meter being supplied per phase, unless otherwise specified. They shall comprise a thermal maximum demand ammeter with drag pointer combined with a moving iron instantaneous pointer. The drag pointer reset knob shall be sealable. The bimetal system shall be ambient temperature compensated and shall have a 15 minute response.

Where dual ratio CT's are specified, ammeter scale plates are to be engraved on both sides to suit these ratios, the plate for the lower ratio being outermost.

Voltmeters:

Voltmeters shall be of the moving iron type. One instrument shall be provided in each instance connected via a selector switch to read line to line voltages and also line to neutral voltages.

Volt meters for HV use shall be suitable for operation on the 110V side of the voltage transformer, while LV volt meters shall operate off a nominal line to line voltage of 400V. The scales between 90% and 110% of nominal voltage shall be graduated in 1,25% divisions.

PF Indicators:

Power factor indicators shall be of the moving iron type suitable for use on unbalanced loads.

21. CONTROL EQUIPMENT AND WIRING

21.1 Time Switches

All time switches shall be mounted in an accessible position for ease of adjustment and shall be provided with re-chargeable nickel cadmium batteries to provide up to 48 hours of operation should a power failure occur.

Motor Control:

Time switches shall be fully programmable to a maximum of 168 switching points with 24 memory addresses permitting hourly, daily and weekly settings.

The shortest switching interval shall be 1,0 minutes. The units shall include a manual override facility. They shall be suitable for wall or DIN-rail mounting. Protection shall be at least to IP42 and the units shall operate satisfactorily in the temperature range - 5°C to + 55°C. A suitable time switch would be "Sauter" type Memotime Z5D 7.

General Purpose:

Time switches shall have a crystal-controlled stepping motor and be able to perform 48 operations per day with a minimum interval of 30 minutes. A manual override facility must be provided. A suitable time switch would be "Heinemann" type SAT-R.

21.2 Low Voltage Transformers

Bell and other low voltage transformers shall be of the double wound type having the secondary voltage specified and shall have an adequate capacity for the duty required but, in any case, not less than 50VA on short-time rating. The transformers shall comply with SABS 743 and shall have one end, or the centre point of the low voltage winding earthed.

21.3 Contactors

Contactors shall, unless otherwise specified, comply with BS 775 for current making and breaking Category ACI for non-inductive loads and Category AC3 for inductive loads.

21.4 Earth Leakage Protection Units

Earth leakage protection units shall be single or three phase, as indicated, with a sensitivity of 30mA, unless stated to the contrary elsewhere in this Specification or on the drawings. The unit shall actuate a shunt trip isolator or MCB as specified.

The earth leakage units shall comply with SABS 767 and shall carry the SABS Mark to ensure that they comply with Compulsory Specification VC 8035 promulgated in Government Gazette No 10987.

21.5 Relays

All relays and timing relays are to be of Sprecher and Schuh, Telemecanique, Klockner-moeller, or approved equivalent manufacture. Each relay is to be numbered and this number must appear on both relay and adjacent to its respective base in the case of the plug-in type. All adjustable timing relays must be labelled with their function.

21.6 Photo-electric Controls

Photo-electric switches shall be of the type comprising a photosensitive resistor, thermal actuator with an inherent operating delay to make it insensitive to short duration changes in light levels and a changeover switch mechanism, all housed within a tough, translucent, weather and ultraviolet resistant cover. The operating level shall be factory pre-set to switch on at approximately 50 lux and off at approximately 100 lux. The response time after sudden changes in light level shall be not less than 15 seconds.

Integral protection against voltage surges shall be provided.

A suitable unit would be the "National" type ZS-20AR.

21.7 Main and Control Circuits

All control equipment shall be mounted in a separate hinged panel fitted with square key latches to permit ease of access to terminals, etc., at the rear of the panel.

Where bus bars are located directly behind such panels, a separate removable insulated panel shall screen them.

All wiring shall be carried out using suitably rated, colour coded insulated wire. Internal wiring to and from contactors shall be sized according to the contactor manufacture's recommendation for the duty selected.

All main terminals are to be connected in strict phase rotation. Wires shall not be joined between terminal points and no terminal shall have more than two wires connected to it unless they are lugged connections.

Spare terminals are to be provided to accommodate all spare control cable cores. All terminals shall be either bolted or screwed. All terminals for wires smaller than 16mm² shall have pressure plates. All terminals for the connection of external control wiring shall be of the "disconnect" type.

All terminations shall be fitted with numbered ferrules, the numbers corresponding to those on the appropriate wiring diagrams to be prepared by the board manufacturer. All terminal strips are to be similarly numbered.

Generally, wiring shall be enclosed in strategically placed plastic wireways. Small numbers of wires to remote positions may be neatly strapped, using plastic buckle clips or hard plastic "loom formers". Where wiring is run to equipment mounted on hinged doors, the wiring shall be carried in a plastic "loom former" which is so installed that the wiring is not strained with the door fully open.

The colour of all panel wiring shall comply with the following: -

- Colour of wire Circuit Particulars
- Red, White and Blue Phase connections in current and voltage transformer circuits and in all three phase circuits.
- Green/yellow bi-colour Insulated earth wires.
- Black Neutral connections.

- Grey Control connections.
- White Connections in DC alarm circuits.
- All control circuits shall have 5A HRC fuse protection.

21.8 Labelling

All control equipment both within the panel as well as all projecting items, are to be labelled in accordance with the Clause "rebels and Notices" elsewhere in this Part. Any device which can be unplugged is to be label at the base and on the device.

22. TRENCHING, EXCAVATION AND COMPACTION

22.1 General

The Contractor shall allow for all excavation and back-filling of cable trenches and holes for planting of poles unless this is stated to be done by others elsewhere in this Specification. In this case the Contractor shall provide the trenching contractor with details of his requirements in this regard prior to work being commenced and shall be responsible for ensuring that these requirements are met.

He shall also be responsible for ensuring that any trenches opened by him or for him do not constitute a hazard to the public. Where necessary he shall provide barriers and warning lights at night or any other protection of trenches or excavations as required by the Engineer or any statutory or local Authority requirements.

The Contractor shall be responsible for leaving all areas affected by cable trenches, holes in the ground, and any other work done by him or on his behalf, in a clean and tidy state, and for making good all tarmacadam, concrete, paved or grassed surfaces.

It will be the Contractor's responsibility to make good any subsidence that may occur within six months of back-filling trenches, and, in the case of tarred-surfaces, to remove and re-tar with new material.

22.2 22.2 Routing

The routes for the underground cables are shown on the drawings. Any proposed variation of these routes by the Contractor, shall be approved by the Engineer or Clerk of Works before trenching is done.

It shall be the Contractor's responsibility to ensure that the routes of the cables are correct. Where the Contractor is in any doubt regarding peg positions, he shall, after having obtained the approval of the Engineer, employ the services of a registered Surveyor to obtain the correct locations. Re-imbusement for the cost of such services will, subject to

granting of approval, be made from the Provisional Sum included for this purpose. Any major deviation considered necessary must be approved by the Engineer. The Employer will make no payment for claims for extra work arising out of the cable trenches being in the wrong place.

Routes shall run generally in road reserves parallel with and 1,0m from plot boundaries. Where no road exists or is not indicated, the route shall run in open ground adjacent to the plots and 1,0m from the plot boundaries.

22.3 Trenching and Excavation by Others

The Contractor is to co-operate closely with the trenching contractor at all times and is required to be in attendance during backfilling of all trenches, etc., to ensure that cables are not damaged in any way and that poles are correctly aligned.

22.4 Type of Material

Unless otherwise specified elsewhere in this Specification or Schedule of Quantities, Tenderers shall allow for excavating cable trenches and holes in earth. In addition, unit rates shall be provided for excavating in soft rock and hard rock.

The following definitions shall apply to the three categories. Where the conditions experienced are a combination of two or more of the conditions listed below, the Contractor shall be paid on rates in proportion to the contents of earth, soft rock or hard rock experienced in the excavations.

"Earth" shall mean ground that can be removed by hand and includes loose gravel, clay, made-up ground, loose or soft shale, loose oukclip, and boulders less than 75mm in diameter.

"Soft rock" shall mean all hard ground such as oukclip, hard shale, decomposed rock, loose boulders and large stones, etc., which require the use of pneumatic tools, mechanical rippers and/or excessive hard labour to excavate and remove economically.

"Hard rock" shall mean granite, quartzite, dolomite, or other rock of similar hardness, which can only be excavated and removed economically by blasting, wedging or breaking.

22.5 Verification of Excavation Claims

Notwithstanding any Provisional Amounts for excavation in rock included in the Schedule of Quantities, payment will only be authorised for excavation in ground other than earth upon submission of documentary proof of such excavation made and signed as correct at the time trenches or holes were excavated.

It is essential that, in all cases where rock has to be excavated, or where poles, etc., have to be stabilised with concrete or by other means, in loose sand or in soft or waterlogged ground or where substitution of the excavated material is necessary for backfilling, that the Engineer or Clerk of Works be notified before such excavation work is back-filled. This is for the purpose of having the soil conditions encountered noted and confirmed in writing.

The amounts and type of rock encountered shall be measured by the Contractor in the presence of the Engineer or Clerk of Works. This information, together with the date and locality, shall be entered by the Contractor in a suitable triplicate book furnished by him. These entries shall be signed by the above parties. The original sheet shall be submitted to the Engineer and the duplicate copy shall be attached, by the Contractor, to his monthly invoice.

22.6 Precaution with regard to other Services

The Contractor shall exercise extreme caution in his work to avoid damage to existing underground services. Certain services may be indicated on the drawings, but it is not to be assumed that these are the only services nor that their indicated position is entirely accurate. Such information is given as a guide only and does not negate the above responsibility. All excavation in the vicinity of other services must be undertaken by hand.

22.7 Compaction

Particular care shall be taken in compacting pole holes, trenches crossing roads and those crossing or running under or within 1,0m of paved or tarred sidewalks. In trenches, the backfill shall be replaced in 150mm layers and four to six passes with a vibrating pan compactor shall be made per layer. Around poles, a jumping jack shall be used on each 150mm layer.

When clay is encountered, the Engineer should be advised and may instruct the Contractor to remove all such excavated material and replace it with more suitable material, which shall then be compacted as above. Where material is too wet for proper compaction, it should be dried out and if too dry, shall be dampened. When rain is likely to occur, all excavated material shall be suitably protected to prevent the necessity for later drying out.

In the case of road crossings, the excavated base and sub-base material shall be mixed and replaced up to the top level of the original sub-base, New material equal in composition to the original base course shall be supplied, this material being used for the full depth of the base course layer.

The degree of compaction required shall be field densities of 95% in respect of poles and road crossings and 90% in respect of sidewalks, of the Modified AASHO density, as measured by the Sand Replacement Method described in the "Standard Method of Testing Materials" issued by the Division of National Roads, Department of Transport, Private Bag 193, Pretoria.

The Engineer will, if the compaction is in doubt, arrange to have it independently tested and should the compaction prove to be below standard, the cost of the test will be debited to the Contractor, who will be required, at his own expense, to open and re-fill the trench or pole hole to obtain the specified compaction value.

In all other areas, backfill shall be replaced in 150mm layers and shall be hand tamped, the remaining material being heaped over the trench for later settlement.

23. SLEEVES

Sleeves for cables shall be either PVC with single socket joints complying with SABS 791 (heavy duty) or fibre cement complying with SABS 1223 in the case of 50mm and 100mm sleeves (in compliance with SABS 0198: Part VIII) or with SABS 819 for larger sleeves, the sizes being as indicated on the drawings. Sleeves shall be nominal 100mm diameter unless otherwise specified. Pitch fibre sleeves shall NOT be used.

The sleeves shall extend at least 1,0m beyond each side of a road crossing and shall be effectively sealed at the ends. Each sleeve shall be provided with a draw-wire. At least one spare sleeve shall be provided at each crossing.

All sleeves shall be laid in accordance with SABS 1200 (LC) and at a depth of 900mm unless otherwise indicated. The radius of the bends used in the sleeves shall not be less than six times the diameter of the sleeve, and the sleeve is not less than twice the cable diameter unless otherwise specified.

Sleeves shall be laid on a 100mm compacted layer of selected bedding material or, if this is not available, on a 100mm sand bedding. The cover layer shall be hand compacted completely around the sleeves and to a cover of 150mm above the top of them. The sleeves shall be supported along their entire length by the bedding. A further 100mm layer of selected bedding material shall be added, and this shall be compacted using four to six passes of a vibration pan compactor. Thereafter, the trench shall be back-filled and compacted as specified in the sub-Clause "Compaction" elsewhere in this Part.

Both ends of all sleeved crossings shall be marked by means of cable markers as elsewhere specified, labelled "cable sleeve".

The Contractor shall make all necessary arrangements with the appropriate Authorities for closing sidewalks and/or half the roadway at a time, and he shall comply fully with any statutory requirement applicable and any requirements the Authorities deem necessary. The surfaces shall be made good to the satisfaction of the authorities and the Engineer, but where tarring or paving is to be laid or re-laid, this shall not be done until the Engineer has given the necessary approval.

Where the HV or main LV cables cross over or pass under other services such as water or drainpipes, they shall be run in sleeves. Where these crossings present a particular hazard to the cable, the Contractor shall draw the attention of the Engineer to any such crossing requiring special attention.

All sleeves for Telkom cables will be 110mm diameter pitch fibre similar to Santar, supplied by the Regional Engineer, unless otherwise specified. These sleeves are to be laid under this Contract and must be kept at a minimum of 0,6m horizontally from and 0,3m vertically above any power cable sleeve. They are to be laid at a depth of 800mm and one end is to be provided with a marker labelled "Telkom".

24. CABLES

24.1 24.1 Description

PVC insulated cables for LV shall be to SABS 1507 and shall consist of PVC insulated conductors, PVC bedding, galvanized steel wire armouring and PVC sheath.

The abbreviation for this type of cable is PVCAS.

Paper insulated cables shall, unless otherwise specified elsewhere in this Specification, be of the screened type suitable for use on an earthed system and complying with SABS 97. They shall be lead sheathed, bedded with two bituminised paper tapes and one layer of fibrous material and preferably armoured with two layers of steel tape or alternatively with a single layer of galvanized steel wires, both served with bituminised fibrous material. Such cables shall comply with Table 19 of SABS 97 and shall be non-draining. They shall have a sheath of lead alloy 'E' and/or be PVC served only if called for elsewhere in this Specification.

The abbreviation for this type of cable is PILCA

Cross-linked polyethylene cables shall be Type A suitable for use on an earthed system and complying with SABS 1339, being individually screened and armoured, unless otherwise called for elsewhere in this specification.

The abbreviation for this type of cable is XLPE

Service cables may be multicore PVC insulated and wire armoured, and PVC served (PVCAS), concentric neutral or "Airdac" as specified elsewhere in this Specification.

Concentric neutral cables shall be XLPE insulated complying with SABS 1268. "Airdac" cables shall be XLPE insulated with copper conductors, the phase conductor being contained within a radial band of insulated neutral and bare earth conductors, the whole being XLPE served. All cables are to be installed in compliance with the Manufacturer's recommendations.

The sizes indicated are for cables with copper conductors unless otherwise specified. For LV systems aluminium conductor cables may be offered as an alternative if a price advantage can be shown. In such cases both the resistance and current carrying capacity of the aluminium cables offered must compare suitably with the sizes of copper conductor indicated. Where cables offered are other than those specified, Scheduled Rates for the supplying, laying, jointing and termination of the cable shall be entered in "Departures from the Specification".

The Contractor will be responsible for advising equipment suppliers of the type of cable termination required if a cable other than that specified is accepted.

24.2 Cable Lengths

All scheduled cable lengths are for tendering purposes only and the Contractor shall measure the actual lengths required before ordering.

The length of all cables will be re-measured after installation and the lengths indicated in the Bill Schedule of Quantities will be adjusted accordingly. The Contractor will be paid for the actual lengths measured on site and any allowance for snaking, joints or ends must be incorporated in the unit price.

24.3 Handling of Cables

Particular care shall be taken in handling drums of cable. Cable drums shall not be dropped or allowed to roll unchecked. The drums shall, under no circumstances, be rolled in any direction other than that indicated by arrows thereon.

When running cable off a drum it shall be properly and securely mounted so as to rotate without difficulty and the spindle supporting it shall be straight, horizontal, supported at both ends and of adequate strength. Cable shall only be removed from the drum by rotating the drum. The inner end of the cable shall be released before running any cable off the drum.

Care is to be taken to ensure that each length of cable is run off the drum sequentially so that a crossed core situation does not arise at joints.

No cable shall be bent to a radius less than 12 times the overall diameter of the cable, Bending or straightening shall be done slowly. PILCA cable shall not be laid if the temperature falls below 10°C.

Should a cable inadvertently become damaged, or the lead sheath or end cap punctured, this fact shall be brought to the notice of the Engineer immediately, who shall decide what further action is to be taken. The Engineer shall also be notified immediately should there be any suspicion of moisture having entered a PILCA or XPLE cable.

24.4 Cables fixed to Surface

Where cables enter flush boards from cable sleeves, the sleeve shall turn up to floor level and a duct shall be forced in the wall to accommodate the cable.

Care shall be taken to ensure that the bending tolerance of the cable is not exceeded in drawing the cable into the sleeve. The duct shall be of sufficient size to accommodate the cables.

The edges of the duct are to be lined with timber battens to which a bevel edged metal cover is to be screwed, using countersunk headed screws and cup washers.

Wherever cable saddles or any other items are to be fixed to structural components, the use of dry plugs of wood will not be permitted. 'Rawl plugs' or other plugs to approval only shall be used. Surface mounted cable protection pipes shall be galvanized and shall be fixed with saddles of 32mm x 3mm galvanized strap bolted to the wall using bolts grouted in, 'Rawl bolts' or similar.

All cables rising on the outside of buildings or on poles shall be protected by such pipes to a height of 2,0m above ground level. Where a cable is installed fixed to a pole, it shall be attached to the pole using stainless steel "Bandit" strap or equal. Care shall be taken to ensure that the straps are tightened correctly and that they do not distort or indent the cable sheath.

24.5 Cables laid in Trenches

HV cables shall generally be laid 1000mm and LV cables at 600mm below ground level. Where two HV cables are run in the same trench, they shall be laid a minimum of 300mm apart with separate cable slabs over each cable. Where HV and LV cables are laid in the same trench, the HV cable shall be located on the roadside and the LV cables on the plot side of the trench. A horizontal distance of not less than 400mm shall be maintained between the cables of different voltage groups. Where a number of LV cables are run in the same trench, they shall be laid with a minimum separation of 100mm. This applies to feeder cables only and not street lighting and service cables which shall be only 25mm apart. Cables shall not cross each other.

Where cables run across even parallel to lateral boundaries, they shall be located 1,0m from the boundary at a depth of 1,0m. If so specified they shall be run in sleeves, otherwise both HV and LV cables shall be protected by cable slabs and a PVC sheet marker laid 300mm, above them.

The trench bottom shall be cleared of all sharp or protruding stones. The trench is then to be refilled with 150mm of soft material and compacted. A further layer of soft material shall be installed after the cables are laid to provide 200mm cover for the cable when compacted. Protective cable slabs a minimum of 50mm thick x 230mm wide shall then be laid in the case of HV cables, and PVC sheet cable marker strip 450mm wide with indelibly printed warnings every 150mm along its length, in the case of LV cables. In cases where HV and LV cables run in the same trench, 100mm of soft bedding for the LV cables shall be situated above the protective cable slabs. Where LV service cables or street lighting cables only are installed, a clean trench bottom and soft material back-fill only is required, and no PVC sheet marker.

The soft material described above may be either sand or back-fill material sifted through a 3,0mm mesh grid. Where the bottom of the trench consists of only soft sandy material, the bedding underneath the cable shall be omitted and the cable shall be laid on the trench bottom at the correct depth. Permission must be obtained from the Clerk of Works or the Engineer for the cable bedding to be omitted in such instances. Where sand has to be brought to site, the quantity must be measured and confirmed by the Engineer or Clerk of Works.

The balance of the trench is to be back-filled with excavated material from which all stones, etc. greater than 100mm in size have been extracted. All such extracted material is to be removed from site.

Cable route markers shall be provided for all HV and main LV feeder cables at road, culvert and Telkom cable crossings, at all changes of direction, at joints and at intervals not exceeding 60 metres along the straight. Cable route markers shall comprise concrete blocks in the shape of truncated pyramids 300mm high, 150mm x 150mm at the top and 225mm x 225mm at the base. An aluminium plate 3,0mm thick minimum, with four rods 75mm minimum welded to it on the underside, shall be cast into the top of the concrete block, and the plate shall have stamped on it the cable data and direction arrows, and at a crossing, the crossing shall be indicated.

The cable route markers shall be placed over the cable, in the trench way, and shall protrude 25mm above the finished ground level but not where they are likely to cause an obstruction or be in the way of moving traffic. Joint markers shall indicate as such. The Contractor shall ensure that the ground under and around the cable marker is properly compacted.

24.6 Laying of Cables with other Services

Where cables are laid in trenches containing water and other pipes, etc., the Contractor shall arrange with the Civil Engineering Contractor and Engineer, to lay the electrical cables along one edge of the trench with the other services occupying the other edge. The cables shall be laid not less than 600mm from such service unless otherwise approved by the Engineer.

At road and services crossings, sleeves as described elsewhere herein shall be provided, one for each HV cable and a separate sleeve for other cables, unless otherwise indicated on the drawings.

At Telkom cable crossings, power cables shall cross 300mm below and at right angles to all such cables or sleeves for future cables. The power cables shall be enclosed in asbestos cement split sleeves with cable slabs over, both of which shall extend 1,0m either side of the crossing. The two sections shall be firmly fastened together with robust stainless-steel straps. The full length of all such sleeves shall be covered by cable slabs installed 150mm above the sleeve. No power cable running parallel with a Telkom cable shall be laid within a distance of 1,0m measured horizontally from the Telkom cable. Wherever existing buried Telkom cables are encountered, strict precautions and care shall be taken and close supervision given. Any damage to, or disturbance of Telkom cables whatsoever shall be immediately reported and confirmed in writing to the Engineer.

24.7 Labelling of Cables

All cables shall be labelled with 3mm high letters punched onto aluminium tape attached to the cable with aluminium wire. The label shall state the cable size and number of cores. All main feeder cables shall also be labelled to state from whence they are supplied. The labels shall be so installed that they are easily readable.

25. CABLE TRAYS

These consist of two basic types, i.e. perforated and folded or wire mesh comprising Light, Medium and Heavy Duty. The actual type and duty required, and the finish if not as set out below, is specified elsewhere in this Specification.

Perforated and folded trays:

Light duty tray shall be manufactured from pre-galvanized perforated sheet steel. The minimum material thickness shall be 1,0mm for tray widths not exceeding 150mm and 1,2mm for widths not exceeding 300mm. Turned-up edges shall not be less than 12mm for tray widths not exceeding 230mm and 20mm for widths not exceeding 300mm. Maximum spacing between supports shall be 1000mm.

Medium duty "Standard" or "Marine" tray shall be manufactured from 1,2mm thickness perforated sheet steel with turned-up edges of not less than 12mm for tray widths not exceeding 100mm, and 19mm for tray widths not exceeding 600mm.

The tray shall be hot dip galvanized after manufacture. Maximum spacing between supports shall be 1200mm.

Heavy duty "Heavy Duty" tray shall be manufactured from 2,5mm thickness perforated sheet steel and shall have turned-up edges of not less than 75mm. The tray shall be hot dip galvanized after manufacture. Maximum spacing between supports shall be 2400mm.

Welded wire mesh:

Medium duty tray shall be manufactured from 4,0mm wire and shall have turned-up edges of not less than 50mm. The tray shall be hot dip galvanized after manufacture. Maximum spacing between supports shall be 1500mm.

Heavy duty tray shall be manufactured from 4,0mm wire and shall have turned-up edges of not less than 75mm. The tray shall be hot dip galvanized after manufacture. Maximum spacing between supports shall be 1500mm

Splicing pieces, bends and tee pieces shall be provided to suit the cable tray system. These shall be of an approved make conforming to the width and quality specification of the particular cable tray being used.

Trays are to be installed in accordance with the Manufacturer's recommendations, supported in such a way that they are carried on cross members cantilevered from a vertical support so that cables do not have to be threaded between the supports. Trays on walls are either to be carried horizontally on right angled brackets or fixed vertically to the wall. All hardware, support brackets, etc., shall be hot-dip galvanized. Support brackets shall be spaced so that a sag of 1/200 is not exceeded with the tray fully loaded. Further, the maximum spacing limit specified above shall not be exceeded.

Where trays are likely to be damaged because of their proximity to a working area and could therefore be stepped on or similar abused, they are, if at all possible, to be installed out of the way of such abuse. Where this is not possible, only heavy duty tray is to be used and additional longitudinal support in the way of angle iron of suitable size is to be installed.

Where the width of cable trays is unspecified elsewhere in this Specification, they shall be sized to accommodate 20% more cables than the number presently to be installed on the basis that the future cables will be of the same average size.

Unless otherwise specified, all cables over 16mm² are to be spaced at least 12mm apart. Where cables are laid flat on trays, fixing is required for all cables larger than 16mm² using heavy duty nylon cable ties.

Where fixed in the vertical plane, all cables are to be strapped to the trays using stainless steel strapping applied with an approved tool. This also applies to single cables fixed to trusses or other parts of the structure and to all cables fixed to cable trays in a physically vulnerable situation.

26. CABLE JOINTS AND TERMINATIONS

26.1 General

Cable jointing and termination shall be carried out by a qualified cable joiner using only approved standard methods for the particular type of cable. Proof of his training may be required.

Joints in all cables shall only be made at full drum length intervals, but where necessary and when approved by the Engineer cable through joints may be used in other approved positions.

Where a cable has steel wire armouring all strands of armouring shall be through jointed.

Cable connections shall be made by means of crimped or sweated lugs, firmly bolted, one plain and one lock washer being placed under the nut, so that the plain washer is against the lug and there shall be no washer between the lug and the terminal. A plain washer is also required under the bolt head. Alternatively, sweated stems fitting into clamp connections will be acceptable.

Crimped lugs up to 70mm² shall be fitted using manual tools and hydraulic tools from this size upwards. Approved tools are to be used in both cases. An hydraulic tool is to be used on all sizes of aluminium cable. Where a single point hydraulic crimping tool is used, the lug shall be crimped in three places. Where a hexagonal die is used, this shall extend the full length of the lug.

Where aluminium cored cables are to be connected to circuit breakers, the aluminium cable lug shall be bolted to a copper tag or tail which is to be connected to the circuit breaker. The Contractor shall ensure that sufficient Denzel paste is installed on the faces of the lugs.

Where an aluminium cable is to connect to copper, the lug shall be a bi-metal type lug with a copper spade and an aluminium ferrule friction welded to the spade.

Cable connections shall be made using brass bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels and mini-sub's and with cadmium plated steel bolts and nuts on all indoor equipment. All bolted joints shall be taped with self-vulcanising (not adhesive) tape.

Where cable connections are required to the HV and LV terminals of transformers, these shall be made off as follows:-

- Red Phase to Terminal A
- White Phase to Terminal B
- Blue Phase to Terminal C

All transformer connections shall be kept in strict phase rotation and where two or more units are to operate in parallel, the respective connections are to be checked for phase rotation and polarity. In the case of cable terminations to transformer bushings the cable itself shall be clamped substantially to a post adjacent to the transformer, connections to the bushings being puttied and taped.

All connections are to be colour coded.

26.2 LV Cable Terminations

PVCAS cables shall be made off using adjustable mechanical glands.

Care shall be taken to ensure that armour wires are correctly seated in the gland and that all parts are properly tightened. Outdoors, in damp situations and in all mini-sub's and kiosks, neoprene waterproofing shrouds are to be fitted over all glands.

Where cable connections from mini-sub's and kiosks to consumers and street lighting are excluded from this Contract, the Contractor shall, nevertheless, ensure that sufficient space is left on the gland plate for the future cables.

Wherever PVCAS cables are terminated to overhead lines a suitable moulded heat shrinkable glove to affect a watertight seal at the crotch shall be used, in accordance with the manufacturer's instructions. Alternatively, a PVC cable cap may be used.

27. CABLES FOR EARTHED SYSTEMS

(Based on SABS 97 : Table A-2)

Type	PVCAS**	BELTED		SCREENED		XLPE**	
		11000	22000	11000	22000	11000	22000
Rated voltage	600/1000	11000	22000	11000	22000	11000	22000
Between conductors - DC	3kV	31kV	60kV	-	-	18kV	36kV
Conductors to screen - DC	-	-	-	19kV	36kV	18kV	36kV
Conductors to earth - DC	3kV	19kV	35kV	19kV	36kV	18kV	36kV

** Test only when specifically called for

** Obtain instructions from the Engineer before testing

28. SITE LIGHTING

28.1 General

Site lighting poles and luminaries to be installed under this Contract, including the type, mounting height, outreach dimensions, quantities, etc., are detailed elsewhere in this Specification.

All poles offered shall conform in all respects to the requirements of the Occupational Health and Safety Act where applicable and to SABS 0225, Code of Practice for the Design and Construction of Lighting Masts. In particular they shall comply with the requirements regarding design wind loadings and factors of safety.

Poles shall have neat flush access openings with the bottom of the opening 350mm above ground level. The opening shall have radius corners and shall be adequately sized to facilitate installation of the specified electrical equipment. The minimum size shall be 140mm x 355mm unless otherwise specified.

The opening shall be provided with a neat flush weather-proof door fitted with a tamper proof locking device designed to secure the door firmly in position and prevent unauthorised access into the base compartment.

A minimum of four access door keys shall be supplied to the Employer on completion of the installation. A receipt shall be obtained from the Employer for these keys and a copy of this receipt shall be submitted to the Engineer with the final progress claim.

A hardwood fixing block shall be fitted within the base compartment. The dimensions of this block shall not be less than 380mm x 125mm x 25mm thick.

A threaded 12mm earth stud shall be provided in a convenient position in the base compartment to facilitate earthing of electrical equipment.

Baseplates shall be provided for all poles. These shall be a minimum of 610mm x 610mm x 6mm thick and shall be provided with drain holes. Baseplates shall be bolted in position by means of a minimum of 2 x 20mm diameter hook bolts.

Spigots shall be provided to suit the luminaries specified elsewhere in this Specification. Particular care shall be taken to establish the exact diameter and length of the spigot or spigots required such that the luminaire fits neatly up against the shoulder formed between the pole and the spigot. Care shall be taken to avoid damage to the spigots during transport, storage and erection.

28.2 Erection of Poles

Poles shall be planted in the positions indicated on the drawings. They shall be planted absolutely plumb with the outreach at right angles to the carriageway edge, where applicable.

Should any pole position coincide with trees, building canopies, driveway entrances, overhead conductors or other obstacles, an alternative position is to be confirmed with the Engineer before excavation of the pole hole.

Where poles line a road they shall be carefully aligned with each other to form straight lines or smooth curves generally following the alignment of the associated roads. The planting depth shall be carefully controlled to ensure that all luminaries will be at the same height above the level of the carriageway.

Care shall be taken when backfilling around the pole to ensure that compaction is even all around the pole and is to the requirements specified in the sub-Clause "Compaction" elsewhere in this Part. Where poles are to be planted in fill material, on ramps, etc., one pocket of dry cement shall be mixed with the backfill material before commencing backfilling and compaction.

Subject to the prior approval of the Engineer, this technique shall also be applied wherever it is considered necessary to stabilise the pole due to unsuitable soils, etc. Where the Contractor feels that this situation exists, he must advise the Engineer immediately and obtain a decision.

28.3 Luminaries

The types and wastage of the luminaries required are detailed elsewhere in this Specification. The lighting design has been based on the photometric performance of the specified luminaries and the tender price must be based on the supply of these luminaries.

Alternative offers based on the use of luminaries other than those specified may be submitted in accordance with the requirements of the Clause "Alternative Offers" in Section A of this Part.

Such offers must, however, be accompanied by a complete set of photometric data on the luminaries offered, comprehensive details of the construction of the luminaries and a complete set of design calculations based on the requirements of SABS 098.

Unless otherwise stated, the luminaries are to be provided with tapped ballasts and power factor correction capacitors. It will be stated elsewhere in this Specification whether control gear is to be integral with the luminaire or remote mounted in the pole base compartment.

Where control gear is to be mounted in the pole base compartment, it shall be the Contractor's responsibility to ensure that the dimensions of the base compartment and access opening are adequate, notwithstanding the minimum dimensions specified herein.

28.4 Electrical Connections

No cable glands or gland plates are required for the termination of PVCAS cables in site lighting poles. The cable shall be brought up to a convenient position adjacent to the lower section of the access opening. The outer PVC sheath shall be stripped back and the steel wire armouring pulled away from around the cables, twisted into compact tails and bonded together by means of an adequately sized line tap.

A separate earth conductor shall be taken from this line tap to the earth stud in the pole base compartment. Phase and neutral conductors shall be jointed using shrouded line taps and the cables neatly secured to the bottom of the hardwood fixing block by means of saddles.

Unless otherwise specified elsewhere in this Specification, the phase conductor to the luminaire control gear shall be protected by a CBI type "STI", 20A streetlight MCB attached to the hardwood block.

Where luminaire control gear is to be mounted in the pole base compartment, it shall be firmly secured to the hardwood block above the MCB. The earth stud on the control gear housing shall be connected to the earth stud in the pole base compartment.

Phase and neutral conductors between the pole base and luminaries shall be 1,5mm² PVC insulated for luminaries up to 400W and 2,5mm² PVC insulated above this rating.

The phase to which each luminaire is to be connected may be indicated on the drawings. It is essential that this arrangement is strictly adhered to.

28.5 Photo-electric Controls

Where called for elsewhere in this Specification, a photo-electric control unit shall be used to switch the site lighting installation. Photo-electric switches shall be of the type comprising a photo-sensitive resistor, thermal actuator with an inherent operating delay to make it insensitive to short duration changes in light levels and a change-over switch mechanism, all housed within a tough, translucent, weather and ultra-violet resistant cover. The operating level shall be factory pre-set to switch on at approximately 50 lux and off at approximately 100 lux. The response time after sudden changes in light level shall be not less than 15 seconds.

Integral protection against voltage surges shall be provided.

A suitable unit would be the "National" type ZS-20AR.

Where the photo-electric switch is pole mounted it shall be positioned in such a way that it will not be affected by spill-light from the site lighting installation or by vehicle headlamps, but where possible it should be mounted on a substation or at the rear of a mini-sub.

28.6 Completion and Testing

Immediately after completion of the installation, the site lighting system shall be switched on and lamps allowed to stabilise for at least one hour. Any faulty lamps shall be replaced. The voltage at each luminaire shall be measured and toppings on the ballasts set accordingly.

28.7 Guarantees and Maintenance

The installation shall be guaranteed, and maintenance carried out in accordance with the requirements detailed elsewhere in this Specification except that, where no other defects or maintenance procedures requiring the Contractor's attention exist, the installation of replacement lamps supplied by the Contractor will be carried out by the Employer's maintenance personnel, unless otherwise specified elsewhere herein. Under no circumstances is any spare equipment or lamps elsewhere specified to be used for replacement during the foregoing period.

29. WIRING IN CONDUIT

PVC insulated wire to SABS 1507 and 1574 shall be used and shall be from full coils of fresh stocks delivered to site with the original packing or seals undisturbed.

Lighting circuits shall be wired with 1,5mm², socket outlet circuits with 2,5mm² and heater and water heater circuits with 4mm² wire unless otherwise specified. All other circuits shall be wired with the sizes indicated or in accordance with the Wiring Code, as appropriate. All phase conductors shall be coloured red and neutral conductors black.

The ends of all wires, whether single or looped, which have to be connected to the connecting terminals of switches, plugs, holders, fittings and distribution boards, are to be tightly twisted together. Cutting away the wire strands will not be allowed.

The loop-in system is to be adopted throughout any conduit installation and joints will be permitted only in special circumstances and subject to the approval of the Engineer. Such joints shall be made only with approved connectors in approved boxes.

The circuit wiring for different services, e.g. lighting and power, shall be run in separate conduits.

Where switches fed from different phases are mounted adjacent, they must be mounted in separate boxes or a single box with a fixed metal barrier between each switch. Where such switches are on the same circuit, multiple switches in a single box shall be used.

Metal conduit shall be heavy gauge solid lap welded steel to SABS 1065, screwed or plain-end and black enamelled or galvanized, both as specified elsewhere in this Specification.

All metallic conduit shall be manufactured from mild-steel with a minimum thickness of 1,6mm in respect of screwed and 0,9mm for plain-end conduit except that when used in concrete slabs, plain-end conduit shall have a minimum wall thickness of 1,2mm and when laid in screed on top of concrete slabs, 1,6mm.

Non-metallic conduit shall comply with to SABS 950. Installation of non-metallic conduit shall be in accordance with Amendment No.2 of SABS 950 Appendix C. Only plastic saddles and compatible fittings shall be used. Earth wires shall be installed with all non-metallic conduits.

All conduit fittings for steel conduit shall be malleable iron or pressed steel except for brass bushes. Plastic fittings shall be used with non-metallic conduit. Conduit fittings shall comply with SABS 950 or 1065 as appropriate. The use of inspection tees or elbow pieces and internally screwed solid bends will not be permitted. However, internally screwed solid bends for 40mm and 50mm dia. conduit may be accepted in certain circumstances if approved by the Engineer.

All conduit shall, wherever possible, be concealed by being cast in concrete slabs, chased in, built in or run in roof spaces. Where black enamel conduit is called for, this shall be substituted with galvanized when run in non-suspended floor slabs such as ground floor or basement floor slabs. When run in surface beds conduit is to be galvanized and is to be laid in concrete on the surface bed so that it is completely covered.

Conduit cast in concrete shall be fixed at intervals to the form work, if such form work is of wood or, if of steel plates, to the steel reinforcing. Where hollow tile slabs are being used in the structure, as indicated elsewhere in this Specification, back entry conduit boxes shall be used. All outlet boxes for lighting points shall be of the long spout, deep type. Where additional depth of box is required, standard conduit box extension rings, firmly screwed to the box, shall be used.

Where structural expansion joints occur, conduits shall, as far as possible, be laid to avoid crossing the joint. When crossings are unavoidable, the following arrangement shall be made, from a drawbox, or the nearest outlet within 4,0m of the joint, conduit of one size larger than necessary for the wire sizes, shall be run straight, and at right angles to the joint, finishing at the joint. Conduit of the required size shall then be passed into this from the other side of the joint, bushed inside the draw-box, but not mechanically connected otherwise. Care shall be taken to prevent concrete from entering the end of the larger conduit.

The conduits approaching from both sides of the expansion joint shall be wrapped with two layers of corrugated cardboard from a point 1,0m from the joint. A bare earth wire of the same size as the wiring in the conduit shall be run from the drawbox to the next outlet, connecting firmly and solidly to each box.

Care shall be taken to exclude the ingress of dirt or moisture to partially completed runs, and all open ends shall be plugged temporarily while work is not actually in progress. The plug may consist of a conduit socket with brass ET plug or conduit fishtail, or purpose made tightly fitting plastic sealing caps. Wooden or paper plugs will not be acceptable.

The Contractor shall take all possible precautions during the construction Stages of the building to prevent damage to projecting conduits, etc. In vulnerable positions projecting conduits shall be painted in a bright colour or, if necessary, shielded by a large covering.

A responsible workman shall be present at all times during casting of concrete containing conduit work to ensure that the conduit work is not disturbed by the casting or vibration of the concrete.

Conduit in false ceiling spaces shall be run surface. The conduit into the space shall either extend through the decking or shall be terminated in a back entry box with a coupling inside the box to enable the conduit to be extended when shuttering is removed.

In roof spaces all conduit runs shall be parallel or at right angles to trusses and joists. Where conduits run along trusses and joists they shall not be run or fixed on the top but on the side. Conduit shall lead into and out of back entry conduit boxes at all fitting positions. All such boxes shall be finished flush with the underside of the ceiling and the lighting fittings shall be screwed directly onto the box. Where necessary, an additional fitting and conduit box shall be provided.

At ceiling positions where conduit runs do not have to continue to the next truss (e.g. last point in a row), the conduit shall be extended beyond the box to the next truss. This conduit extension shall be plugged.

Where conduit is run on the surface, it shall be fixed with stand-off saddles; multiple spacer saddles being used for conduits run together, the maximum distance between the saddles shall not exceed 1,5m. Where a conduit box carries lighting fittings it shall be fixed within 100mm on either side of the box.

Where conduits have to run adjacent to gas or cold water pipes, communication or data circuits, they shall be prevented by spacing or other means from coming into contact with these other services under any condition.

Under canopies, outlets for future signs, etc., which have been terminated in round conduit boxes, are to be blanked off with 75mm dia. galvanized cover plates finished with a zinc plum bate primer. These are to be fitted prior to painting and are to be fixed using cheese-headed brass machine screws.

Where conduit enters boards, trays, etc., all burrs around holes shall be removed before insertion. Locknuts shall be used inside and outside, with female bushes inside. Couplings and male bushes shall not be used. The same arrangement shall be used wherever possible for entry into switch boxes, control gear, etc., provided with clearance holes.

Where this arrangement does not allow sufficient wiring space, however, couplings and hexagonal male bushes may be used, but must be very tightly screwed up. In the case of multiple back entries into a conduit box, male bushes and couplings are to be used. Care must be exercised when laying conduit in the vicinity of distribution boards of any type to ensure that conduits radiate from these points in order.

Under no circumstances are more than two conduits to cross at any point where cast in concrete and a space of at least 20mm must be left between all conduits both vertically and horizontally after emerging from the distribution point. Careful planning of conduit work can prevent a mass of conduit in the slab, and any re-arrangement necessary to provide an acceptable layout will be at the Contractor's own expense.

Drops to switch and other high level outlets shall be from ceiling while conduit to low level outlets shall be run in the floor unless specified to the contrary. In basements and ground floor areas which are below natural ground level, all conduits to any type of outlet shall drop from ceiling level.

No draw boxes which are not, in themselves, outlets shall be permitted except with authority from the Engineer.

Notwithstanding the Wiring Code, if it proves necessary to draw conductors round more than two 90° bends, or the equivalent, or on very long straight runs, draw boxes are required. The maximum length of straight runs between draw boxes shall not exceed 20m. Such draw boxes shall be provided with oversize flat covers fitted flush with the ceiling, fixed with cheese-headed screws.

The Contractor is responsible for checking with the Building Contractor by reference to the drawings on site, of the positions where panelling, tiling, tile edging or dados, etc., may affect the exact positioning of outlets. No allowance for extras will be allowed if boxes have to be moved to comply with the above unless the details are altered after completion of the conduit work. Exact positioning in general means centre outlets on panels, fitting box edges to tile edges, and dropping or raising switch points below or above dados as close to the specified position as possible. Where any doubt

arises the Engineer shall be consulted before installation of the outlet. The same requirement applies to the positioning of lighting outlets in false ceilings, with particular regard to fixing fittings to correspond to ceiling panel modules.

Ceiling light points are normally either on a centreline between walls and/or beams or spaced evenly with half a unit between wall or beam and the first point. Where outlet positions deviate from this scheme the scaled dimensions to the centre of the symbol are to be taken as the centre of the outlet.

All setting of conduit shall be done with approved tools. No kinks will be accepted. Where necessary, boxes with special configurations shall be used to avoid the necessity for too many sets in conduit work.

The conduit shall be run or erected as far as possible in straight or symmetrical lines, with easy sets or bends. Care shall be taken when installing conduit that cut ends are completely free from burrs and sharp edges which might damage the conductors. All open ends shall be fitted with brass bushes. Composition bushes will not be accepted. All bushes are to be fitted prior to wiring. All running joints shall be fitted with lock-nuts, and lock-nuts shall be provided wherever necessary to ensure that all conduit joints in the installation are tight.

Where flexible conduit connections are required, only "Kopex" or "Adapterflex" flexible conduit or similar approved shall be used. "Sprague" conduit will not be accepted.

Where conduit only is required, draw-wires shall be left in each such conduit, irrespective of the service for which it is required. Draw-wires shall be minimum 1,6mm dia. hot dipped galvanized steel.

Conduit run on the surface within ducts shall be painted an approved colour under this Contract. Conduit in false ceilings and roof spaces is not to be painted, except as hereunder. Painting shall be carried out by a qualified painter. Any exposed screw threads or areas where the galvanising or enamel has been damaged shall be painted after erection with two coats of anti-corrosive paint, and, where installed in concrete, before casting, unless otherwise approved by the Engineer.

The Contractor must ensure that, prior to final completion, all openings left at the conduit exit from switch rooms or between floors in rising ducts, are made good.

30. WIRING TRUNKING

This shall be used where indicated elsewhere in this Specification and shall be of the type specified. Where trunking is to be fabricated of sheet metal, this shall be of 1,0mm minimum thickness. Each length shall be so constructed that it matches identically with the other lengths and the lengths shall be joined by splicing sections inside the trunking. All trunking shall be provided with covers of the type and material elsewhere specified in this Specification.

All trunking shall be finished by degreasing, suitably primed and painted with two coats of high quality enamel, unless otherwise specified. Where galvanising is specified, this shall mean fabrication from pre-galvanized plate unless hot-dip galvanising is specifically called for. Electro-galvanising will not be accepted.

"Unistrut" or equivalent trunking shall be provided to the catalogue number indicated, otherwise shall be of appropriate size for the purpose. The standard cover shall be of PVC of a colour to match the trunking. Other types of cover required will be specified elsewhere in this Specification.

All trunking shall be installed straight and level and shall incorporate all recommended fixings when of proprietary makes. Plastic clips shall be installed at not more than 1200mm centres to hold wiring in place when covers are removed.

Earth wires shall be run in all wiring trunking and these shall be bonded to all equipment fed by wiring carried in the trucking and to the trucking lengths themselves.

When trunking is cast into structures it shall be taped to prevent the ingress of slurry and it will be the Contractor's responsibility to ensure that the trunking runs true. Where trunking is fitted to pre-formed slots in the structure or built into brickwork, the trunking shall be adequately braced to prevent deformation of the sides during plastering, resulting in the bowing of the cover when finally fitted.

Where light fittings cross ceiling trunking, the cover strip shall be cut square to abutted the fittings, and the raw edges, if of metal, shall be painted to match the applied finish.

Skirting trunking shall be as specified elsewhere in this Specification, the general remarks above being deemed to apply.

31. BUSBAR TRUNKING

Bus-bar trunking for LV systems shall comply with SABS 784 and shall consist of metal-enclosed copper or aluminium bus-bars intended for use indoors at voltages not greater than 1000V.

Bus-bars shall be spaced apart and held in position by robust insulating material and shall be sufficiently strong to withstand the rated fault level without failure, all in accordance with the abovementioned SABS Specification.

The metal enclosure around the bus-bars shall be sheet metal of sufficient thickness to provide adequate rigidity and strength under fault conditions. The metal enclosure shall be treated adequately against corrosion by means of hot-dip galvanizing or enamel coatings in accordance with SABS 784. Ventilation openings shall comply with IP 3Q and with the vermin proofing requirements set out in the Particular Specification.

Bus-bar trunking systems shall be installed strictly in accordance with the manufacturer's instructions and the relevant provisions of SABS 0142.

No protective devices shall be provided within the bus-bar trunking system (except as described in SABS 784) and outgoing circuits or tee-offs shall be adequately protected from over current by fuses or circuit breakers.

Expansion joints shall be purpose made and shall be installed at such intervals as recommended by the manufacturer.

Fire-resistant barriers shall be purpose made and shall be installed where bus-bar trunking passes through walls and floors and shall be installed strictly in accordance with the manufacturer's instructions. The opening through the wall/floor around the fire-resistant unit shall be fire stopped with non-combustible/fire-retardant foam in compliance with the National Building Regulations SABS 0400.

32. MICC CABLE

MICC cable shall be installed and terminated by persons experienced in the use of this type of cable. The Engineer shall have the right to call for a demonstration to prove this experience if considered necessary.

Cable sizes shall be as specified or shown on the drawings, lighting circuits being in 1,5mm² and socket outlet circuits in 2,5mm² cable, unless specified to the contrary. Where no size is given, this shall comply with the appropriate table in the Wiring Regulations. Cable shall be 660 volt or 250-volt grade, as appropriate.

Cables shall not be bent to radii less than six times the diameter of the cable without prior consent of the Engineer. Where this consent is given, re-straightening of sharper bends will not be permitted.

All cable shall be free from kinks and dents and shall be run straightening and true. A straightening tool shall be used to prepare the cable. All cable shall be properly handled to prevent damage. All unsightly or un-workmanlike work will be rejected.

The cable shall be fixed with single or multiple heavy gauge copper saddles attached with brass screws at the following spacing. When run vertically the distance between saddles may be doubled. Plastic saddles will not be permitted. Where-PVC served cable is specified, plastic coated saddles are to be used for fixing.

The following are the maximum spacing acceptable but where neatness is of particular importance, the spacing are to be halved.

- Up to 6,6mm : 600mm
- From 6,7mm to 9,5mm : 900mm
- From 9,6mm to 12,7mm : 1 200mm
- From 12,8mm to 19mm : 1 500mm

- From 20mm upwards : 1 800mm

Where cables are run on cable trays, they shall be strapped to the tray at the above spacing. In the case of single core cables these shall be in circuit groups, in trefoil formation. Both ends of such runs shall be solidly bonded and earthed across the sheaths.

Where cables are to be buried underground the trench shall not be less than 600mm deep, and the cable shall be PVC served. The cable shall be laid in sand to a depth of 50mm, both above and below the cable, and if not in a sleeve, shall be covered with concrete slabs. The installation shall otherwise comply generally with the Clauses "Cables" and "Trenching, Excavation and Compaction" elsewhere herein.

Cables shall be terminated in screw-on type pot seals using general purpose plastic sealing compound suitable for temperatures up to 150°C, unless otherwise specified. Above 80°C a silicone bonded glass cap and PTFE sleeving is to be used. The seals shall be fitted in accordance with the manufacturer's instructions using recommended crimping and compression tools. The pot seals shall be fitted into matched glands.

All glands, which shall be of the ring type, and locknuts shall be effectively fitted and tightened to obtain satisfactory earth continuity. Serrated lock washers shall be used beneath the locknuts. All tails shall be phase coloured with neoprene sleeves prior to the final connections being made.

These sleeves are not to be pushed too far into the pot seal. Where PVC serving is specified, the area from which the serving is removed is to be taped from the served section back to the gland plate, including the gland, with half lapped adhesive PVC tape. A PVC shroud shall be fitted over the taped area of both sheath and gland. No through joints will be permitted.

After cutting cable all ends shall, if being left for any length of time, be temporarily re-sealed with pot seal compound. In plaster depth work all cable ends must be made prior to plastering.

When terminating at motors mounted on slide rails the cable shall be saddled to a point adjacent to the motor, where it shall be made off into a standard round conduit box, adequately supported. From a dome lid the motor shall be connected by PVC conductors and earth wire in "Kopex" flexible tubing as specified elsewhere in this Part, or alternatively with PVC AS cable and glands. Where motors are not provided with means of altering their position, they may be connected directly with the cable, formed into an unsupported loop of 150mm minimum diameter prior to the connection to minimize vibration.

Where cable emerges from the ground, or is installed in a vulnerable position, it is to be protected by hot dip galvanized channel iron sections saddled to the wall. These sections are to be 1400mm high and must not touch the cable. Where cable is to be installed through conduit sleeves, a single lap layer of PVC tape is to be applied to the cable over the length that will be enclosed by such sleeves.

All cabling is to be tested prior to being made alive. No cable is to be tested until 24 hours after fitting of pot seals. All cables and terminations are to have an insulation resistance of infinity when tested with a 500V instrument between conductors and earth.

Where failure of a cable results from the installation carried out with incorrect tools, bad workmanship or neglecting to carry out those tests specified, the whole length is to be replaced at the Contractor's expense and he will also be responsible for the cost of making good damage to the work of other trades that may result.

33. SWITCHES, SOCKET OUTLETS, PLUGS AND BOXES

Switches shall comply with SABS 163 and shall be reasonably silent in operation. They shall be of 16A rating unless otherwise specified. Socket outlets shall be to SABS 164. Samples of all switches and socket outlets shall be approved by the Engineer before installation.

Cover plates shall comply with SABS 1084. For flat type plate, minimum 1,6mm thick metal and for pressed shaped plates minimum 1,0mm shall be used, the thick plates being finished in white, unless otherwise specified elsewhere in this Specification. They shall be fixed perpendicularly, and the tops of groups of plates shall be level. Plates for multiple

switch positions shall be of the same style and type as for single switch positions. Samples of all plates are to be submitted before ordering.

Submersible (WT/S) switched socket outlets are to comprise "Ceeform" or approved equivalent surface mounted units complying with IP67 of the sizes elsewhere specified in this Specification so installed that the action of removing the plug does not dislodge the fixed portion. A minimum of two plugs shall be provided; any further plugs required being as elsewhere specified.

Watertight (WT) switch socket outlets are to be as for Submersible above, but to IP65.

Weather-proof (WP) socket outlets are to comprise a socket outlet with aluminium plate and non-ferrous screws set into a "York" model S15 fibreglass box with sliding cover.

Weather-proof (WP) switches are to be "Wallsall" square pattern flush type or "Lewden" No. PD 145.

Weather-proof and watertight switches and socket outlets are to be semi-recessed in a manner to be discussed with the Engineer to ensure their acceptable mounting, especially in the case of face brick walls.

Where industrial pattern switches or socket outlets are called for, the components are to comply with the foregoing requirements and are to be mounted in approved metal casings. All switch toggles are to be protected. Where flush conduit work is required, the industrial units are to be semi-recessed up to the back of the cover section. Care is to be taken that the boxes are adjusted to suit the finished plaster work and close co-operation with the plasterer is necessary to achieve an acceptable result.

Flush switches shall be mounted vertically in standard hot dip galvanized mild steel boxes 100mm x 50mm x 50mm complying with SABS 1085, socket outlets being in standard 100mm x 100mm x 50mm boxes, unless otherwise specified or approved. Attention is drawn to the Clause "Wiring in Conduit" elsewhere in this Part with regard to the configuration required for multiple switches on the same or different circuits.

Up to three switches in a vertically mounted 100mm x 50mm x 50mm box will be acceptable if designed for such mounting. The Contractor is to ensure that the Plasterer covers right to the edge of various boxes since gaps between plates and plaster will not be accepted, and it is deemed the Contractor's responsibility to ensure that no such gaps are visible.

Switches shall be mounted at 1400mm, socket outlets at 350mm above finished floor level, except in hospitals where socket outlets shall be at 450mm, unless otherwise specified.

Where shown adjacent to walls on the same wall as the doors, switches shall be situated with the centre line between 125mm and 230mm from the edge of door frames except where wall nibs are smaller than 250mm wide, in which case they shall be positioned centrally. Heights above finished floor are taken to the underside of rectangular boxes or to the centre of circular boxes. The scaled dimensions to the centre of the symbol are to be taken as the centre of the outlet in the absence of specified dimensions on the drawings.

34. LIGHT FITTINGS

34.1 General

Allowance shall be made for the supply and installation of light fittings as specified elsewhere in this Specification with the exception of those fittings for which PC Sums are allowed. Allowance for the installation only of these PC fittings shall be made.

Each incandescent fitting shall be supplied with a gas filled pearl or opal lamp of the wattage specified on the drawings complying with SABS 56 and Compulsory Specification VC 8043. Allowance shall also be made for appropriate lamps for mercury or sodium fittings. The size of each fitting must suit the wattage of the lamp specified. In the case of PC fittings, these will be supplied with lamps.

Fittings to be installed at each point are detailed on the drawings according to the code types set out elsewhere in this Specification. Supply of fittings marked PC is covered by a PC amount in the Price Summary. Catalogue numbers refer to fitting type only, not necessarily to size, which is to suit the wattage shown.

Fittings shall be directly fixed to ceiling or structure in addition to being fixed to the conduit box.

34.2 Fluorescent Fittings

Fluorescent fittings and their components shall comply with all the SABS Specifications relating to them.

Bodies are to be constructed of cold rolled sheet steel, bonderized or similarly treated for the inhibition of rust, treated with anti-corrosion undercoats of paint followed by high quality white baked enamel. No patched up scores or other damage to enamelling will be accepted. Nuts, screws, washers, etc., are to be non-ferrous or plated to prevent rusting. No equipment is to be riveted to the bodywork, all equipment being easily removable. The back plate is to be free of all protruding screw heads. All such screws are to be countersunk headed.

Recessed fittings shall be provided with a raceway cover over control gear, thus preventing control gear from accidentally falling onto the diffuser. Capacitors used in such fittings shall be so manufactured that in the event of failure, they do not present a fire hazard.

Fluorescent fittings are to be removable and not held in position by bolts shot through the back plate. If this system is used, the fittings will have to be removed and remounted at the Contractor's expense.

The fittings are to be wired throughout and wiring brought to terminal strips or connectors close to the conduit entry. Each of the incoming terminals shall be large enough to accommodate two 1,5mm² wires without difficulty.

Lamp holders are to be mounted on rigid material and so spaced apart that any natural expansion of the lamp will not exert horizontal forces on the holder. Each fitting is to be supplied with 3500 K white tubes, unless otherwise specified.

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Low loss, high power factor ballasts approved by SABS tested in accordance with Section 7 of SABS 890, or ballasts which at least provide the minimum values laid down by the SABS shall be employed. Ballasts shall be of best quality self-contained metal clad type, suitable for operation on 220/250V 50Hz supplies. The voltage rating at each tap of the ballast terminal block shall be clearly and indelibly marked. Ballasts are to be silent in operation and shall be power factor corrected to not less than 0,9 lagging. Multi lamp fittings shall be stroboscopically corrected. Operation shall not cause radio or television interference.

Where ballasts bearing the SABS Mark of approval are available for a particular type of lamp and associated circuit, ballasts of that category which do not bear the Mark will not be accepted.

35. MISCELLANEOUS ELECTRICAL CONNECTIONS

Connections shall be made to all electrical equipment as detailed elsewhere in this Specification. The following provisions shall apply in general.

Control panels supplied by others will be installed by them and will be complete with an integral main isolator. This Contract covers the connecting of the main supply and cable gland. Wiring from control panels to equipment is a part of this Contract, unless otherwise specified.

All motors shall be provided with an adjacent isolator where indicated on the drawings. This isolator is to be mounted on a suitable floor stand if it is not possible or practical to mount it on the machine. Final conduit connections to motors are to be through flexible conduit as specified elsewhere in this Part, or alternatively with PVCAS cable.

Domestic stoves shall be connected in accordance with the recommended method of the local Supply Authority for the particular area. A 1,5m length of flexible conduit as specified elsewhere in this Part shall be allowed for the final connection between the outlets and stove. Allowance shall be made for connecting all stoves unless otherwise specified elsewhere in this Specification.

In cold rooms the light circuit shall preferably be wired in "Surfix" but if PVC insulated wire is used, this shall be in galvanized conduit directly secured to the fitting.

The point of entry shall be silicon sealed. Any thermostats, fan or other connections to be made within the cold room as specified elsewhere in this Specification, are to be made using "Surfix" run along the same general route as the refrigeration pipes and sealed as above.

36. HOT DIP GALVANISING

Where hot dip galvanising is called for, it shall conform to SABS 763, the required coating thickness being in accordance with Table 1.

Unless the galvanized part is to be painted, the coating is to be passivized immediately. Where later painting is required, a suitable primer shall be applied at the galvanising works.

Before galvanising, all cutting, drilling, welding, etc., shall be complete. Bolt threads shall be suitably undercut and nut threads over tapped to ensure the correct fit after galvanising.

All galvanized parts shall be stored under cover and in stacks such that no part is resting on another and there is sufficient ventilation to prevent condensation occurring. No galvanized parts shall be stored directly on the ground but on pallets or similar protection. Any damaged parts or parts attacked by white rust will be rejected.

Any galvanized surface that is subsequently damaged shall, if the Engineer does not require replacement, be touched up in the manner specified in the Clause "Painting" elsewhere in this Part.

37. PAINTING

Any metal work which is not galvanized or painted at Works shall be decreased using a solvent and thoroughly cleaned with a wire brush. If rust is present, this shall be removed by grinding. A red oxide self-etching primer shall be applied, followed by a white undercoat and thereafter a coat comprising a mixture of 50% undercoat and 50% finishing coat. The final coat shall comprise oil based outdoor type enamel.

All equipment that is delivered to site painted shall, after installation and as near as possible to handover, be lightly rubbed down, all damaged paintwork shall be touched up and thereafter the whole given one coat of oil based outdoor type enamel of the same colour as the original.

Where any galvanized or zinc coated surface has been damaged or cut, this shall be touched up using an organic zinc rich epoxy primer (containing min. 90% zinc) after thorough cleaning with a solvent and grinding away all rust.

This is to be followed by a self-etching primer suitable for use on zinc coated surfaces and then an undercoat and two topcoats as described above.

38. LABELS AND NOTICES

The Contractor shall arrange for the labelling of all equipment, instruments, meters, relays, cables, etc., as indicated below.

Where identical items of equipment can be removed from their housings, e.g. circuit breaker carriages, plug-in relays etc., both the fixed and with draw-able portions are to be labelled identically.

All labels shall be ivory or other back engraved white on black labels of the sizes indicated. They are to be located in purpose made holders or otherwise are to be screwed or riveted into position. "Dymo" tape or similar labels will not be accepted nor will labels which are glued in position only.

Labels on poles shall comprise an aluminium plate with the designated number. These labels shall be nailed to the pole 1,5m above ground level. Nails shall be electro-galvanized clout nails.

Prior to any equipment being labelled, the Contractor shall request the Engineer to provide a complete labelling schedule for all items of equipment. Under no circumstances is equipment to be labelled in accordance with the tender drawings since any description thereon is for identification purposes during construction only and is unlikely to apply to the completed Works.

The following list indicates the general labelling requirements but does not limit the extent of labelling required, which shall encompass the full extent of the equipment supplied, or in the case of existing equipment, any such which is affected by this Contract.

- 50mm high lettering:
 - Substation and mini-sub designation.
 - Outdoor switchgear designation.
 - Transformer designation.
 - Distribution kiosk and fused feeder panel designation.
- 20mm high lettering:
 - Main or sub-main board designation.
 - Control panel designation.
 - Indoor switchgear designation.
- 10mm high lettering:
 - Individual switches on switchgear.
 - Cubicles.
 - Sub-distribution board designation.
 - Poles for OH lines.
- 5mm high lettering:
 - Minisub feeder breakers and isolators.
 - Distribution kiosk feeder breakers and isolators.
 - General distribution switchgear.
 - Meters, instruments and relays.
 - Multiplying factors.
- 3mm high lettering:
 - This size shall be used to designate the conductor size and number of cores of each cable installed under this Contract. In addition, all feeder cables shall be labelled to state from whence they are fed.

All switchboards shall be provided with a label in both official languages reading "In case of leakage or accidental contact, put off main switch immediately".

All substations, mini-sub, kiosks, transformer rooms and switch rooms shall be provided with notices as required by the Occupational Health and Safety Act. All doors to such locations shall be fitted with the appropriate notices. In the case of mini-sub, these shall comprise at least two 190mm x 190mm design WW7 in accordance with SABS 1186 externally and Hv/s and Lv/S respectively on the inside of all doors, while kiosk doors shall meet the LV requirements only.

For all other substations, enclosures etc.: "Kontra" Safety Signs as supplied by Mine Safety Appliances or approved equivalent are to be provided, Nos.KM115 and K0711 being used externally and KM112, K0706 and K0710 internally.

Where more than one similar item of equipment is fed from the same board or control panel, the item itself shall be labelled, this being fixed in a permanent position, i.e. not attached to motors, pumps etc., but to bases or adjacent thereto. The lettering shall be 50mm high.

39. DISMANTLING

Where dismantling of existing parts of the installation is called for, all components including wire, insulators, poles, cable, switchgear, transformers, etc., are to be removed and handed to the appropriate Authority. Under no

circumstances is any material or equipment to be taken over by the Contractor. In the case of reclamation of conductor, this is to be done after removing the binding wires on intermediate insulators so that full strain lengths are recovered. All such material is to be neatly coiled, packed, etc., as appropriate.

Extreme care is to be taken in dismantling all such equipment, since it will be re-used by the Employer. If, in the opinion of the Engineer, unnecessary damage is done, the cost of replacing such equipment will be debited to the Contractor's account.

A receipt detailing all equipment and materials delivered in accordance with the above must be obtained and a copy submitted to the Engineer.

40. VENTILATION

40.1 General

Ventilation fans shall be in accordance with the Schedule of Fans and as detailed on the tender drawings. Fans shall deliver the specified air quantities against the system resistance. Where no pressure requirements are indicated Tenderers shall estimate the fan static pressure requirements for the system layout and equipment as offered by them and tender accordingly.

Fans shall be selected to operate at or as near to maximum efficiency as possible.

Flexible connections shall be fitted between fan inlet/discharge and ducting or equipment as appropriate. Flanges are required with flexible connections.

Fans shall be fitted with manufacturer's nameplates permanently fixed to the casing in a prominent position clearly indicating manufacturer, model number, maximum operating speed, maximum power absorbed, size and serial number for larger fans.

Air in/outlets not connected to ducting or equipment shall be properly protected with removable screens as per SABS 0400. Indicating arrows for both direction of rotation and direction of airflow shall be provided on fan casings.

Fan motors shall be suitable for single-phase 230 volt or 3 phase, 400 volt, 50 cycle electrical supply.

Fan motors shall be totally enclosed fan cooled and shall be suitable for star-delta starting if larger than 7,5kW. The motors shall have nameplate ratings of not less than 20%, or otherwise specified, above the actual fan power required at specified capacities and system resistance.

40.2 Centrifugal Fans

Centrifugal fans shall be of the forward or backward curved, multi-vane type with single or double inlet arrangement as specified in the Supplementary Specification.

Fan performance shall be based on tests carried out in accordance with BS 848: Part 1 or Part 3 (as applicable) and as amended.

The fan casing shall be of the volute type manufactured from sheet steel with lock forming or continuously welded seams, suitably reinforced and adequately supported by means of a steel superstructure.

Fan wheel and shaft assembly shall be statically and dynamically balanced to ISO 1940 – 1973 within grade G6,3.

Fan drives shall be by means of standard V-belt and grooved pulley configuration. Drive motors mounted on the fan casings are not acceptable.

Larger fans shall be manufactured with split casings in sections to permit installation through available openings in new and existing buildings.

Shaft bearings shall be grease lubricated, self-aligning ball or roller bearings in accordance with the fan manufacturer's standard practice. For bearings located in the air stream, precautions shall be taken to prevent loss of lubricant.

Shafts shall be fully machined steel shafting conforming to BS 970 grade 070M20.

A drain socket with plug shall be provided at the lowest point in the fan casing (except if discharge is at lowest point). Fans used in variable volume applications shall have stable characteristics throughout the operating range.

All fans shall be tested in the factory and checked for vibration to ISO 2372, smooth running, mechanical interference. Bearings shall be checked using a shock impulse meter.

Fan motors in the air stream in draw-through applications with spray coolers or sprayed coils shall be TEFC and protected to IP44 or better.

Casing access panels shall be fitted to fans 630mm and larger and all fans used in drawthrough applications with spray coolers or sprayed coils.

40.3 Axial Flow Fans

All fans shall be manufactured from heavy gauge mild sheet steel. The casings shall be roll formed and welded before being Hot dipped galvanised to BS729.

All axial fans shall be long case axial flow fans. Each fan shall be complete with matching flanges and feet.

The fan blades shall be manufactured from die cast aluminium to BS1490

All fan Hubs shall be manufactured from a die cast aluminium alloy.

Axial fans shall be installed with a suitable flexible connection between each side of the fan and the connecting ductwork.

Axial flow fans shall be supported on anti-vibration mountings to the written recommendation of the manufacturer. Suspended units shall generally be supported from hangers Type 30N as manufactured by Mason Industries Inc. or equal and approved.

Axial flow fans shall be of the aerofoil type with non-overloading characteristic with peak power requirements occurring in normal operating pressure range and motor rating exceeding this requirement.

Axial fans shall be selected for the highest possible efficiency with the lowest possible blade tip speed.

The complete fan unit shall be statically and dynamically balanced in accordance with ISO 1940 –1973 within grade G6,3.

Fan performance shall be based on tests carried out in accordance with BS 848 : Part 1 as amended.

Fan motors shall be totally enclosed squirrel cage induction type with protection to IP 55 unless for a special application as set out in the Supplementary Specification.

Motor connections shall be in a external weather proof terminal box forming part of the casing. (Except for flameproof and special applications.)

40.4 Propeller Fans

Propeller fans shall be suitable for plate mounting.

Mounting plates (diaphragm) shall be of pressed steel or reinforced laminated fibreglass with integral bell mouth orifice.

Impellers shall be of heavy gauge contoured pressed steel blades or reinforced polypropylene or fibreglass ultra-violet stabilised, mounted on cast aluminium or steel hubs.

Fan motors shall be three-phase totally enclosed squirrel cage induction type with protection to IP44.
Fans shall be resiliently mounted.

Motor and impeller protection screens shall be fitted as applicable.

Fans on exterior walls shall be fitted with weather tight galvanised wall cowls. Window/Wall Extract Fans

Window/wall type fans shall be fitted with automatic shutters.

Fans shall be fitted with finger protection guards.

Where specified, speed control shall be provided.

40.5 Roof Extract Fans

Roof extract fans shall be the mixed flow or propeller type as specified in the Supplementary Specification with non-overloading characteristic.

Where specified, units shall be suitable for upstand or curb mounting complete with weather skirt and flashing as required.

Vertical discharge fans shall be fitted with shutters to prevent rain ingress.

Roof extract units shall be suitable for mounting on the roof pitch.

Roof extract units shall be manufactured from reinforced fibreglass and painted as specified.

Fans shall be directly driven by totally enclosed airstream rated motors protected to IP44.

Fan performance shall be based on tests carried out in accordance with BS 848: Part 1 (as amended).

Impellers shall be statically and dynamically balanced.

41. DUCTING

41.1 General

All ducting shall be low velocity low-pressure ductwork and be manufactured from galvanised sheet metal to SABS 1238-1979 as amended.

Site Dimensions

The Mechanical Contractor is required to check all dimensions on site before preparing drawings for the manufacture of ductwork and will be held responsible for ensuring that all ductwork conforms to the building structure.

All ducting will be installed neatly, and all duct joints and seams shall be airtight.

The types of longitudinal seams, transverse joints, and duct stiffening shall be in accordance with the relevant tables and sub-sections of the SABS specification. Ductwork is to be true in section. No distortion shall be permitted.

Ductwork supports are to be galvanised, adjustable, of adequate strength and in accordance with SABS 10173. Pop rivets, etc. penetrating into vapour sealed insulation will not be allowed.

All ducting having a semi-perimeter of 1150 mm or more shall be flanged using Ductlok flanges and fasteners incorporating a permanent non-hardening sealant. Should Mezz Flanges be used, then sufficient sealant and fasteners shall be used to ensure that no air leakage occurs.

All material thickness SHALL be in accordance with the specification. The cost of replacing any defective ductwork and any associated builders work will be for the contractors account if lighter gauge material is used.

All ducting will be sufficiently supported to ensure no stress or strain is imposed on the ducting joints and seams. The cutting of drive slips or flanges to accommodate branch ducts is not acceptable.

41.2 Insulation

All air conditioning ducting is to be insulated as detailed in the Project Specification. No ducting shall be accepted with torn insulation.

Ventilation ducting need not be insulated.

Allowance must be made for a flexible connection on each connection to equipment. A minimum of 50 mm separation between metal edges shall be maintained.

All bends installed on the main supply air duct connections from the units shall have double thickness turning vanes.

Where changes in duct sizes indicated are necessitated on site, duct sizes shall be determined using equivalent diameters (hydraulic diameter) and not cross-sectional area.

Flexible joints shall be provided between all fans, air handlers, vibration inducing equipment, etc. and ducting.

Flexible joints exposed to weather shall be provided with protecting galvanised sheet steel cover strips.

Flexible connections shall be made of fireproof fabric reinforced airtight material attached both sides with approved galvanised steel collars or frames.

41.3 Flexible Ducting

Flexible ducting shall be Euroflex type Isodec 25A aluminium/polyester/aluminium laminate with a heavy-duty steel helix core. The flexible duct shall be insulated with fibreglass insulation having a density of 16 kg / cubic metre.

The outer jacket vapour barrier shall be made of spirally reinforced multiple layer aluminium laminated construction. No tight turns with the flexible ducting will be accepted and the maximum length of any flexible duct will be 1500 mm.

Should the engineer not be satisfied with the installation of the ducting he shall reserve the right to call for an air leakage test. The test shall be in accordance with SABS 10173 and the contractor shall supply all necessary measuring apparatus and conduct the test in the presence of the engineer.

The contractor will carry out any remedial work deemed necessary by the engineer to meet the necessary air leakage standards free of charge.

Care is to be taken with the installation of any second fix ducting through ceiling grids. Any damage caused to the ceiling grid or tiles shall be rectified free of charge by the contractor.

All ducting is to be kept dust free during and after installation. The contractor is to allow for sufficient plastic sheeting covering all openings, attenuators, and grilles to avoid dust getting into the ducting prior to commissioning.

All hangers are to be level and perpendicular to the ceiling and ducting. All marks writing etc are to be removed by the contractor prior to handover.

Flexible ducting shall comply with local fire codes, NFPA Bulletin 90A and SABS 0400 fire resistance requirements.

41.4 Test Holes

Test holes shall have galvanised steel cover plates secured with stainless steel screws. Any cut edges around holes etc, and wherever galvanising is broken shall be painted with 'Galvanite'.

41.5 Exposed Ducts

Ductwork exposed to the weather shall not be less than 1mm material thickness and shall be painted to an approved colour.

41.6 Balancing Dampers

All balancing dampers shall be gear driven opposed aerofoil blade dampers mounted between two flanges and be complete with a lockable quadrant. Dampers shall be manufactured from galvanised sheet metal which shall have a thickness not less than the duct gauge fixed to each side. Dampers shall be Similar or equal to Europair DMP.

41.7 Fire Dampers

Fire dampers shall be provided at all positions where ducts pass through a firebreak barrier. These shall have a fire resistance equal to that of the barrier, and shall be equipped with fusible links to operate at 59 degrees Celsius.

Access traps shall be provided in the ductwork to permit inspection and replacement of the link.

42. ROOM AIRCONDITIONING UNIT

42.1 General

Room type air conditioners shall be self-contained units of the direct expansion unitary or air covered split type design.

The air conditioners shall generally be in accordance with SABS 1125-1977 with sound levels not exceeding the values specified in the project specification.

42.2 Console Units

The Contractor shall supply and install room air conditioners as indicated on the drawings and in the schedules.

Each unit is to be of a current catalogued modern design.

All external parts exposed to the weather shall be coated with Tectyl or equal and approved.

Console units shall be supplied with natural anodised external aluminium weather grilles.

Cabinets are to be fully insulated to prevent excessive noise being transmitted and surface condensation occurring.

Capacities shall be as indicated on the drawings, at the design conditions.

Each unit shall be supplied with a permanent type of washable filter.

Each unit will be equipped with a variable position thermostat, high, low and medium speed fan control and damper control or room and fresh air quantities.

Power supply will be 230 volts, 50 hertz, and single phase. A double pole 15amp isolator will be provided within 2 metres of the position of the units by others. The successful tenderer shall carry out the wiring between each unit and its respective isolator.

Tenderers are to state clearly any discrepancies between the guarantee of these units and those required under the general conditions of contract

Units shall be provided with suitable cradles, sleeves, sealing strips and brackets in order to support the units and prevent undue vibration.

Units shall be installed so that they may be easily removed for maintenance purposes and installation is to be completely weatherproof.

Units shall be mounted using maker's mounting points and using materials to ensure that galvanic action does not take place. Close fitting, knot-free, wooden varnished architraves are to be fitted on the outside of each unit to ensure a neat finish. Architraves shall be 75 mm x 20 mm meranti timber.

42.3 Ceiling Cassette Split Units

Each unit shall consist of an air-handling unit with a separate matching condensing unit from the same manufacturer.

All ceiling cassettes shall be similar or equal to Daikin Model FHYC.

Each machine is to be complete with a hard-wired type remote controllers.

The unit is to incorporate a high efficiency filter, which is to be easily accessible for cleaning and maintenance purposes.

The indoor unit is to incorporate an aerodynamically designed impellor and is to have an exceptionally quiet operation with a maximum of 42db sound power level.

Each evaporator is to be complete with a 4-way uniform decorative panel to ensure even air distribution.

Each machine is to be complete with a temperature controller with a self-diagnostic microcomputer that continuously monitors the operating status of the indoor and outdoor units. The controller is to include for a low gas charge detector, be able to select high and low Fan speeds have a Filter cleaning icon displayed on the remote controller when its time to clean filters. The angle of the discharge blades is to be electronically controllable.

The machine is to be provided with Auto restart that automatically restarts the unit in the previous mode after power is restored following a power failure.

Each machine is to be provided with a high lift water drain pump.

The condensing unit is to be complete with scroll compressors and incorporate High static pressure fans.

The coils are to be copper tubes with aluminium fins and are to be treated with a special acryl coating. (PE fin)

42.4 Air Cooled Ducted Splits (<17.5kW)

Each unit shall consist of an air-handling unit with a separate matching condensing unit from the same manufacturer.

Each machine is to be complete with hard-wired type remote controllers.

Each machine is to be complete with a temperature controller with a self-diagnostic microcomputer that continuously monitors the operating status of the indoor and outdoor units. The controller is to be complete with the following functions:

- Auto Operation Mode
- Fan Operation Mode Change
- Emergency Operation Function
- Auto Restart Function
- Anti –Ice Function on Indoor Coil
- Low Voltage Detection Function
- Random Start Function
- Filter Alarm Function
- Sensor Fail Function
- Cycle Fail Detection Function

The condensing unit is to have an extremely quiet operation and high efficiency compressors and incorporate High static pressure fans.

The coils are to be copper tubes with aluminium fins and are to be treated with a special anti corrosive coating.

All condensing unit coils shall be pre treated with an anti-corrosion treatment similar or equal to Heresite or Coil guard and the whole casing is to be treated with tectyl before installation.

42.5 Under Ceiling Split Type Units

Each unit shall consist of a direct expansion indoor fan coil unit and a separate remote externally located air cooled condensing unit.

The indoor fan coil unit shall be under ceiling mounted. When the unit is installed below a false ceiling the unit is to be recessed into the ceiling tiles.

Remote controls shall be either hard wired in conduit and mounted at the same height as the light switches or be of the infra-red type remote.

All refrigeration piping shall be installed as elsewhere detailed in this specification.

The external condensing units are to be mounted either on galvanised wall brackets or onto a concrete base.

Condensing units' positions on concrete bases must be seated on rubber anti-vibration mounts.

43. FIRE DETECTION AND PREVENTION SYSTEMS

The fire detection system shall comprise fire detection devices located throughout the building. The system will consist of smoke detectors in the factory area and heat detector in the kitchen together with break glass units and sirens at each exit shall be installed.

The power supply for these devices is via 24V dc. In the event of a failure of the 24V dc supply there shall be an automatic switch over to the stand-by battery supply without an interruption of the load and without activating a fire alarm.

The existing mimic panel will be upgraded to accommodate the cheese factory fire detection. No new control system will be installed.

The building will be designed and equipped in accordance with the requirements for fire protection systems laid down in SABS 10400, and in accordance with Local Authority requirements. The fire design will take cognizance of aspects such as escape routes, hose reels and fire extinguishers, external fire hydrants and sprinklers.

- It shall be the tenant's responsibility to ensure compliance with SABS 10400 in respect of equipment and storage layout and arrangement. The standard related to fire protection will be designed for a Moderate or Low Risk (D2 or D3) occupancy as defined in SABS 10400. The occupancy and usage of the building by the tenant will be restricted to the above by the Local Authority in accordance with SABS 10400 unless additional fire protection measures are provided by the tenant.
- Sprinkler Systems will be required.
- Sprinkler systems and the water supply thereto will normally be designed for a maximum storage height with protection by roof or ceiling level sprinklers as described in Table 2 of SABS 0287: 2000. However, all sprinkler requirements will be waived by the local fire department if the tenant provides a motivation that the production will be of a low fire hazard.
- The Sprinkler Installation allowed for will feed from the existing building at milk production and no separate system installation for the sprinkler control will be done.
- A fire plan will be developed and provided to the tenant.
- Directional exit signage in building area will be provided leading to all fire exit doors in case of emergency.
- Fire extinguishers will be provided in the building area.

44. DRAWINGS

44.1 Tender Drawings

The Drawings accompanying this specification shall be deemed to indicate the general layout of the systems and are not to be used as shop drawings. All dimensions are to be checked on site before manufacture.

44.2 Drawings to be supplied by Contractor

The successful contractor shall within two weeks of notification of award of this contract submit all necessary builders work drawings showing all necessary holes, chases etc. to the engineer for approval.

The Contractor shall supply plant foundation drawings showing the position and dimensions of plinths required together with details of anti-vibration material, foundation bolt holes, to allow the Builder to have this work prepared in time to receive the plant.

The contractor will then proceed to produce and co-ordinate all necessary working drawings of all the services included in this contract.

Three copies of all drawings shall be submitted by the contractor to the engineer for approval before ordering any plant or machinery required for the contract or before any work commences.

Prior to the preparation of the co-coordinated working drawings, the Contractor shall liaise with other Contractors as directed by the Builder to ensure that due consideration of other services is taken into account.

The Contractor shall allow for preparing such drawings sufficiently in advance to give the respective parties adequate time for approval of drawings, and to suit the Builder's programme.

The Engineer's approval of drawings submitted by the Contractor shall not in any way relieve the Contractor from his responsibility in respect of the accuracy of all such drawings or from his responsibility to provide equipment suitable in dimension, construction and finish for the location in which it is to be installed.

Any modification or amendments to these drawings requested by the Engineer in order to ensure that they fulfil the contract conditions shall not involve the employer in extra expenditure.

All alterations to working drawings, whether due to co-ordination or otherwise, shall be carried out by the Contractor and, after final approval has been obtained, the Contractor shall make final issue to all parties concerned with 3 copies to the Engineer.

Any work caused by inaccuracy of marking out or other default of the Contractor shall be paid for by the Contractor, such unnecessary work may include repairing, replacing, making good, taking down and rebuilding of any part of the building plant and other as may be affected by such work.

Any unnecessary work carried out by the Builder adjudged by the Engineer or Architect to be caused by inaccuracy of marking out or other default of the contractor, shall be paid for by the contractor.

All detailed drawings submitted for approval shall be produced to be compatible with AutoCAD or equivalent computing package. Drawings are to be drawn to a reasonable scale, and the Engineers decision as to what constitutes a reasonable scale shall be final.

Detailed drawings shall be regarded as correct where they differ from the general arrangement drawings. A graphical scale shall be incorporated on all drawings.

44.3 Untimely Submission of Drawings

Any extra expense incurred due to any addition and/or amendment made by the Contractor after the drawings mentioned above have been submitted or due to the untimely submission of drawings, shall be for the Contractor's account.

It shall be binding upon the Contractor to establish with or obtain from the builder the scheduled time of commencement and programming of all building work affecting the Contractor in respect of this clause.

44.4 Final Drawings

The Contractor shall furnish the Engineer (for onward transmission to the Employer) with two sets of drawings of the plant as finally completed, incorporating all variations made during the course of construction.

Such drawings shall be submitted no later than two weeks after the completion of the contract works. Once accepted the contractor shall furnish an electronic copy of all drawings for record purposes. The electronic copies shall conform to SABS 0400 and shall be compatible to the latest AutoCAD computing package.

45. MAINTENANCE AND SERVICING

The contractor shall be responsible for all maintenance and servicing of the Installation for the full 12-month maintenance and guarantee period following the hand over date. During this period, the contractor shall make good any defects due to inferior materials and workmanship and maintain all plant and equipment in perfect operating condition.

During the twelve-month maintenance period the contractor is to carry out the specified number of services and at the end of the warranty period he is to rectify all defects and bring the equipment to an as new level.

The contractor shall be responsible for the servicing of all components of the Installation in accordance with the manufacturer's instructions at the end of the one years guarantee and Maintenance period.

For this purpose, the contractor shall prepare a detailed inspection and service report in the form of a checklist showing all functions to be carried out at each service. Copies of this service report are to be submitted to the Company's authorised representative after the service. The detailed service report shall be signed by the officer in charge of the installation. Unsigned service reports will not be accepted.

Breakdowns or complaints about any malfunctioning of the installation will be reported to the Contractor. It is the responsibility of the contractor to respond promptly on all such call outs, to repair the installation in the shortest possible time and to submit a signed breakdown report to the Company's authorized representative.

The contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, cleaning materials, etc.

Should the contractor fail to maintain the installation in a satisfactory working condition during the guarantee period, the Client may decide to extend the guarantee period and the requirements of this specification shall apply to such an extended guarantee period or may alternatively decide to call in the services of another contractor for this maintenance and servicing at the expense of the original contractor to the end of effective servicing period.

No worker shall service a refrigeration or air-conditioning appliance that uses CFC's or HCFC's refrigerant if such a worker does not make use of recovery equipment for the recovery of the refrigerant for recycling purposes.

Should a different refrigerant be substituted for that provided by the manufacturer, all name plates, drawings, and operating manuals shall be amended to show the new refrigerant name.

The contractor shall ensure that he complies with SABS 0147 and the Montreal Protocol when working on any Refrigerant or air-conditioning appliances that use CFC or HCFC refrigerant or that use refrigerant mixtures that contain CFC or HCFC. Any refrigeration equipment, which is to be serviced or repaired shall first be checked for refrigerant leaks and shall not be charged with new or recycled refrigerant that contains CFC or HCFC until all leaks have been repaired. Upon completion of the repair or service that equipment shall be rechecked for refrigerant leaks, and should any be found, the procedure should be repeated until no leaks can be detected.

46. HANDOVER

After completion of the commissioning the contractor is to submit all test results to the Engineer for checking and approval. The Engineer will check all commissioning figures and prepare a final defect list for completion. Once the snag list is completed to the Engineers satisfaction the system will be accepted and the maintenance period commence.

47. STAFF TRAINING

The contractor shall be responsible for the training of the Company's site staff after the commissioning has been completed. The site staff must receive enough instructions to ensure that they are fully conversant with the equipment concerned. Site staff shall be instructed on:

- The general operating method of the plant
- Starting and stopping instructions
- Stopping the plant or unit in emergency and warning against restarting after an emergency unless a competent person is present.
- Positions and normal settings of control equipment.

48. INSPECTION, TESTING AND COMMISSIONING

The Engineer shall have access at all reasonable times to such parts of the Works or the Contractor's premises or the premises of the manufacturer of component parts; as may be necessary for the purpose of inspecting, examining, and testing the materials, workmanship and performance of any plant or equipment specified for the Works.

The Contractor shall ensure that all equipment such as switchboards, transformers, minisubs, kiosks, etc., are inspected and tested at the manufacturer's premises, in the presence of the Engineer.

All wiring is to be subjected to a test voltage of 2kV for one minute without insulation failure. A Megger test is to be applied with a 500V instrument immediately thereafter to prove the insulation resistance better than 20 mega ohms. All meters are to be injection tested to ensure correct operation. All control circuits including motor overloads, relays, etc., are to be operated to ensure the correct functioning of the entire control system.

All equipment necessary to enable the tests to be carried out shall be provided and shall include, inter alia:

- Phase rotation meter : 500A primary injection test set
- Avometer : 25A secondary injection test set
- 500V : 2kV DC test set

After completion of manufacture, the following test certificates, signed by the Contractor and the firm executing the tests, shall be provided in duplicate:

- Transformer test certificate to SABS.
- Test certificate stating that all LV switchboards and control boards have been inspected and their wiring subjected to 2000V DC for 1 minute.
- Test certificate stating that all HV switchboards have been inspected and their internal wiring subjected to 2000V DC for 1 minute and HV components to the appropriate voltage as laid down in the applicable SABS or BS Specification.
- Any other test certificate for routine tests as laid down in relevant SABS or BS Specification or Codes of Practice applicable to the item in question.
- Test certificate in respect of any special tests called for elsewhere herein.

The Contractor shall arrange for any Statutory Government and/or Supply Authority inspection of the installation prior to testing and final commissioning by the Engineer.

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer, commissioning shall be carried out by the Contractor, and any tests the Engineer deems necessary shall be conducted. The Contractor shall supply all equipment necessary for the testing and commissioning procedures.

Prior to commissioning of any transformer, the oil shall be tested and, if necessary, shall be dried out by the Contractor. Should this be necessary, the Engineer must be advised that it is suspected the transformer is damp before any work is undertaken.

Transformer wheels shall be solidly chocked. No transformer shall be commissioned without the consent of the Engineer.

During commissioning, all tap change switches are to be correctly set and locked. All wedges and packing in switches and relays shall be removed and each switch and each relay circuit operated.

All protection and small wiring shall be tested with a 500V Megger and injection currents passed through the secondary's of every circuit to check the proper operation of relays, instruments, and protection.

The Contractor shall supply all equipment necessary for the testing and commissioning procedures. The test equipment required at Site shall include, inter alia:

- Phase rotation meter
- Suitable cable test set
- 11 000V phasing sticks
- 500V Megger

- Signature of the 5 000V Megger
- Avometer
- Earth resistance test set
- 25A secondary injection test set

After completion of the commissioning tests the Contractor shall provide duplicate test certificates relating to cable tests, current injection tests of all instruments, meters and relays and results of earth mat tests.

The Contractor shall give the Engineer at least 14 days' notice of the date of any testing or commissioning so that he may be present if he so wishes. Where the Engineer does not himself, or through his representative, attend to witness the tests, then the Contractor may proceed with the test, duly forwarding to the Engineer certified copies of the results obtained. In such cases, the test shall be deemed to have been made in the presence of the Engineer.

In the event of the equipment or installation not passing the tests, the Employer shall be at liberty to deduct from the Contract Price, all reasonable expense incurred by him or by the Engineer in repeating the tests.

49. OPERATING INSTRUCTIONS

The contractor shall prepare and supply Operating and Maintenance Manuals for the successful operation and maintenance of the installation. A draft copy of the manual shall be submitted after commissioning for approval. The draft copy shall then be corrected, and two sets of the manual shall be submitted before first acceptance of the plant will be taken.

These manuals shall contain the following information:

- Section 1 - System Description
- Section 2 - Operating Instructions
- Section 3 - Design Data
- Section 4 - Equipment Technical Information and Data
- Section 5 - Equipment Catalogues

- Section 6 - Maintenance Instructions
- Section 7 - Commissioning Data
- Section 8 - Drawings
- Section 9 - Acceptance Certificates

50. COMPLETION OF WORKS

Before completion of the Contract any damage which may have been done in the process of the installation shall be repaired and made good, trench or excavation work shall be left in a clean and tidy state and all accumulated debris shall be removed from the Site by the Contractor, to the satisfaction of the Employer and Engineer.

All defects found are to be rectified within one month of written notice of such defects. A penultimate certificate reducing the retention amount to that stated elsewhere in this Specification will only be issued upon submission of As Built Drawings and Operating Manuals as called for elsewhere herein, after completion of all notified defects, and once all test certificates called for in the Clause "Inspection, Testing and Commissioning" elsewhere in this Part have been submitted and accepted by the Engineer.

An appropriate Certificate shall acknowledge practical completion of the Works and the commencement of the period during which the Contractor will be responsible for any defects that may become apparent, and of Maintenance as detailed under the Clause

"Maintenance" in Section A of this Part, where applicable.

The Contract will not be deemed to be finally complete until the Engineer's final payment certificate is issued.

PARTICULAR SPECIFICATIONS

The following particular specifications are included:

- PA: Health & Safety Specifications

PARTICULAR SPECIFICATION: PA

PA HEALTH & SAFETY SPECIFICATIONS

The site-specific H & S Specifications, Appendix A will be issued as an Addendum

C3.5.1 MANAGEMENT OF THE WORKS

C3.5.1.1 Applicable SANS standards

As specified under Clause C3.4

C3.5.1.2 Particular / generic specifications

As specified under Clause C3.4

C3.5.1.3 Planning and Programming

Refer Clause 5.6 of the Conditions of Contract.

If the programme submitted by the Contractor in terms of Clause 5.6 of the Conditions of Contract has to be revised because the Contractor is falling behind in his programme, he shall submit a revised programme of how he intends to regain lost time to ensure completion of the Works within the period defined in Clauses 5.12 of the Conditions of Contract or within a granted extension of time.

Proposal to increase the tempo of work must incorporate positive steps to increase production either by more labour and plant on the Site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Employer's Agent to take steps as set out in Clause 9.2 of the Conditions of Contract.

The approval of a programme by the Employer's Agent shall have no contractual significance other than that the Employer's Agent will be satisfied if the work is carried out according to the programme. The said approval shall not limit the right of the Employer's Agent to instruct the Contractor to vary the programme if necessary.

C3.5.1.4 Sequence of the works

To be determined by the Contractor.

C3.5.1.5 Software application for programming

Not applicable.

C3.5.1.6 Methods and Procedures

The Works shall be executed in terms of the various and applicable specifications, the general health and safety specifications and subsequent health and safety plan, the Conditions of Contract as well as the various clauses within the Scope of Work.

C3.5.1.7 Quality plans and control

Refer the various and applicable specifications, the general health and safety specifications and subsequent health and safety plan, the Conditions of Contract as well as the various clauses within the Scope of Work.

C3.5.1.8 Environment

The Contractor shall, for the duration of the contract, take appropriate measures to control the dust and soil movement which may arise due to his operations.

C3.5.1.9 Accommodation of traffic on public roads occupied by the Contractor

The Contractor shall carry out, erect and maintain such temporary works and provide all temporary road signs, pipes, deviations, warning boards, barricades, signs, lighting and demarcations and the like, as are necessary to maintain and safeguard the normal flow of public and private vehicular and pedestrian traffic.

Work shall be undertaken in accordance with the S.A. Road Traffic Signs Manual and Road Signs Note No. 13, Roadwork (CSRA-CUTA Road Traffic Signs Sub-Committee).

C3.5.1.10 Recording of weather

Refer C3.4.10.

C3.5.1.11 Format of communications

All contractual communication shall be in writing.

The Contractor shall, for the full duration of the Contract Period, supply and maintain the following documentation:

- (a) Site Communication and Request Book.
- (b) Safety File containing all relevant safety data.
- (c) Daily register of all labour, plant and equipment.
- (d) Quality Control file containing all quality control/assurance forms and records.
- (e) Daily Register of labour and plant status.
- (f) One full set of Contract Drawings and documents.
- (g) Latest revision of the Construction Programme.

The above-mentioned shall be kept on Site and shall be accessible to the Employer's Agent at all times.

C3.5.1.12 Key personnel

Key personnel shall be on site at all times to control and supervise construction activities.

C3.5.1.13 Management meetings

The Contractor shall have regular site management meeting to coordinate and manage the Works.

Monthly Contract meeting shall be held on site. This meeting shall be chaired by the Employer's Agent.

C3.5.1.14 Forms for contract administration

The Employer, the Contractor and the Employer's Agent shall operate and maintain their own individual contract administration systems.

C3.5.1.15 Electronic payments

The Contractor must ensure that all interim payment certificates are accompanied by a Tax Invoice, with the Contractor's and the Employer's VAT Registration numbers printed thereon, to ensure timeous payment of the certificate. Contractors must allow 30 days from date of invoice for the payment to be effected.

Contractors wishing to be paid electronically must ensure that their correct banking details are also printed on their Tax Invoice.

C3.5.1.16 Daily records

A complete set of daily records indicating labour and plant on site, weather, work performed and any safety incidents, is to be kept on site and must be available for perusal by the Employer's Agent at all times.

C3.5.1.17 Bonds and guarantees

As specified elsewhere.

C3.5.1.18 Payment certificates

As specified elsewhere.

C3.5.1.19 Permits

Not applicable.

C3.5.1.20 Proof of compliance with the law

As specified elsewhere.

C3.5.1.21 Insurance provided by the employer

As specified elsewhere.

C3.5.1.22 “As built information”

As the work progresses, the Contractor shall keep full records of all amendments to and deviations from the drawings as issued to the Contractor at the start of the contract. The true positions, invert levels and ground levels of all services shall be surveyed after construction and indicated on the drawings, for which purpose the Contractor shall receive a separate complete set of drawings at no cost, from the Employer’s Agent. The Contractor must provide as-built survey information in digital format. In addition, the Contractor shall provide a copy of all quality control test results signed off by the Employer’s Agent as part of the as-built information submission.

C3.5.1.23 Testing

Process control

The Contractor shall arrange for all tests required for process control to be done by an accredited laboratory acceptable to and approved by the Employer’s Agent.

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

Acceptance control

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Employer’s Agent for acceptance control. However, before accepting any work, the Employer’s Agent may have further control tests carried out by a laboratory of his choice. The cost of such additional tests will be covered by a provisional sum provided in the schedule of quantities, but tests that failed to confirm compliance with the specifications, will be for the account of the Contractor.

C3.5.1.24 Management of EME’s/QSE’s

The monthly fee shall include full compensation for all guidance, mentoring, training, supervision, setting out and monitoring activities that may be deemed necessary to ensure the Works carried out by EME’s/QSE’s are in accordance with the technical and OHS specifications and within the agreed timeframes.

C3.5.1.25 Provisional Sum for the Variation in Rates

Works packages will be negotiated with the EMEs/QSEs and any variance in the Contractor's agreed rates and the EMEs/QSEs rates, both positive and negative will be set off under a provisional item included in the Preliminary and General section of the Bill of Quantities.

C3.5.2 HEALTH AND SAFETY

The Contractor shall comply with the Employers health and safety specifications as specified in Particular Specification PA.

C3.5.2.1 Health and safety requirements and procedures of the employer

- (a) In terms of the provisions of Section 37(2) of the Occupational Health and Safety Amendment Act, 1993 (Act 85 of 1993), hereinafter referred to as the Act, the following arrangements and procedures shall apply between the Contractor and the Employer to ensure compliance by the Contractor with the provisions of the Act:
- (i) The Contractor undertakes to acquaint the appropriate officials and employees of the Contractor with all relevant provisions of the Act and the Regulations promulgated in terms of the Act.
 - (ii) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and Regulations on the Contractor will be fully complied with.
 - (iii) The Contractor accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and Regulations and expressly absolves the Employer from himself being obliged to comply with any of the aforesaid duties, obligations and prohibitions, with the exception of such duties, obligations and prohibitions expressly assigned to the Employer in terms of the Act and its associated Regulations.
 - (iv) The Contractor agrees that any duly authorised officials of the Employer shall be entitled, although not obliged, to take such steps as may be necessary to monitor that the Contractor has conformed to his undertakings as described in paragraphs (i) and (ii) above, which steps may include, but will not be limited to, the right to inspect any appropriate site or premises occupied by the Contractor, or any appropriate records or safety plans held by the Contractor.
 - (v) The Contractor shall be obliged to report forthwith to the Employer and Employer's Agent any investigation, complaint or criminal charge which may arise as a consequence of the provisions of the Act and Regulations, pursuant to work performed in terms of this Contract, and shall, on written demand, provide full details in writing, to the Employer and Employer's Agent, of such investigation, complaint or criminal charge.
 - (vi) The Contractor shall furthermore, in compliance with Constructional Regulations 2014 (Notice No 10113, dated 7 February 2013) to the Act acquaint himself with the requirements of the Employer's health and safety specification as laid down in regulation 5(1)(b) of the Construction Regulation 2014, and prepare a suitably and sufficiently documented coherent site specific health and safety plan as contemplated in regulation 7(1)(a) of the Construction Regulation 2014 for approval by the Employer or his assigned agent. The Contractor's health and safety plan and risk assessment shall be submitted for approval, to the Employer or his agent, within 14 days of the Commencement Date and shall be implemented and maintained from the commencement of the Works. The Contractor shall at all times be responsible for full compliance with the approved plan as well as with the Construction Regulations and no extension of time will be considered for delays due to non-compliance with the abovementioned plan or regulations.
 - (vii) The Employer, or his assigned agent, reserves the right to conduct periodic audits, as contemplated in the Construction Regulations 2014, to monitor that the Contractor is compliant in respect of his obligations. Failure by the Contractor to comply with the requirements of these Regulations shall entitle the Employer's Agent, at the request of the Employer or his agent, to

suspend all or any part of the Works, with no recourse whatsoever by the Contractor for any damages incurred as a result of such suspension, until such time that the Employer or his agents are satisfied that the issues in which the Contractor has been in default have been rectified.

- (viii) The proposed type of work, materials to be used and potential hazards likely to be encountered on this Contract are detailed in the C3.4: Construction, the Bill of Quantities, the Drawings, and in the Employers' health and safety specification (regulation 5(1) of the Construction Regulations 2014).

Payment items are included in the Bill of Quantities to cover the Contractor's cost for compliance with the OHS Act and the abovementioned regulations.

C3.5.2.2 Protection of the public

The Contractor shall at all times ensure that his operations do not endanger any member of the public.

C3.5.2.3 Barricades and lighting

As specified elsewhere.

C3.5.2.4 Traffic control on roads

As specified elsewhere.

C3.5.2.5 Measures against disease and epidemics

As specified elsewhere.

C3.5.2.6 Aids awareness

Not applicable.

THE CONTRACT

PART 4 (OF 4): SITE INFORMATION

- C4.1** **Scope**
- C4.2** **Nature of ground and sub-soil conditions**
- C4.3** **Finishing-off of the Site**

C4.1 **SCOPE**

For the purposes of the Contract, it will be deemed that, prior to submitting his Tender, the Contractor has acquainted himself fully with the information and data provided within the specifications.

The Contractor shall have no claim against the Employer in respect of geotechnical or subsurface conditions encountered during the course of the Contract.

C4.2 **SUB-SOIL CONDITIONS**

No geotechnical investigation was done.

Material on site is expected to vary between sandy material and hard rock. The latter material should be excavatable by using an excavator however the use of a mechanical breaker is envisioned.

C4.3 **FINISHING-OFF OF THE SITE**

The site shall be finished-off in accordance with the specifications and to the satisfaction of the Employer's Agent.

APPENDIX A

HEALTH & SAFETY SPECIFICATIONS

An Addendum will be issued to all Tenderer.

APPENDIX B

TENDER DRAWINGS

List of Tender Drawings:

- AFR2163-GEN-GA-001-TEN-00 – GENERAL ARRANGEMENT
- AFR2163-GEN-GA-001-TEN-00 – GENERAL ARRANGEMENT: CROSS SECTION LAYOUT
- AFR2163-STR-DET-01-TEN-00 – PAVILION AND ABLUTION FACILITY DETAIL
- AFR2163-STR-DET-02-TEN-00 – CARETAKERS COTTAGE DETAIL
- AFR2163-EW-XS-01-TEN-00 – SOCCER / RUGBY FIELD CROSS SECTIONS: ACROSS FIELD LENGTH
- AFR2163-EW-XS-02-TEN-00 – SOCCER / RUGBY FIELD CROSS SECTIONS: ACROSS FIELD WIDTH